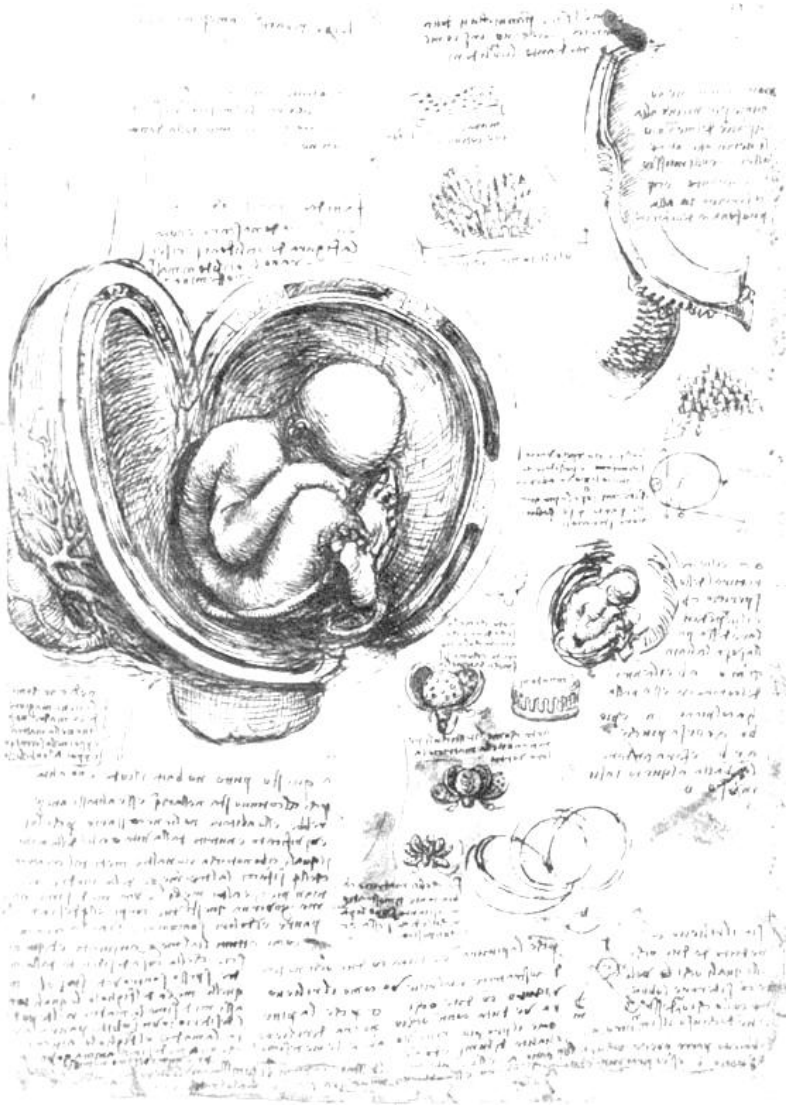
Volume XIX, Nr. 4, 2013, Timişoara, Romania
ISSN 2065-376X

MEDICINE IN EVOLUTION



CENTER OF PROMOTING HEALTH EDUCATION AND MOTIVATION FOR PREVENTION IN DENTISTRY
CENTER FOR CONTINUOUS MEDICAL EDUCATION

medicineinevolution.umft.ro

Journal edited with the support of

ROLF MARUHN
GERMAN CONSUL TO TIMISOARA

&

Printed at: WALDPRESS, Timisoara,
17 Brandusei Street,
Phone/Fax: 0040256422247

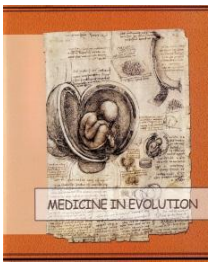
Edited at: EUROSTAMPA, Timisoara
26, Revolutiei 1989 Street,
Phone: 0040256204816

EDITORIAL BOARD

CONTENTS

ARTICLES

VISION OF ŞTEFAN ODOBLEJA ON PSYCHO-PHYSIOLOGICAL MECHANISMS INDUCED BY STRESS FACTORS/STRESS AGENTS



N.POPESCU[1], G.A.POPESCU[2]

[1]Individual Medical Practice dr. Popescu Nicolae, Drobeta Turnu-Severin
[2]Timisoara City Hospital, Surgery Department

ABSTRACT

The stress factor/stress agent is a conglomerate of heterogeneous stimuli (physical, chemical, biological, psychological) which interact with the human organism at various levels, the cause-effect conversion being made in the area of superior cognitive psychological proceses, with direct or indirect psychological effects, stress being thus triggered as a reaction of the organism with psychosomatic or somatopsychic effects according to the law of reversibility (retroaction, reverse connexion).

Key words: *skin stress factor/stress agent, reversibility law, psychosomatic/somatopsychic, consonantist psychology, resonance*

Correspondence to:

Nicolae Popescu
consultant in Family Medicine, doctor in medical science, Individual Medical Practice DR POPESCU NICOLAE
Address: Bdl. Carol I, 61, Drobeta Turnu-Severin, Mehedinți
Phone: +4 0722213910
E-mail address: npopescu_mf_kt@yahoo.com

INTRODUCTION

Stress factors (SF)/stress agents (SA), generally not alone but in multiple combinations in a situational configuration and by interacting with the subject in question, create a potentially stressful situation which disrupts psychological homeostasis (psychological balance).

The action of SF/SA is harmful when the subject in question responds at emotional level by anxiety and at initially cognitive level by adaptative response, and if new emotional reactions occur psychic stress may be reached.

A.Wells (11) underlines the fact that there is no theory or cognitive model of anxious disturbances, the author choosing the conception of A.T. Beck (3) where the term of cognition refers to an entire series of mechanisms upon which judgement processes rely, and to a certain point to the content of their product known as thoughts.

The basis of the cognitive theory of emotional disturbances is represented by the assumption acording to which disfunctions in this area occur and develop due to interpretations people give to etreme events. At the same time, behaviour responses resulting after such interpretations play, in their turn, a role in maintaining emotional disturbances (5).

Thus, thoughts may become veritable SF/SA, they may induce various types of stress (distress and eustress) a.n.

A.Ellis (4) considers that irrational beliefs represent the source of emotional and behavioural disturbances, these beliefs generating absolute requirements and requests, the latter being the basis for irrational cognition which is the source of emotional disturbances.

B. Arnold (2) thinks that *the intuitive assesemnt of a situation initiates a tendency to action which is experienced as an emotion and is expressed by various organic changes.*

R.S. Lazarus et al (7) were the first to show the importance of cognitive processes in the genesis of SP and described a general frame for the interaction between SA and the individual, capable to suggest that both the evaluation and reevaluation processes of the harmfulness of SF/SA, as well as the adaptative alternatives, have a major affective resonance.

Describing the dynamics of emotion, B. Arnold (1) identifies a succession of operations which might not reach the equivalent amplitute of a SP. These operations are usually run at the level of the subject's conscience and have the following sequence: perception of SF/SA, memory of similar experiences, reassessment of the situation, actual action.

The occurence of a SF/SA triggers a brain activation which causes a state of emotional tension, generating anxiety when the action persists without an adequate response, the *stress threshold* being thus reached. In this moment, the subject perceives the danger and is either task-oriented, seeking to solve the situation, or self-oriented, tending to maintain the initial psychological balance. Thus, in a first stage, an adaptative mobilization is recorded by improved performance, and during the second stage deteriorated responses occur due to decreased performances and the rigidity of adaptative acts characterised by the incapacity to capitalise previous experience, by the occurence of instability, suspicion, hostility. All these lead to a state of internal conflict described as *exhaustion threshold* characterised by fatigue, ineffectiveness, hopelessness, sense of guilt, in one word *depression* (6).

SF/SA have a global action before the response is elaborated (primary character) and another one during and after the response is triggered

(secondary character), both actions being based upon the principle of reverse connexion, described as influencing the system's state of reception to a new action or to the persistent action of a SA (6).

DISCUSSIONS

Law of reversibility (retroaction, reverse connexion) governs the entire work of St. Odobleja* „Consonantist Psychology"and his entire thinking, he being the one to detect the general character of feedback and to try to highlight it in the most variate processes and phenomena (10). In this work composed before 1938, probably between 1934-1937, we surprisingly identify in the chapters on static psychic (senses, reaction organs, memory), dynamic psychic, fundamental phenomena (excitations, sensations, reactions), affective phenomena, resemblances with the general adaptation syndrome (GAS) described by H. Selye, promoting original ideas, definitions, concepts, laws.

Thus, according to the conception of St.Odobleja, the excitations we may assimilate to SF/SA produce, through our senses, sensations which in their turn produce various reactions from the human organism such as adaptative and non-adaptative ones (fig.2).

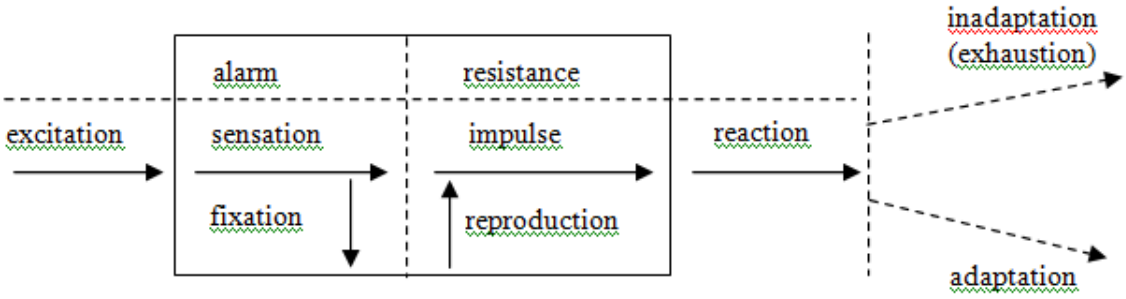


Figure 2. Possible reactions to SF/SA

Diagram adapted after: Dr. St. Odobleja, Psychologie Consonantiste, first volume, Libraire Maloine, Paris, 1938, p. 137.

Fig.2 - „sensation is the internal part of excitation, similarly to the impuls being the interior (psychic) portion of reaction. Fixation is a standstill while reproduction is a restart of the interrupted movement."

In this diagram, fixation (standstill) would be interpreted as an adaptation of the organism to the action of SF/SA, and reproduction and impulse would be the continuation of the action of SF/SA upon the organism, with psychic implications.

Together with physico-chemical excitants, St. Odobleja also considers psychic excitants (images, thoughts, defining senses as „... organs of sensations; providers of the psychic, of memory, the entrance gate to the psychic. Contact point for the physic and psychicological components"(cit.9).

For St. Odobleja the universe is a circle (fig. 3), and its two halves are represented by the physic and psychlogical components; „the physic is the source of the psychic and its last expression, its cause and often, its effect, the material of which the psychic is constructed"(cit.9). Quantitatively, he considers that physique is the largest portion of the universe, it is the „exterior, the periphery, the large sphere; the psychic is the interior, the centre, the smallest portion but the most important in each being's universe"(cit.9).

Figure 3. The universe seen by Şt.Odobleja; Source: op. cit., p.47

From dichotomous divisions which are in fact the basis for the author's conception, we may observe that the origin of excitants and reactions lies within the physique (8):

Transformable physique, pre-psychic, excitants;
Transformed physique, post-psychic, reactions and acts

SA/SF are originally either physico-chemical or they are psychlogical stimuli finally acting at psychic level where the impulse as a psychic phenomenon is produced which will trigger reactions belonging to the physiological area. At psychic level, affective phenomena St. Odobleja describes as concepts, intervene as an effect of external excitants' refraction through the concave lens of the organism's subjectivity, process during which the even and continuous course of external energies is suddenly deviated in different directions, thus generating the external poles of inconvenience and pain with pleasure situated betwen them. (v. fig.4)

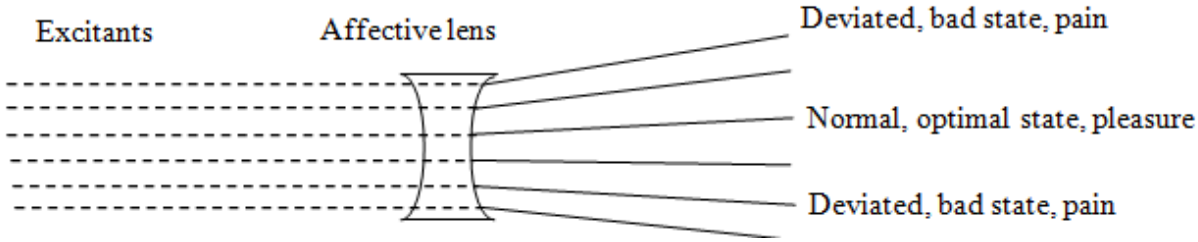


Figure 4. Affective lens; Source: op. cit., p.158

We may state without being mistaken that in his work, Şt. Odobleja originally describes the psycho-physiological mechanisms triggered in the organism by various external or internal stimuli, as well as the importance of the psychic in the adaptation or inadaptation processes of the organism to these stimuli.

Presently, the multiple reactions of the psycho-somatic system triggered by internal or external stimuli with different sources have been elucidated. The psycho-physiological unity of the human organism obliges us to regard stress rather as somatopsychic or psychosomatic, and we must avoid refering to somatic and/or psychic stress.

The information comming from inside or outside the organism influences the synthesis of pituitary neurohormones which will in their turn influence the secretion of peripheral hormones which will then act upon various tissues. Upon the assessment of the stressful character all the elements of the nervous system intervene (v. fig.5).

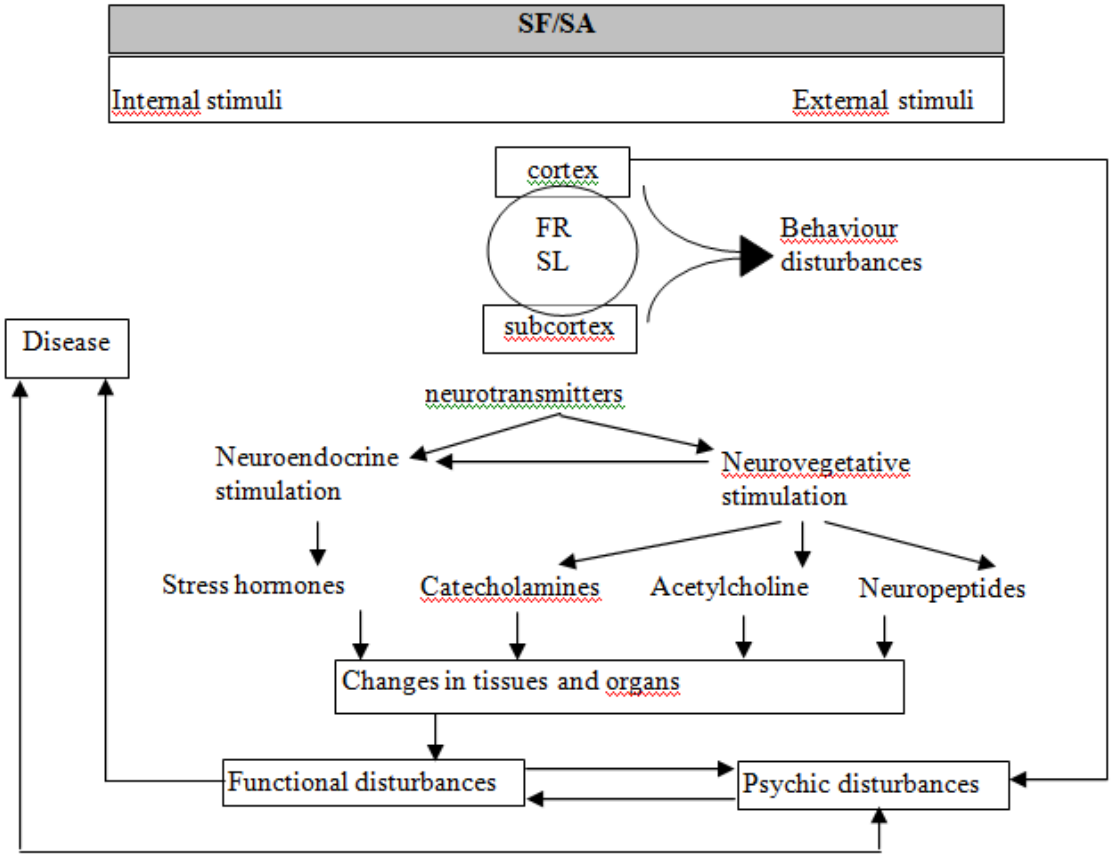
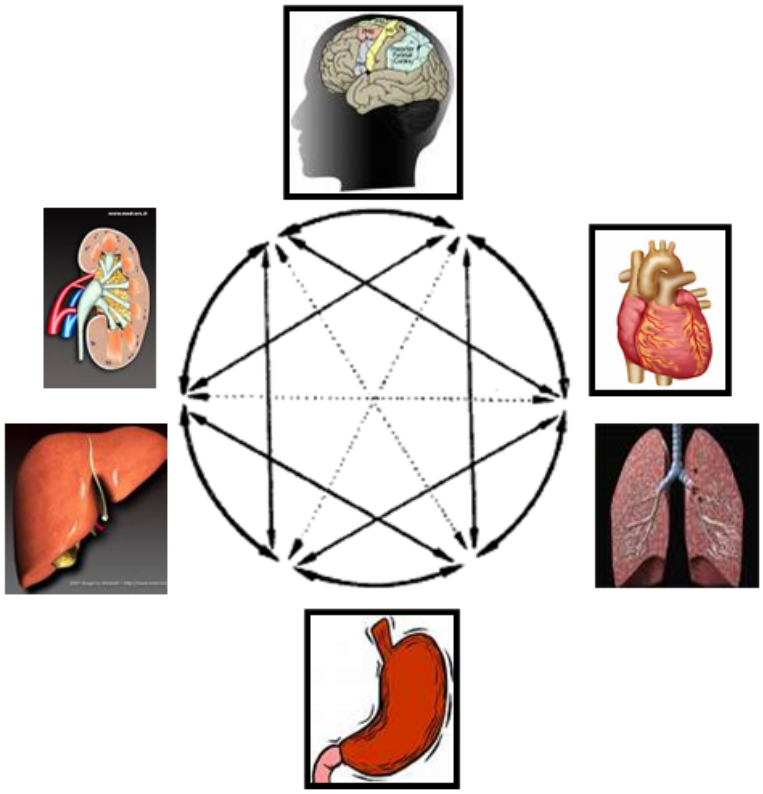


Figure 5 Neurohormonal reactions and PSD (psycho-somatic disorders) produced by SF/SA
Surce adapted after: I.B. Iamandescu (1999): Elemente de psihosomatică, Ed. INFOmedica, Bucureşti, p.4

Mac Lean and V. Reichlin, classify neurovegetative fibers into three large categories: *sympathetic* (adrenergic), *parasympathetic* and *non-adrenergic, non – cholinergic*. The latter, even though vehiculated by sympathetic or parasympathetic nerves, have different neurotransmitters. The stimulation of sympathetic and parasympathetic nerves is not entirely blocked by antiadrenergic and anticholinergic drugs, suggesting the existance of certain nervous fibers with other neurotransmitters (6).

Accoding to Şt.Odobleja (9), the vegetative nervous system (VNS) is the coordinating, normalising, compensatory organ reacting against disbalances. When discussing the criticism of the vago-sympathetic theory, he shows that it evolved from the dogmatic systematisation of Eppinger and Guillaume and the amphotropism of Danielopolu and explains that the theory „...neglects the existance of peripheral organs, their individuality, their direct and non-mediated reciprocal actions, direct (periphero-peripheral) nervous correlations between various organs are neglected: nothing is mentioned on direct relations and interactions from one organ to another. Only top to bottom actions are admitted as well as those exerted by means of the vago-sympathetic nervous system."(cit. 9 p.427); „in reality, there is no inhibitory system opposing an excitant system: each nervous fillet is successively inhibitor and exciter. From this stand point, each nervous fillet is an indifferent conductor, also each nervous cell (or ganglion) react either by excitation or by depression – case by case, depending on the excitant, on its dose, on the physiological state, etc."(cit.9 p.431).



Psychosomatic interactions. Source: adapted after Şt.Odobleja(1982): Psihologia Consonantistă, Ed. Ştiinţifică şi Enciclopedică, Bucureşti, p 425.

CONCLUSIONS

Of those above presented, the idea that Şt. Odobleja had an integrative vision on the activity of the two vegetative systems, the sympathetic and parasympathetic, emerges.

In his conception, the brain is an energy resonator, and sensorial organs are collectors, selectors, transformers, amplifiers and reductors, resonators-receptors, resonators-amplifiers, captating excitations (SF/SA) and transforming them into psychic energy which would be of unknown origin, probably transmitted by some endocrine secretions (neurotransmitters, neuromodulators) producing the condensation of peripheral excitations with central decondensation or detension or vice-versa (9), process which according to the consonance/disonance theory would lead to disbalances which endanger the psychic, endocrine and, finally, the general homeostasis.

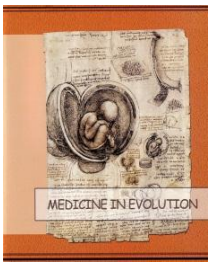
Regardless of the number and variety of stressors, the human organism only has one type of physiological defense mechanism and this mainly depends on the integrity of the corticosuprarenal gland whose hyperactivity is responsible of adaptation disturbances, the human organism being the victim of its own biological defense mechanisms.

REFERENCES

1. ARNOLOD B.MAGDA (1970): *Feeling and emotions*, Academic Press, New-York.
2. ARNOLD B.MAGDA (1960): *Emotion and personality*, University Press, New-York, Chicago.

3. BECK A.T. (1976): *cognitive Therapy and the Emotional Disordes*, International University Press, New-York.
4. ELLIS A.,GRIEGER R. (1977): *Handbook of Rationale therapy*, Springer Corp, New-York.
5. HOLDEVICI I. (2002): *Psihoterapia anxietătii-Abordări cognitiv comportamentale*, Ed.Dual Tech., Bucureşti, p.p.16-27.
6. IAMNADESCU I.B. (1993): *Stresul psihic şi bolile interne*, Ed.All, Bucureşti.
7. LAZARUS R.S. (1969*): Psychological stress and coping process*, New-York, McGroww-Hill.
8. ODOBLEJA ŞT.(1938): *Psychologie Consonantiste*, premiere volume, Librairie Maloine, 27, rue de L'ecole de medecine, Paris, p.48.
9. ODOBLEJA ŞT. (1982): *Psihologia Consonantistă*, Ed.Ştiinţifică şi Pedagogică, Bucureşti, p.p.32-34,110,407-439.
10. POPESCU N.(2001): *Doctor Şt.Odobleja*, Medicina in Evoluţie, Nr.1, Ed.Sigma Plus, Deva,p.p.7-11.
11. WELLS A.(1999): *Cognitive Therapy of Anxiety Disorders*, John and Sones Chichester, New-York, Weinheim, Brisbane, Singapore, Toronto, The 3 th Edition.

A MULTI-APROACH PULMONARY REHABILITATION PROGRAM IN RESTRICTIVE LUNG DISEASES



ALINA CROITORU[1], DIANA IONITA[4], IRINA PELE[2], CARMEN STROESCU[2], DANIELA GOLOGANU[5], ANDREEA DUMITRESCU[1], LUCIA MARINESCU[1], MIRON BOGDAN[1,3]

[1]Pulmonary Rehabilitation Center,"Marius Nasta"National Institute of Pneumology, Bucharest
[2]Respiratory Function Testing Department, Marius Nasta"National Institute of Pneumology, Bucharest
[3]University of Medicine and Pharmacy "Carol Davila"Bucharest, Faculty of Medicine, Department of Pneumology
[4]Department of Pneumology, Elias Emergency University Hospital, Bucharest
[5] Department of Internal Medicine, Clinical Hospital Colentina, Bucharest

ABSTRACT

Background: *Although pulmonary rehabilitation (PR) has proven effective in COPD, in restrictive lung diseases (RLD) the indication is not well established.*

Aim: *To evaluate the results of a rehabilitation program on RLD patients.*

Method: *Moderate-severe RLD patients were included. The parameters evaluated were: dyspnea (mMRC and BORG), pulmonary function (TLC, DLCO), exercise tolerance (6MWT, CPET), quality of life (SGRQ), anxiety and depression (HADS). PR program: outpatient, 7 weeks, 3 sessions/week, including: exercise training, physiotherapy, therapeutic education, psychological support.*

Results: *10 patients; mean age 42.5±9 years, 4 females, mean TLC 55.9□8% predicted. Etiology: idiopathic pulmonary fibrosis (4), sarcoidosis (2), radiation induced fibrosis (2), alveolar proteinosis (1), histiocytosis X (1). After PR we found significant improvement ($p<0.05$) in: dyspnea (mMRC 3.2±0.7 to 2.6±0.5, BORG 3.4±0.8 to 2±0.8), exercice tolerance (6MWT distance 416.3±92 to 460.4±93 m, VO2 max 12.59±3 to 14.27±3 ml/kg/min), anxiety and depression (HADS 15.2±5 to 11.5±4.8). The improvement in quality of life did not reach statistical significance (SGRQ 54.43±17 to 51.31±15).*

Conclusion: *In our RLD patients, a complex 7 weeks outpatient rehabilitation program resulted in benefits in terms of symptoms, exercise tolerance, anxiety and depression.*

Key words: *restrictive lung diseases, pulmonary rehabilitation, exercise training*

Correspondence to:

Alina Croitoru
MD, PhD student
Address: Marius Nasta National Institute of Pneumology, Viilor 90, Bucharest, Romania
Phone: +4 021 3356910
E-mail address: haulicaalina@yahoo.com

INTRODUCTION

Although the literature and studies in pulmonary rehabilitation area are focused mostly on COPD patients, it is very likely that the same benefits can be obtained in other chronic lung diseases.

The restrictive lung diseases (RLD) are a group characterized by specific radiological changes and functional pattern of restriction. Representative for this group is idiopathic pulmonary fibrosis (IPF).

In these patients, the main symptom is exertional dyspnea that leads to a decreased physical activity. The mechanism of the diminished exercise tolerance is complex, involving also impaired gas exchange, ventilatory limitation and peripheral muscle dysfunction (related to long term corticotherapy, deconditioning or systemic manifestations). Quadriceps weakness present in these patients leads to diminished exercise capacity, as evidenced in the study conducted by Nishiyama. In addition, patients with RLD develop hypoxemia and pulmonary hypertension, contributing to breathless and inactivity.

The IPF patients have a reduced level of physical activity, as shown in a study on lung transplant candidates. This patient's prognostic is related to impaired exercise capacity, as maximal oxygen uptake < 8.3 ml/min/kg or desaturation during 6MWT less than 88%. Therefore seems logical to presume that that they can obtain a benefit from exercise training.

Pulmonary rehabilitation (PR) aims to interrupt the vicious circle of inactivity through a series of specific measures (exercise training, physical therapy, therapeutically education) that give the patient a chance for social reintegration. Exercise training is the key point and the tools used are cycling, treadmill, stepping and walking. Training should cover all muscle and not neglect the upper limbs and, in selected cases, the respiratory muscle.

Pulmonary rehabilitation programs can be in patient, out patient, home based or community rehabilitation.

Although a series of studies revealed the benefits of pulmonary rehabilitation in RLD, currently there is not a full recommendation for this therapy.

MATERIAL AND METHOD

Subjects: The study was conducted in the Pulmonary Rehabilitation Center at "Marius Nasta"National Institute of Pulmonology, Bucharest, Romania. Patients with restrictive lung diseases that experienced dyspnea and decreased daily life activity were referred to the center by their pulmonologist. All had moderate-severe disease but were in stable clinical condition. Five of them have chronic respiratory failure and were on long-term oxygenotherapy (LTOT). Before the rehabilitation program started, all patients signed an informed consent.

The contraindications were: instable heart disease, poor compliance, impossibility to understand the procedures, the difficult accessibility to the center.

Parameters evaluated:

a) ***Pulmonary Function Tests*****:** Total lung capacity **(TLC)** was measured by using a bodypletismograph Jaeger. There were 3 repeatable and acceptable measures performed and the mean value was chosen. For Carbon Monoxide Diffusing Capacity (**DLCO)**

determination we used single breath maneuver. Two maneuvers were performed, the mean value being chosen.

b) ***Exercise capacity*** was assessed by 6 minutes walking test (6MWT) and standardized cardiopulmonary exercise test (CPET). **6 Minutes walking test (6MWT)** is a constant load exercise test that measures the longest distance a patient can walk on a flat surface (50 m) in a period of 6 minutes (6MWD); two tests were performed, 30 minutes apart. **Cardiopulmonary exercise testing (CPET)** represents one of the most important tools used to accurately assess exercise tolerance. It can provide significant information, as the maximal aerobic power or VO2 max; maximal power, used to set training intensity; gas exchange in rest and at effort[23].

c) ***Dyspnea*** was assessed by using **BORG** dyspnea scale (evaluated at the beginning of 6MWT) and modified Medical Research Council **mMRC** dyspnea scale**.**

d) ***Quality of life*** was assessed using the Romanian version of St George Respiratory Questionaire (**SGRQ**). It has 50 items and 3 domains: symptoms, activity (the disturbances to patient's daily physical activity) and impact (social functioning, psychological disturbances resulting from airways disease). Scores range from 0 to 100, with highest values indicating more limitations.

e) Psychological status was assessed using Hospital Anxiety and Depression Scale **(HADS).** It is a 14-item questionnaire whose value range from 0 to 21.

Pulmonary rehabilitation program design: The pulmonary rehabilitation program conducted in our center it is an outpatient program consisting in 20 sessions (3 session / week), approximately 7 weeks. The components are: peripheral muscle training (legs and arms muscle), physical therapy, education and psychological support.

Training protocol: for lower limbs aerobic endurance training was performed with a cycloergometer (fig.1). For establishing the workload we used the maximal power obtained during the CPET. We start with a minimal power (20 watts) and increased with 5-10 wats per week, in order to reach 60-80% of maximal power obtained at CPET.

Every session of rehabilitation includes 20-30 minutes cycling, 15 minutes of exercise for arm muscle and 10 minutes of physiotherapy. The vital signs (SaO2), blood pressure, heart rate were followed up for safety. For the patients that were on long-term oxygenotherapy, the training was also performed with it.

Upper limb training was not standardized. The patients performed series of 10 exercises with free weights or at multifunctional device that contains elastic bands (fig. 2).

Figure 1. Lower limb training on the cycloergometer

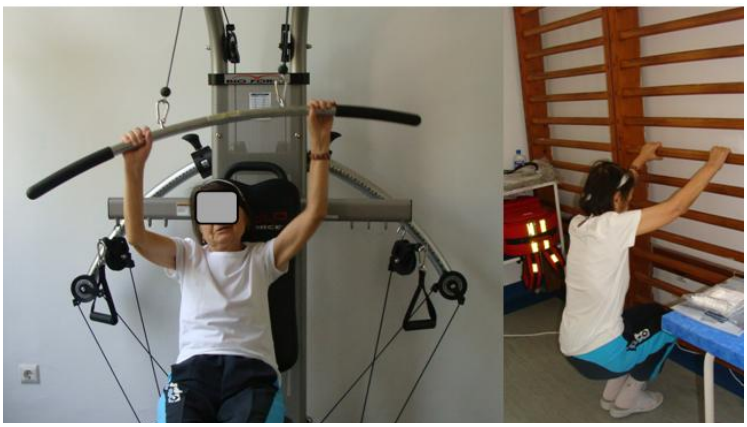


Figure 2. Example of exercise for upper limbs

Physical therapy consisted in learning breathing and relaxation techniques, airway clearance. There were made under the supervision of a physiotherapist.

Therapeutically education: The patients received explanations about the nature of the disease, symptoms and management and the impact on their daily activities. They learned on how to modulate their lifestyle to their illness, and how to use energy conservation techniques.

Psychological support: one psychologist organized meeting groups (usually 3-4 patients) once per week. He discussed with them about the acceptance of their illness and modalities on how to deal with the stress, anxiety and depression. A special concern was given for the patients waiting lung transplantation.

STATISTICAL ANALYSIS

The parameters values were compared before and after 7 weeks on the rehabilitation program. Statistical analysis was performed using SPSS var 18.0. A p value < 0.05 was considered significant.

RESULTS

13 patients with restrictive lung disease were referred to our rehabilitation center. During the pre-screening period, one patient suffered an episode of severe respiratory infection. Two non compliant patients left the program after few sessions. The present report includes the results for 10 patients who finished the 7 weeks rehabilitation program. The etiology was: idiopathic pulmonary fibrosis (4), sarcoidosis (2 patients), radiation induced fibrosis (2), alveolar proteinosis (1), histiocytosis X (1). Two patients were enrolled on a lung transplantation list.

The patient's baseline characteristics are summarized in table I.

Table I. Baseline characteristics of RLD patients

Patients characteristics	
Age (years)	42.5 ± 9
Sex	4 females/ 6 males
BMI (kg/m²)	24.56 ± 4
TLC (l)	3.24 ± 0.7
TLC (% predicted)	55.9 ± 8
DLCO (% predicted)	42.64 ± 11
SaO2 (%)	94.6 ± 2.8
6MWD (m)	416.3 ± 92
VO2 max (ml/min/kg)	12.59 ± 3

Lung function tests: The functional pattern was restrictive in all cases, with mean TLC value 3.24 ± 0.7 l (55.9 ± 8% predicted). The DLCO was severely decreased, with a mean value of 42.64 ± 11% predicted. At baseline, DLCO impairment was significantly correlated with HADS score (p=0.003) and SGRQ (p=0.04). As expected, no significant changes were seen in lung function tests after rehabilitation (table II).

Exercise tolerance: Following the training period there was a significant increase in 6MWT distance, with 44.1 m, from 416.3 to 460.4 m (p=005). Maximal power obtained during CPET increased with 3 watts, without reaching statistical signification. More important was the finding that maximum oxygen uptake increased significantly (p=0.04), with 1.68 ml/kg/min.

Dyspnea: We noticed a statistically significant improvement in

shortness of breath, regarding three parameters evaluated. First, mMRC dyspnea score significantly decreased with 0.6 points; second, there was amelioration in BORG score with 1.4 points, and, third, symptoms domain from SGRQ score improved with 9.67 points. We can therefore appreciate that in terms of breathlessness, rehabilitation led to a major improvement.

Table II. Parameters values at baseline and after completion of rehabilitation program

Parameters	**Before rehabilitation**	**After rehabilitation**	
n	**10**	**10**	
TLC %	55.9±8	56.4±8	p=0.2
DLCO %	42.6±11	45.76±13	p=0.2
6 MWD (m)	416.3±92	460.4±93	p=0.005
P max (Watts)	68±25	71±28	p=0.2
VO2 (ml/min/kg)	12.59±3	14.27±3	p=0.04
Dyspnea mMRC	3.2±0.7	2.6±0.5	p=0.03
Dyspnea BORG	3.4±0.8	2±0.8	p=0.004
HADS	15.2±5	11.5±4.8	p=0.01
SGRQ	54.43±17	51.31±15	p=0.5

Quality of life: Although we found an improvement in total SGRQ score with 3.12 points, it did not reach statistically significance (table III). Looking to the three domains of SGRQ (table 3), we noticed that the highest and significant improvement was in the symptoms domain (p=0.03).

Table III. SGRQ score before and after pulmonary rehabilitation

SGRQ	Before rehabilitation	After rehabilitation	
n	10	10	
SGRQ- symptoms	53.9±14	44.23±20	p=0.03
SGRQ - activity	71.3±22	75.26±15	p=0.7
SGRQ - impact	44.82±19	39.88±27	p=0.3
SGRQ - total	54.43±17	51.31±15	p=0.5

Anxiety and depression: At the beginning of the rehabilitation program, all patients had a significant degree of anxiety and depression. The measures taken: exercise re-adaptation, psychological counseling, lead to a clearly improved mood. After rehabilitation program, HADS score decreased with 3.7 points.

DISCUSSIONS AND CONCLUSIONS

The research in the pulmonary rehabilitation field is focused mostly on COPD patients. But, since the predominant symptom in restrictive lung diseases is exertional dyspnea, it seems logical that a physical training would improve this patient's status.

However, there is no sufficient evidence for pulmonary rehabilitation recommendations in restrictive lung diseases. In the last ATS/ERS statement of IPF for is stipulated that "the majority of patients with IPF should be treated with pulmonary rehabilitation, but pulmonary rehabilitation may not be reasonable in a minority"[21]. And yet, for restrictive lung diseases there are not very many therapeutically options. In IPF (idiopathic pulmonary fibrosis) the median survival is 3-5 years and not all patients have a chance to riches lung transplantation.

A recent meta-analysis which analyzed 34 papers about 19 interventions in 3635 patients find that

pulmonary rehabilitation in restrictive lung diseases have a positive effect on 6MWD, quality of life and a mixed effect on dyspnoea.

As in COPD, the rehabilitation programs can be in-patient (in hospital or dedicated centers), out-patient (ambulatory) or home-based. In a large serie of RLD patients (402), an inpatient rehabilitation program with a mean period of 30 days lead to an improvement on 6MWT distance with 46 m.

Another program, this time home-based, 6 months, improved respiratory muscle forces, exercise tolerance, health-related quality of life, and the perception of dyspnea in patients with restrictive lung disease to the same extent as in COPD patients.

There are some controversial data regarding which RLD patient benefits more from pulmonary rehabilitation: those with very severe disease or those with moderate/mild disease. The beneficial effects of pulmonary rehabilitation may be more pronounced in patients with worse baseline functional status. On the other hand, Holland group observed a tendency to respond less to PR as the disease progress.

A significant proportion of RLD patients are referred to rehabilitation programs when the disease is advanced and they are already with respiratory failure and need for oxygen. A recent observational study on an outpatient, 7 weeks, rehabilitation program, in 115 RLD patients found that patients on oxygenotherapy gain less from PR and have a higher mortality rate. On the other hand, Naji find a better improvement of exercise endurance (treadmill test) after 8 weeks of rehabilitation for patients with LTOT compared with those not using LTOT.

Duration of rehabilitation programs in RLD varied, from few weeks to 6 months, mostly being performed on short periods of time. Although pulmonary rehabilitation can have immediate positive results, their long-term maintenance has not been well evidenced. Holland group find that, unfortunately, the benefits were not sustained 6 months following rehabilitation program.

It seems logical to asume that longer rehabilitation program can achieved higher physiological training effects. Altough RLD patients responded well after 12 weeks of pulmonary rehabilitation, the results were even better after 24 weeks, in terms of exercice tolerance and quality of life.

Naji find in a group of 26 patients with interstitial lung diseases that underwent an 8 week rehabilitation significant improvement in dyspnea, quality of life, anxiety and depression, exercice endurance, but also a reduction on hospital admission days.

One of the advantages of the pulmonary rehabilitation is the absence of side-effects, present in some pharmacological therapy.

Our rehabilitation program was conducted outpatient, within a period of 7 weeks, in order to reach a total of 20 sessions. We choose this length of program because of the following reasons: although a short program, it seems to be enough time to assure beneficial effects, the patients must provide their own transportation to the center and a program too long can result in a large number of withdrawals.

This program was not specific for patients with restrictive lung diseases, it was a general multi-approach program including, besides training, therapeutic education. A psychologist organized weekly group meeting; a special approach was used in patients candidates to lung transplantation.

We obtained significant benefits in term of symptoms, expressed by improvements in tools used to quantified dyspnea: mMRC score (-0.6 points) and BORG score (-1.4 points).

For the exercise tolerance, there was a significant increase in distance

obtained at 6MWT (with 44 m) and less important in maximal power obtained at CPET (3 watts). The most important was, however, the significant improvement in maximum oxygen uptake (VO2, from 12.59 to 14.27, p=0.04) that reflects the physiologic and metabolic changes occurred after exercise training.

An increase of SGRQ score was seen, even it did not reached statistical significance. The benefits on psychological status (HADS score improved with 3.7 points, p=0.01) it may be the combined result of improved symptoms and exercise tolerance that leads to increased self-confidence, but also the support provided by a psychologist.

One if the major lack of our study was the small number of patients. One of the reasons was the difficult access (the patient transport to the rehabilitation center must be assured by the patient himself or by the family). In some cases, the severity of the disease not allowed the patients to reach the center. For these patients, a home based rehabilitation program is more reliable. These are the first results of a study we plan to continue on a larger number of patients and a control group.

It is also very important to increase the knowledge of pulmonary rehabilitation on Romanian medical stuff and general population. Given the limited treatment options in this patients, pulmonary rehabilitation is a significant therapy to consider.

We also need to follow these patients after the training was over, in order to see if the benefits are maintained on long term, knowing that usually stop training leads to physical deconditioning. Therefore, it will be important to maintain daily physical activity to maintain the beneficial effects of the respiratory rehabilitation.

In conclusion, this study showed that a multi approach pulmonary rehabilitation program can bring benefits in patients with restrictive lung diseases.

Acknowledgment

The material for this study was obtained with the research grant REABILUM (contract ANCS nr. 24/14.09.2007).

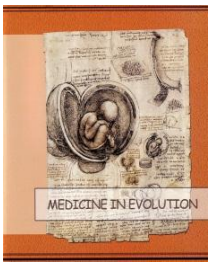
The authors wish to thanks the patients for permission to use their images in this article.

REFERENCES

1. Tudorache V, Lovin S, Friesen M. Tratat de reabilitare pulmonara. Ed. Mirton Timisoara 2009
2. Surpase P. et Groupe Alveole: Rehabilitation respiratoire: Guide pratique, Ed. Imothep, 2008
3. Andrew L. Ries and collegues: Pulmonary Rehabilitation: Joint ACCP/AAVPR Evidence Based Clinical Practice Guidelines, CHEST 2007;131;4-42
4. ATS/ERS Statement on Pulmonary Rehabilitation, Am J Respir Crit Care Med, vol 173, pp 1390–1413, 2006
5. Donner CF, Decramer M. Pulmonary rehabilitation. Eur Respir Monogr 2000;13:1–200.
6. Laveneziana P. Qualitative aspects of exertional dyspnea in patients with restrictive lung disease. Multidiscip Respir Med. 2010 Jun 30;5(3):211-5.
7. Lama VN, Flaherty KR, Toews GB, Colby TV, Travis WD, Long Q, Murray S, Kazerooni EA, Gross BH, Lynch JP 3rd, Martinez FJ. Prognostic value of desaturation during a 6-minute walk test in idiopathic interstitial pneumonia. Am J Respir Crit Care Med. 2003 Nov 1;168(9):1084-90.
8. Nishiyama O, Taniguchi H, Kondoh Y, Kimura T, Ogawa T, Watanabe F, Arizono S. Quadriceps weakness is related to exercise capacity in idiopathic pulmonary fibrosis. Chest. 2005 Jun;127(6):2028-33.
9. Kenn K, Gloeckl R, Behr J. Pulmonary Rehabilitation in Patients with Idiopathic Pulmonary Fibrosis - A Review. Respiration. 2013 Aug 6:89-99.
10. Wickerson L, Mathur S, Helm D, Singer L, Brooks D. Physical activity profile of lung transplant candidates

with interstitial lung disease. J Cardiopulm Rehabil Prev. 2013 Mar-Apr;33(2):106-12
11. Bajwah S, Ross JR, Peacock JL, Higginson IJ, Wells AU, Patel AS, Koffman J, Riley J. Interventions to improve symptoms and quality of life of patients with fibrotic interstitial lung disease: a systematic review of the literature. Thorax. 2013 Sep;68(9):867-79
12. Huppmann P, Sczepanski B, Boensch M, Winterkamp S, Schönheit-Kenn U, Neurohr C, Behr J, Kenn K. Effects of inpatient pulmonary rehabilitation in patients with interstitial lung disease. Eur Respir J. 2013 Aug;42(2):444-53
13. Johnson-Warrington V, Williams J, Bankart J, Steiner M, Morgan M, Singh S. Pulmonary rehabilitation and interstitial lung disease: aiding the referral decision.J Cardiopulm Rehabil Prev. 2013 May-Jun;33(3):189-9
14. Holland AE, Hill CJ, Glaspole I, Goh N, McDonald CF. Predictors of benefit following pulmonary rehabilitation for interstitial lung disease. Respir Med. 2012 Mar;106(3):429-35.
15. Holland AE. Exercise limitation in interstitial lung disease - mechanisms, significance and therapeutic options.Chron Respir Dis. 2010;7(2):101-11.
16. Holland A, Hill C. Physical training for interstitial lung disease.Cochrane Database Syst Rev. 2008 Oct 8;(4):CD006322.
17. Holland AE, Hill CJ, Conron M, Munro P, McDonald CF. Short term improvement in exercise capacity and symptoms following exercise training in interstitial lung disease. Thorax. 2008 Jun;63(6):549-54.
18. Naji NA, Connor MC, Donnelly SC, McDonnell TJ. Effectiveness of pulmonary rehabilitation in restrictive lung disease. J Cardiopulm Rehabil. 2006 Jul-Aug;26(4):237-43.
19. Salhi B, Troosters T, Behaegel M, Joos G, Derom E. Effects of pulmonary rehabilitation in patients with restrictive lung diseases. Chest. 2010 Feb;137(2):273-9.
20. Kagaya H, Takahashi H, Sugawara K, Kasai C, Kiyokawa N, Shioya T. Effective home-based pulmonary rehabilitation in patients with restrictive lung diseases. Tohoku J Exp Med. 2009 Jul;218(3):215-9.
21. 21. An Official ATS/ERS/JRS/ALAT Statement: Idiopathic Pulmonary Fibrosis: Evidence-based Guidelines for Diagnosis and Management. Am J Respir Crit Care Med Vol 183. pp 788–824, 2011
22. Ferreira A, Garvey C, Connors GL, Hilling L, Rigler J, Farrell S, Cayou C, Shariat C, Collard HR. Pulmonary rehabilitation in interstitial lung disease: benefits and predictors of response. Chest 2009;135: 442–447.
23. Stroescu C, Ionita D, Croitoru A, Toma C, Paraschiv B. The contribution of exercise testing in the prescription and outcome evaluation of exercise training in pulmonary rehabilitation. Maedica. 2012;7(1):80-6.
24. Fell CD, Liu LX, Motika C, Kazerooni EA, Gross BH, Travis WD, Colby TV, Murray S, Toews GB, Martinez FJ, Flaherty KR. The prognostic value of cardiopulmonary exercise testing in idiopathic pulmonary fibrosis. Am J Respir Crit Care Med. 2009 Mar 1;179(5):402-7.

MANAGEMENT OF MDR-TB IN THE WEST OF THE COUNTRY AND POSSIBILITIES OF IMPROVEMENT



ADRIANA SOCACI[1], GHEORGHE NINI[2]

[1] Clinical Hospital"Dr. V.Babeş", Pneumophthisiology Ambulatory Center, Timişoara
[2]Department of Pneumology, "Vasile Goldis"Western University, Arad

ABSTRACT

The spreading of multiple-drug resistant tuberculosis (MDR TB) is a public health problem, its prevalence indicating the effectiveness of TB control programmes. MDR TB indicates resistance to the most effective treatment, isoanizide and rifampicin. Extensive tuberculosis (XDR TB) is actually MDR TB with an extra resistance of the bacilli to any fluoroquinolone and to at least one second-line injectable drug. Multi-drug resistance originates in an inadequate treatment and is aggravated by a late diagnosis, consequently MDR-TB/XDR-TB has become a worldwide epidemic constantly enhanced by poverty, HIV infection, and inadequate control over the transmission of the disease. In the last few years, the WHO has paid a special attention to multiple-drug resistance and has set a series of recommendations meant to control the spreading of germ-resistant TB infection. The current study aims at assessing the management of MDR TB cases in the western part of Romania (Timis and Arad counties) in order to identify new solutions for a better management.

Key words: *tuberculosis, multiple-drug resistant, public health problem*

Correspondence to:

Dr. Adriana Socaci
Address: Clinical Hospital"Dr. V.Babeş", Pneumophthisiology Ambulatory Center, Timişoara
Phone: +4 0723705832
E-mail address: adriana_socaci@yahoo.com

INTRODUCTION

MDR TB/XDR-TB has become a worldwide epidemic. In 2010, there were 650,000 cases of MDR TB (5.4% of the known TB cases) with 9% of these being XDR TB, and by the end of 2011, 77 countries have reported at least one case of XDR TB.

For a better estimation of the chemoresistant cases in Romania, two national chemoresistance studies were conducted, the first in 2003-2004, and the second in 2009-2010. The first study showed an incidence of multiple-drug resistance of 2.9% in the new cases, and 11.6% in re-treatment cases; the second study showed an incidence of XDR of 9.9% in the new cases, and 11.6% in re-treatment cases.

In our country, TB continues to have a high impact despite all measures taken in applying the National TB Control Programme. In 2011, the prevalence of MDR TB was 4.19% (1528 cases), 1.96% XDR (30 cases). The western part of Romania is the area where the incidence of TB still exceeds the national values, and this also includes MDR TB.

MATERIAL AND METHOD

We have conducted a retrospective– prospective study assessing the management of MDR TB cases recorded in the western part of Romania (Timis and Arad counties).

Pentru realizarea The information was gathered on a chart showing: general information about the participant (age, gender), the patient's history, clinical and para-clinical characteristics (type of the MDR TB case, radiological exam, KB bacteriological exam, KB anti-biogram), associated disorders, monitoring and evaluation.

The study group was selected according to the following criteria: patients with MDR TB recorded during 2008 - 2009, excluding the post-mortem patients recorded in this interval.

The clinical situation was analysed according to the type of TB, the category of MDR TB, the results of the antibiogram (validation and concordance of county labs vs national reference lab - NRL), the duration of anti-TB treatment, monitoring and final evaluation of the cases.

The type of TB may be: a new case (N), relapse (R), failure (F), abandon (A) or chronic (C). *A new case* is a patient who has never received anti-TB treatment or who has received anti-TB treatment for less than a month. *Relapse*: a patient who had previously been treated for TB, has been declared cured or fully treated, and has a positive TB diagnose following his bacteriological exam. *Failure:* a patient who started re-treatment after having „failed"to yield results for a previous treatment. *Abandon:* a patient who started re-treatment after having "abandoned"a previous treatment and is bacteriologically positive, or his/her physician decides that a new treatment has to be resumed after abandoning the previous one. *Chronic:* a patient who started re-treatment after having been assessed as a "failure"of a previous re-treatment.

The category of MDR-TB patients has been sub-divided, according to the patients' history, in: *new MDR-TB case* (the patient who has never been previously been treated for the associated disorder for more than one month), *MDR TB patient treated with first-line medication* (patient who had previously received treatment for more than one month, but only with first-line drugs), and *MDR TB case treated with second-line medication* (patient who had previously been treated for more than one month with second-line drugs,

regardless whether associated or not with first-line medication).

The category of *first-line (essential) anti-TB* medication includes: Isoniazide (I), Rifampicin (R), Pyrazinamide (P), Streptomycin (S) şi Etambutol (E). *Second-line (backup) anti-TB drugs* include: aminoglycosides (Kanamycin-K, Amikacina-AK, Capreomycin-CM), thiamides (Prothionamide-PTM, Ehtionamide-ETM), fluoroquinolone (Ciprofloxacin-CPX, Ofloxacin-OFX, Moxifloxacin-MFX), Cicloserin (CS), PAS and Claritromycin (CL).

Multiple-drug resistant TB denotes resistance to the most effective anti-TB treatment, isoniazide and rifampicin. Extensive TB (XDR MDR-TB) refers to MDR TB with an extra-resistance of bacilli to any fluoroquinolone, and to at least one second-line injectable medicine.

RESULTS AND DISCUSSIONS

The study group was formed taking into account the geographical area of the subjects (Arad or Timis counties) and the pre- or post-mortem diagnosis of MDR TB. According to the inclusion criteria, only 41 (95.3%) participants remained in the study group, subdivided in: 18 cases from Arad county and 23 cases from Timis county (Fig.1).

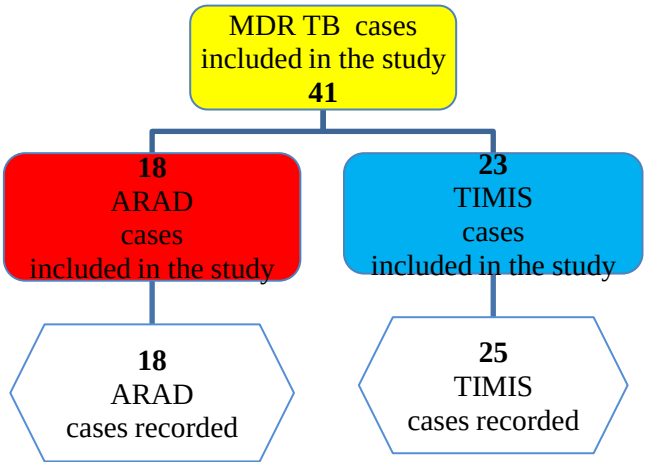


Figure 1. Participants in the study

Gender distribution showed the predominance of men 82.9% (n=34) vs women 17.1% (n=7) (Fig. 2).

Age distribution, predominance of the age group 44 - 45 years in men and 35 - 44 years in women (Fig. 3).

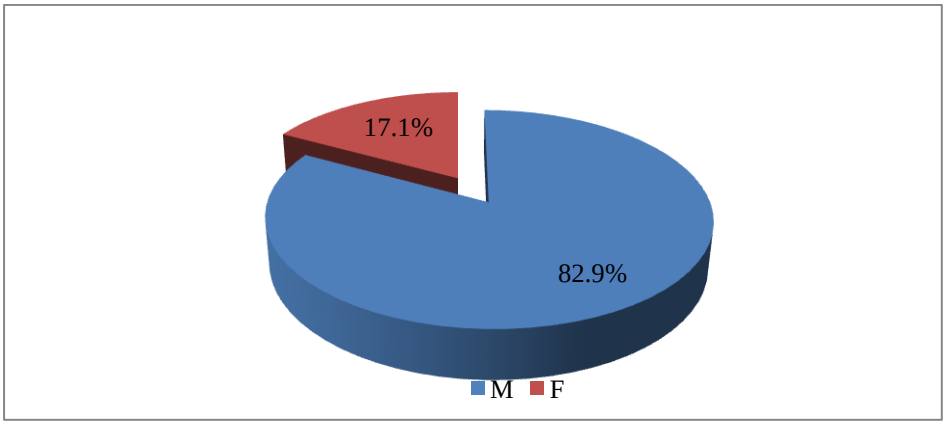


Figure 2. Gender distribution of the study group

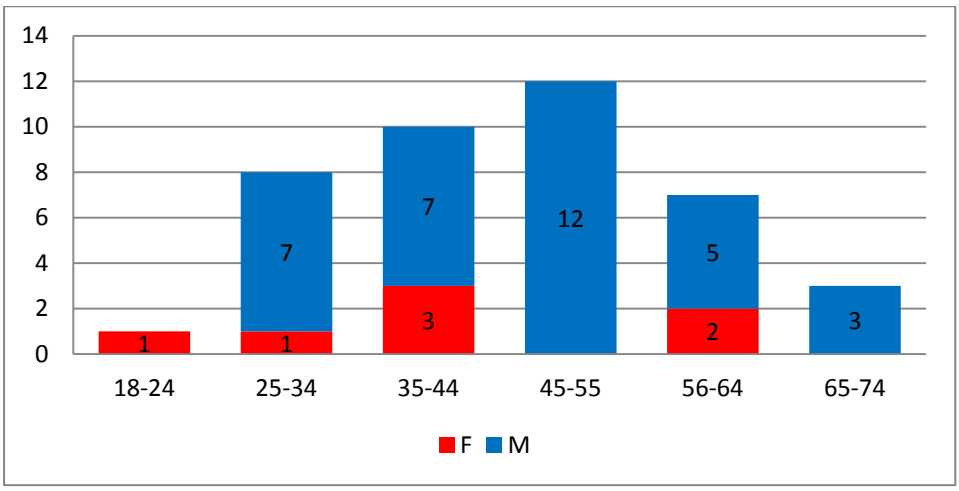


Figure 3. Age distribution of the study group

The distribution according to geographical background shows: 48.8% (n=20) rural, 51.2% (n=21) urban (Fig. 4).

According to the patients' profession, 39% (n=16) of the patients were retired due to illness, 29.33% (n=12) were unemployed, 12.2% (n=5) retired due to age limit, 17.1% (n=7) employed, 2.4% (n=1) pupils/students (Fig. 5).

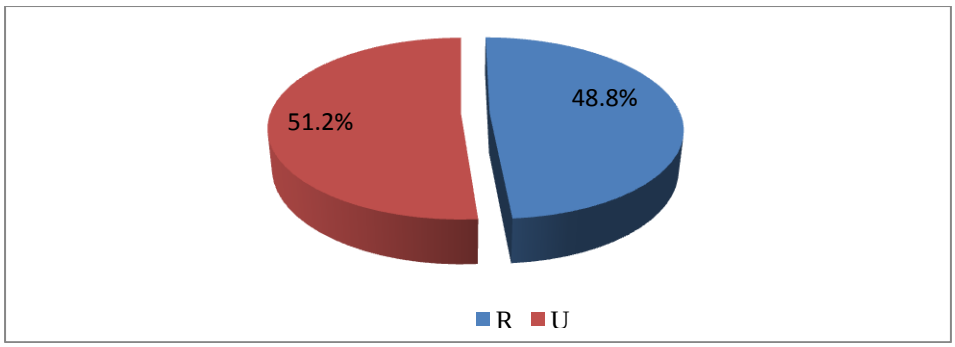


Figure 4. Distribution according to geographical background

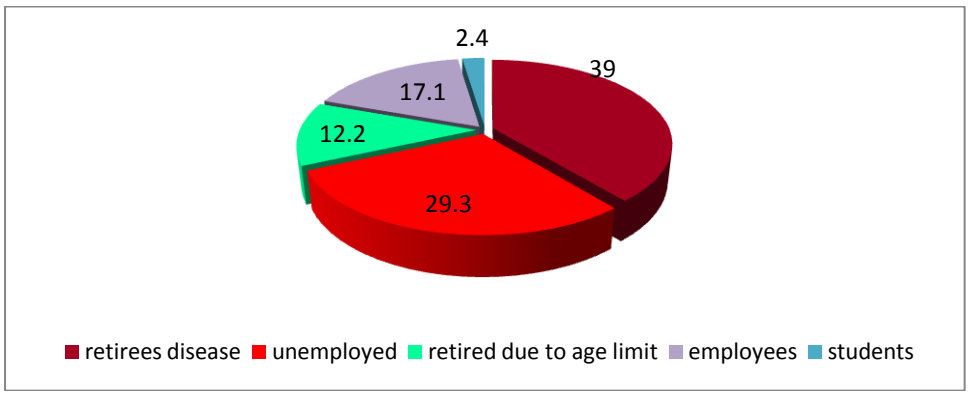


Figure 5. Distribution of the study group according to profession

An assessment of the study group according to the type of TB that can be considered as MDR showed that almost half of the patients were relapses (48.8%, n=20), 19.5% (n=8) chronic cases, 17.1% (n=7) failures, and 2.4% (n=1) defaulted. To be noted, that five of the MDR patients were new cases. (fig. 6).

According to the patients' history, the classification of MDR TB types, following the WHO regulations and the national guidelines, showed that there were no patients in the *category I* TB_{MDR} (new case of MDR TB),

more than half of the patients (65.9%, n=27) fell under *category III* TB_{MDR} (MDR TB treated with second-line medication) and only 34.1% (n=14) fell under *category II* TB_{MDR} (MDR TB treated with first-line medication). The distribution according to the category of MDR TB is shown in Fig. 7.

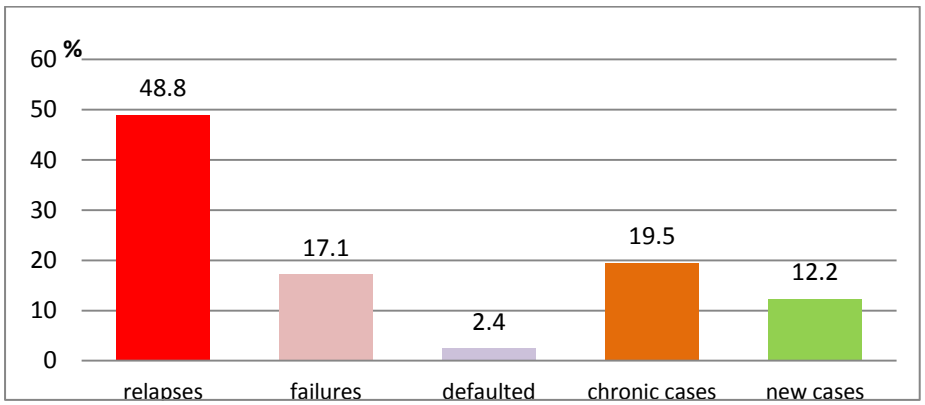


Figure 6. Distribution of the study group according to the type of TB in relation to MDR TB

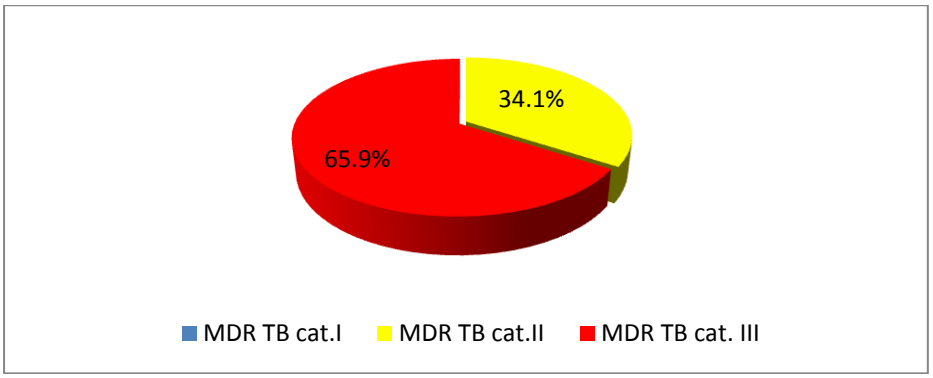


Figure 7. Distribution of the study group according to the MDR TB classification

ABG analysis performed in order to set MDR TB diagnosis revealed a 100% concordance between the results of the county labs and the NRL. However, it should be noted that not all ABGs with RH chemoresistance, coming from the county labs, were validated by the NRL, i.e., only 51.2% (n=21) out of 41 ABGs were validated (Fig. 8). According to each research centre, the validation of ABG by the NRL was 38.9% (7 out of 18) in Arad vs. 60.9% (14 out of 13) in Timis (Fig. 9).

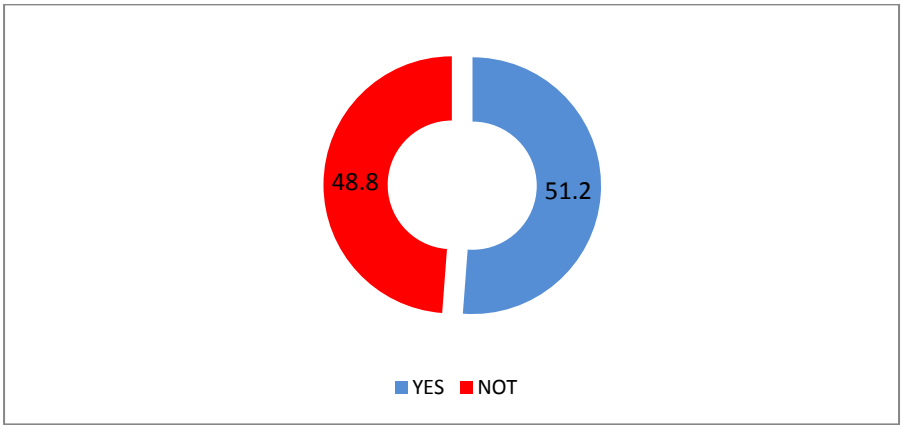


Figure 8. Distribution of the cases according to ABG validated by the NRL

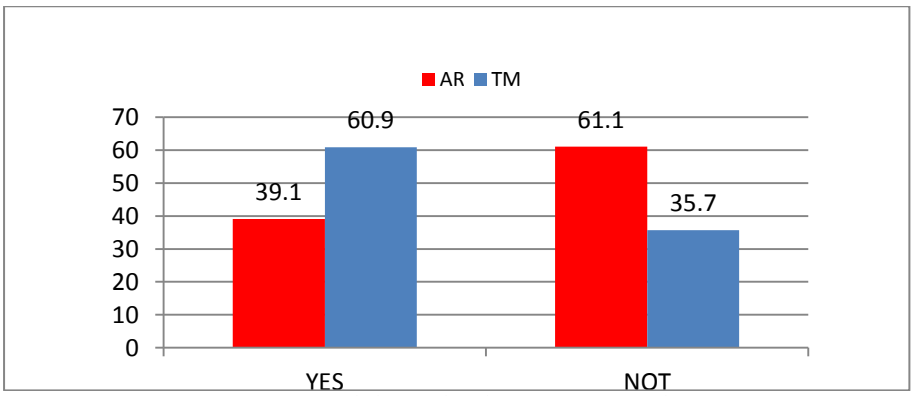


Figure 9. ABG validation by the NRL, per study centre

The assessment of existing data concerning the spectrum of chemoresistance for the NRL-validated ABGs (n=21) shows the following: 52.4% (n=11) HR, 19% (n=4) HRK, 9.5% (n=2) HRES, 9.5% (n=2) HREK, 4.8% (n=1) HRESK and 4.8% (n=1) HRESQ (Fig. 10). Figure 11 shows the spectrum of chemoresistance for the NRL-validated ABGs per study centre.

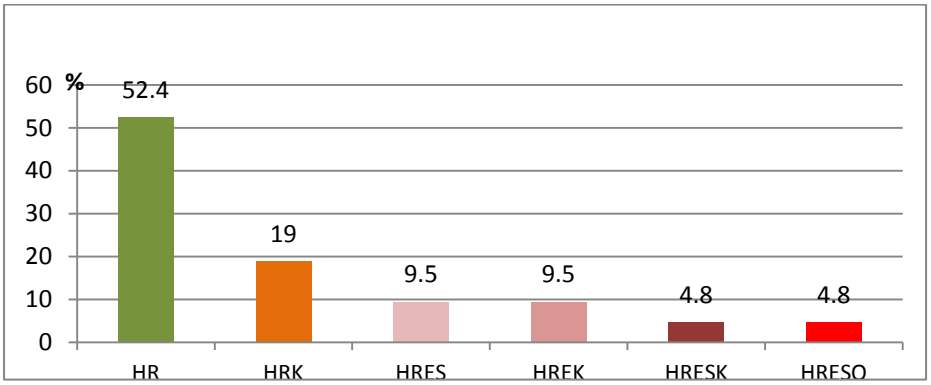


Figure 10. ABG chemoresistance spectrum validated by the RNL

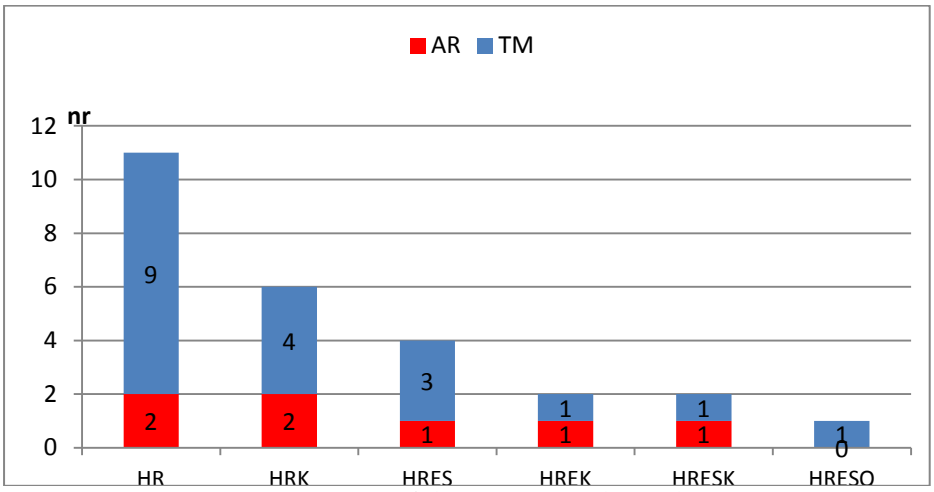


Figure 11. Spectrum of chemoresistance by study centre

The assessment of MDR TB cases according to the radiological aspect showed that more than half of the cases (51.2%, n=21) had multiple cavities, 12.2% (n=5) had a single cavity, 24.4% (n=10) ulceration extended to both lobes, 12.2% (n=5) ulceration extended to a single lobe (Fig.12).

From the point of view of an associated disorder (Fig.13) only 26.8% (n=11) of the cases had associated disorders, represented by chronic alcoholism (n=5), liver diseases (n=4), type 1 diabetes mellitus (n=1) and uterine cancer (n=1).

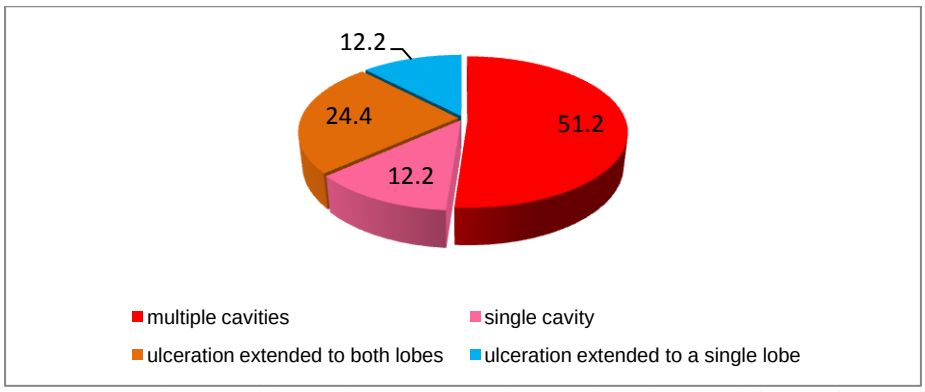


Figure 12. Distribution of the study group according to the radiological forms of MDR TB

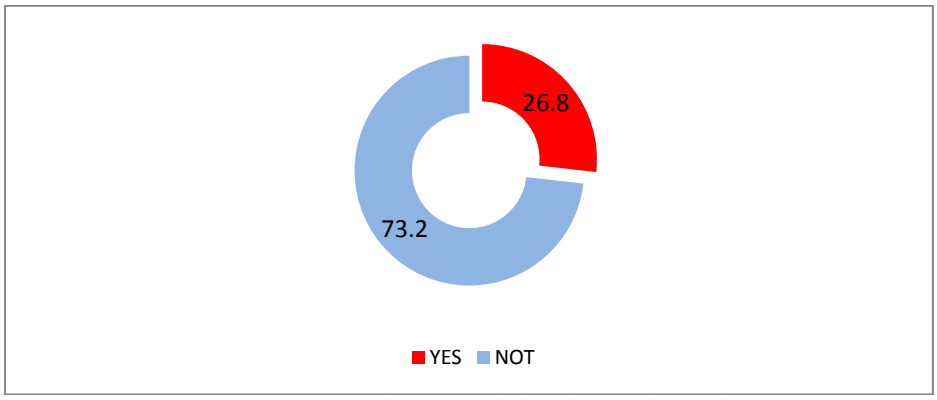


Figure 13. Percentage of associated disorders in the study group

All the MDR cases in both counties were hospitalized up to 78% (n=32) for periods varying between 3–12 months in pneumophthisiology sanatoriums (mainly Geoagiu and Brad) and 22% (n=9) of the cases were admitted (40 – 60 days) in the pneumophthisiology sections of the two county hospitals. Per study centre, admittance to specialised sanatoriums had a percentage of 83.33% (n=15) for Arad and 73.9% (n=17) for Timis county (Fig. 14).

The progress of MDR TB cases under treatment showed a success rate of only 41.5% (34.2%-cured, 7.3%-complete treatment) alongside a high rate of death and defaulted, 19.5% and 14.6% respectively. (Fig. 15). Fig. 16 shows the progress of MDR TB cases under treatment

The length of the treatment required for a patient to be declared cured or to receive full treatment varied widely, from 12 to 36 months. (Fig. 17).

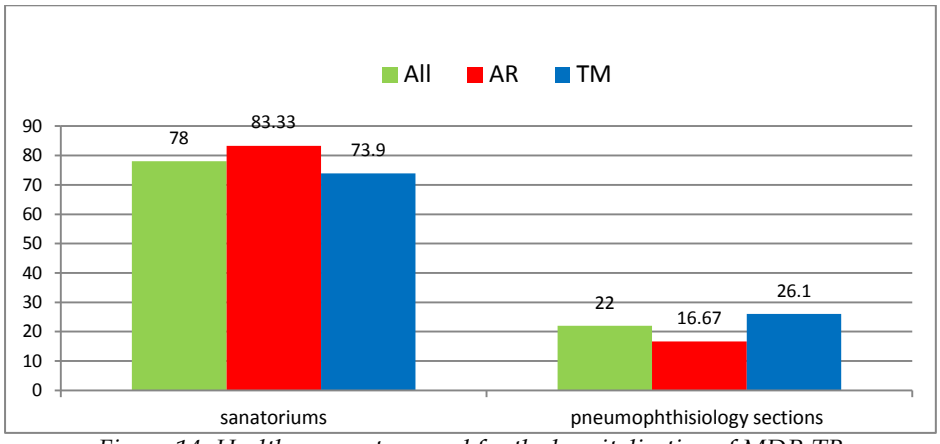


Figure 14. Healthcare centres used for the hospitalisation of MDR TB

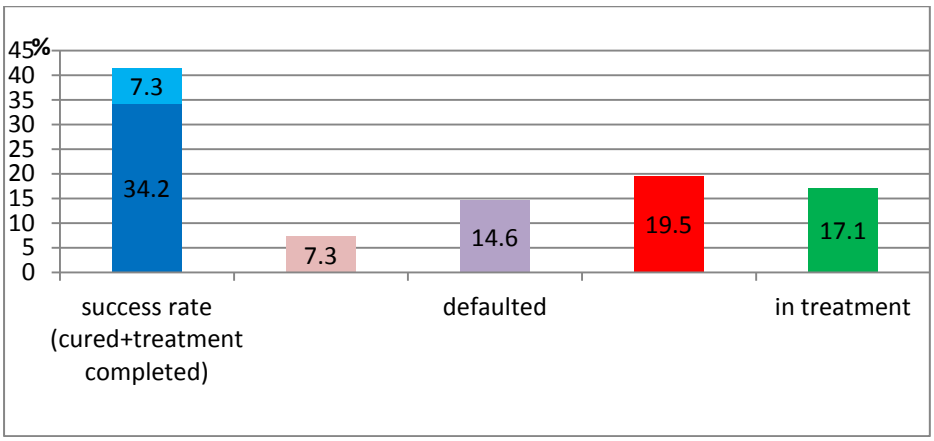


Figure 15. The progress of MDR TB cases under treatment

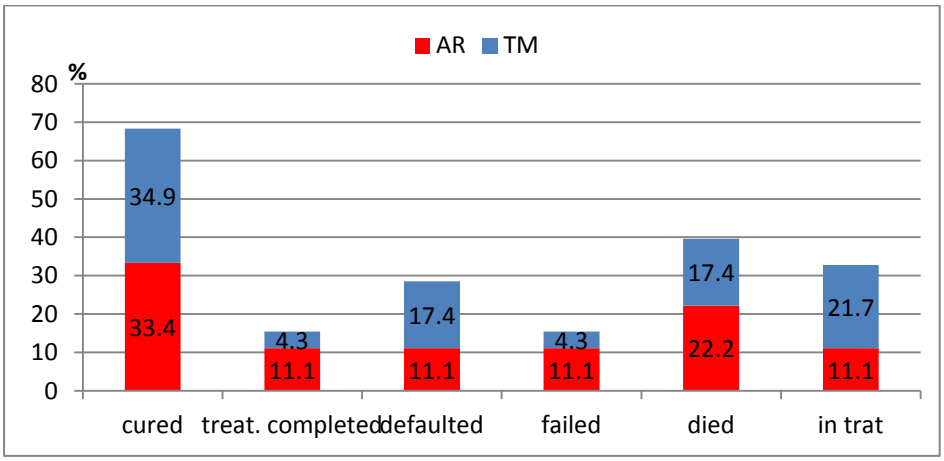


Figure 16. Therapeutic results for MDR TB per study centre

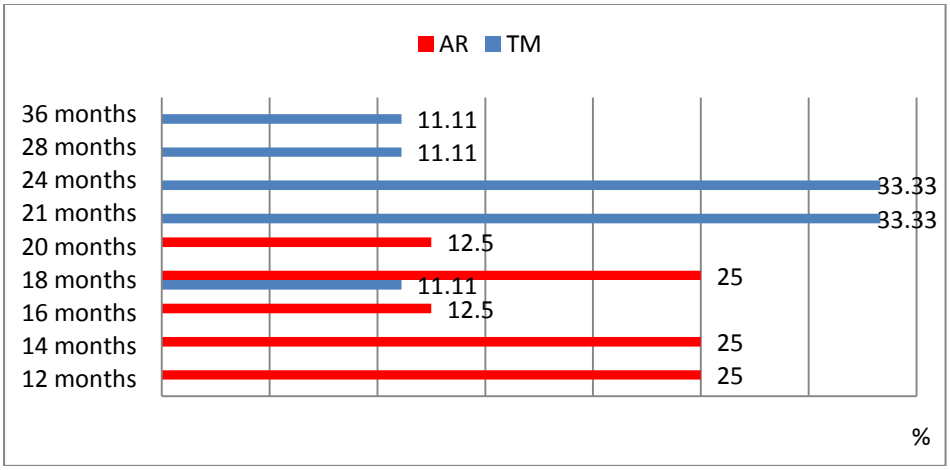


Figure 17. Length of MDR TB treatment in cured and fully treated cases

Bacteriological and radiological monitoring was also extremely varied for both counties, thus for cured or fully treated cases it varied between 1-2 months, in the case of bacteriological monitoring, without repeating ABG after 6 months, for all cases that required this investigation; the radiological exam was repeated at a 6-months interval for almost all cases (Fig. 18).

The assessment of the therapeutic success and death rate compared to the chemoresistance spectrum showed that in the MDR TB cases that were declared cured or fully treated the chemoresistance spectrum was HR 100% (n= 12); in the case of deaths, HR chemoresistance was only 12.5% (n=8), while 88.5% of the cases had an extended chemoresistance spectrum

(HRE-25%, HRES-37.5% and HRESK-25%) (Fig.19).

The analysis of the same parameters (therapeutic success and death rate) compared to hospitalisation in sanatoriums showed that only 70.6% of the cases with therapeutic success were hospitalised in sanatoriums for 3-6 months, while 100% of the deceased cases were hospitalised in sanatoriums for 6-8 months (Fig. 20).

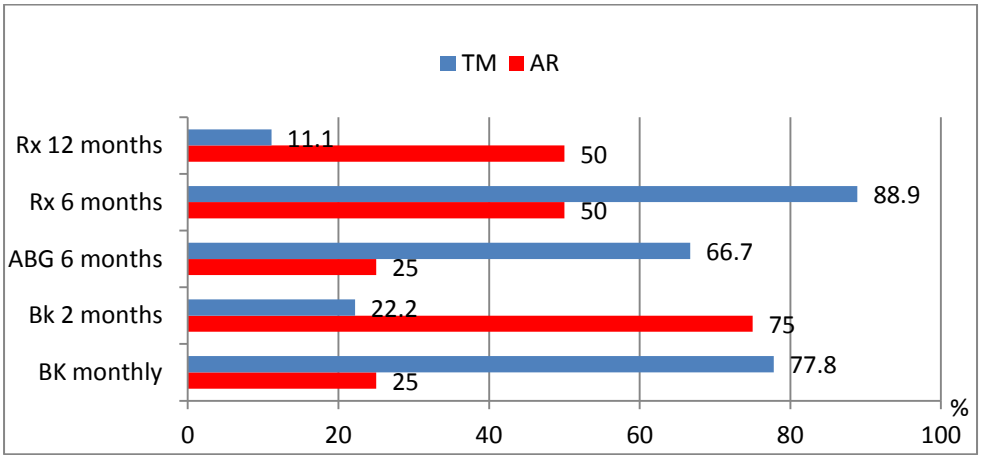


Figure 18. Bacteriological and radiological MDR TB monitoring in all cured and fully treated cases

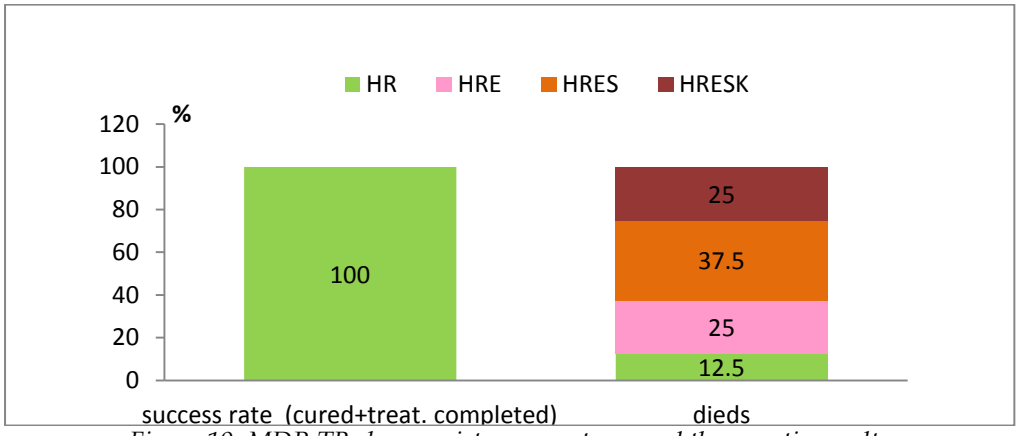


Figure 19. MDR TB chemoresistance spectrum and therapeutic results

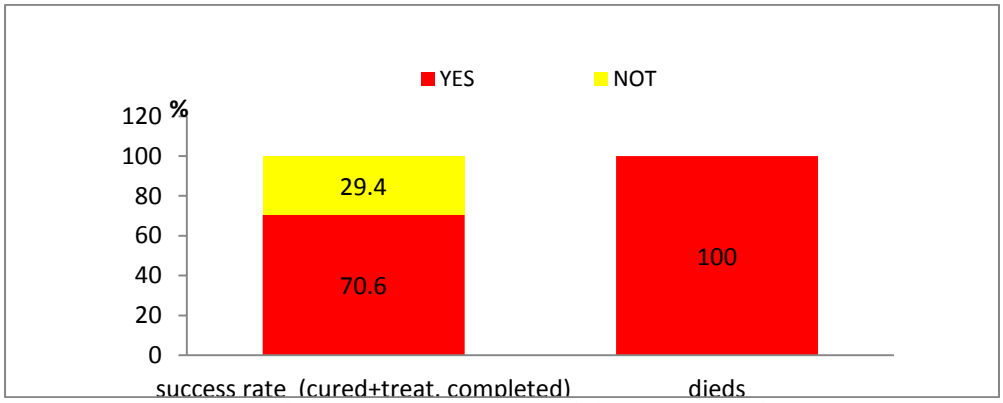


Figure 20. Hospitalisation in sanatoriums and therapeutic results in MDR TB

CONCLUSIONS

The study showed that both the monitoring (bacteriological and radiological) of MDR TB and the length of administered treatment for the cases assessed as cured/full treatment varied widely both from the WHO

recommendations and from those of the National Guide.

The low therapeutic success rate and the high death rate mainly depended on the chemoresistance spectrum and not on the isolation conditions in sanatoriums of sections of pneumophthisiology.

The main cause of therapeutic failure and abandon was the patients' non-compliance, as well as discontinued monitoring due to either the patient (non-compliance) or to the faulty healthcare system (insufficient funding for investigations according to WHO recommendations).

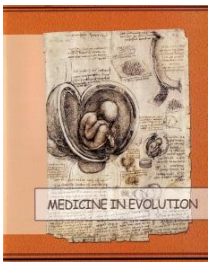
Recommendations based on the results of the study:

— observing current criteria (WHO and national guide) for the diagnosing, monitoring, treatment and assessment of MDR cases and ensuring appropriate funding;
— testing anti-TB drug sensitivity for all the new cases, regardless whether they present suggestive chemoresistance criteria or not
— a more effective cooperation with the NRL to get a faster BGA result in order to initiate fast and proper treatment;
— increasing compliance to treatment by permanent counselling, developing a "treatment partnership"with the patient, using written information about the disease, a treatment plan, monitoring, and the management of adverse reactions to the medication;
— education - information campaigns among the population, regarding MDR TB.

REFERENCES

1. Caminero JA- Management of multidrug-resistant tuberculosis and patients in retreatment. European Respiratory Journal 2005
2. Canetti G.- Present aspects of bacterial resistance in tuberculosis. Am Rev. Respiratory Disease 1965
3. Didilescu C, Marica C-Tuberculoza in Romania-breviar epidemiologic, editia a 2-a,Editura Curtea Veche 1998,Bucuresti
4. Lessnau KD, Orah S,-Multidrug resistant tuberculosis in pregnancy: case report and review of the literature-Chest 2003
5. Loddenkemper R, Sagebied D, Brendel A,-Strategies against multidrug resistant tuberculosis.European Respiratory Joural 2002
6. Marica C, Didilescu C, Chiotan D,Galie N, Tanasescu M, Popescu-Hagem M, Popa M,-Tuberculoza multidrog rezistenta in Romania in ultimii ani (2004-2007)-un fenomen social de maxima importanta., Revista Pneumologia 2008.
7. Ministerul Sanatatii- Institutul de Pneumologie Marius Nasta-Managementul tuberculozei multidrog-rezistente. Bucuresti 2005
8. Riska PF, Jakobs WR Jr, Alland-Molecular determinants of drug resistance in tuberculosis.In Journal Tuberculosis Lung Disease 2000.
9. World Health Organization. Treatment of tuberculosis: guidelines—4th ed.2009.
10. World Health Organization. Global tuberculosis control: WHO report 2011.

INSIGHT IN SCHIZOPHRENIA SPECTRUM DISORDERS: THE PATIENT'S VERSUS THE PSYCHIATRIST'S PERSPECTIVE



CRISTINA BREDICEAN[1], MONICA IENCIU[1], ION PAPAVA[1], RADU ROMOSAN[1], CATALINA GIURGI-ONCU[1], ROXANA MIHALCEA[2], MARINELA HUMUZ[3]

[1] University of Medicine and Pharmacy „Victor Babeş"Timişoara
[2] PhD student University of Medicine and Pharmacy „Victor Babeş"Timişoara
[3] „Eduard Pamfil"Psychiatric Clinic Timisoara

ABSTRACT

Introduction: *The level of insight in psychotic disorders is very important both for the patient and the doctor, as it can influence the evolution of the disease.*

Objectives: *Evaluation of insight at subjects with schizophrenia and schizoaffective disorder, from the patient and the doctor's perspective.*

Material and method: *83 subjects with schizophrenia and schizoaffective disorder were evaluated, using the following scales: Birchwood Insight Scale and PANSS - G12 item.*

Results: *The majority of the subjects had a high level of insight, a better insight at the subjects with schizoaffective disorder being observed. There is an objective overlap between the insight evaluated by the doctor ad by the patient.*

Conclusions: *Subjects with schizoaffective disorder have a higher level of insight compared to the ones diagnosed with schizophrenia. Comparing the insight evaluated by the psychiatrist and the one evaluated by the subject, we can observe that the subjects could objectively appreciate their level of insight.*

Key words: *schizoaffective disorder, schizophrenia, insight*

Correspondence to:

Dr. Cristina Bredicean
MD, PhD
Address: Discipline of Psychiatry, Department of Neuroscience, University of Medicine and Pharmacy "Victor Babes"Timisoara, Eftimie Murgu Square, no. 2, 300041
Phone: +4 0256204400
E-mail address: cristinabredicean@yahoo.com

INTRODUCTION

Everyone who gets in contact with persons who have a psychotic pathology can observe the absence of their capacity to recognize that some of the thoughts they have are part of a disease and that these thoughts exist only in their mind and not in reality. This aspect is called insight.

During time, many researchers tried to define insight. It was initially defined as a one-dimensional concept and, at present, as a multidimensional one. David (1) suggested that insight has three dimensions: the person's awareness that he has a psychic disorder, awareness of treatment necessity and of the fact that the symptoms are part of a disease. The other concept was proposed by Amador and co. (2), including 2 components: the incapacity of recognizing the disease and the incorrect attribution of the consequences determined by the disease.

The majority of the clinical studies on insight's assessment were made on subjects who had the diagnosis of schizophrenia and very few on affective disorders. These studies tried to evaluate the connection between insight, symptoms, neurocognitive functions and social functioning. The interest for the concept of insight grew in the last years due to its role in the clinical evolution of psychosis: the role of a clinical modulator for treatment adherence, but also as a factor for assessing prognosis. The present clinical studies show that in psychosis (especially in schizophrenia) there is a deficit of insight. Its mechanism is not very clear. There are more hypothesis in this direction: the involvement of neurocognitive mechanisms (3,4), psychological processes or psychopathological mechanisms (5).

The assessment of insight can be made using scales that can be filled by the subject (self-evaluation), by the evaluator (doctor) or by a family member. From a longitudinal perspective, the level of insight is very important for the patient and also for the doctor, because it influences the evolution of the disease. A low insight leads to a low treatment adherence, which can lead to the occurrence of a new episode of psychosis.

Objectives

We made a transversal study on subjects with schizophrenia spectrum disorders, aiming to answer three questions:

1. Is there a connection between the intensity of the symptoms and the level of insight?
2. Does the patient's evaluation of insight correspond to the one made by the psychiatrist?
3. Are there differences between insight in schizophrenia and insight in schizoaffective disorder?

MATERIAL AND METHOD

We tried to evaluate in this study the insight in schizophrenia spectrum disorders, from the patient's perspective, as well as from the one of the psychiatrist in ambulatory practice. The patients who participated in the study are part of a longitudinal study project on functional psychosis developed in our clinic during 1985-2004.

The research included 83 subjects who were admitted for the first time in the Psychiatric Clinic from Timisoara during 1985-1995, were diagnosed with a first episode of psychosis and are at present diagnosed with schizoaffective disorder or paranoid schizophrenia.

We selected the patients who are currently followed-up by doctors from the Mental Health Centres in Timisoara or from the ambulatory psychiatric offices, so patients who were under treatment from onset until present. Considering the fact that we speak about a clinical population, the sample doesn't claim to be statistically representative and there weren't used randomization sampling or rating techniques. We used inclusion and exclusion criteria.

Inclusion criteria: the diagnosis at the moment of evaluation (present diagnosis), according to ICD-10 criteria of: Paranoid schizophrenia (F20.0) and Schizoaffective disorder (F25); at least 15 years of evolution since the first episode of psychosis; age at the moment of evaluation under 60; the subjects were capable of and wanted to collaborate with the evaluator. An informed consent to participate in the study was obtained from the subjects; a stable residence in Timis county; active evaluation of the cases in the Mental Health Centre Timisoara and in the ambulatory psychiatric offices in Timisoara.

Exclusion criteria: age at the moment of evaluation over 60, the evolution of the disease less than 15 years; the presence of associated psychiatric disorders (mental retardation, alcoholism, personality disorders); the subject's state at the moment of evaluation did not permit obtaining reliable data or the patient did not consent to participate in the study.

We have to mention that, where necessary, we used the conversion tables of ICD-9/ICD-10, because the diagnosis at onset was established according to ICD 9.Considering the ambiguity of the clinical criteria (ICD-10 or DSM IV criteria) for schizoaffective disorder, it is very important to define the clinical profile of the subjects who participated in the study. At present, the subjects are diagnosed with schizoaffective disorder, at onset they had a diagnosis of psychosis, but not schizoaffective disorder. Until the diagnosis of schizoaffective disorder was established, the existence of pure schizophrenic episodes, pure affective episodes (manic, depressive or mixed) or acute psychotic episodes was accepted. After the diagnosis of schizoaffective disorder was established, no other models of psychotic episodes were accepted, except for schizoaffective ones. During the last 10 years of evolution, the subjects only had schizoaffective episodes.

The general data was obtained from clinical interviews and from the register of cases. The following scales were used: the Birchwood Insight Scale and PANSS- G12 item for the evaluation of insight. The Birchwood Insight Scale is a self-evaluation instrument which has 8 items and evaluates the three dimensions of insight: awareness of symptoms, awareness of illness and the need for treatment. The scores are the following: range 0-8 for poor/low insight, range 9-12 for mean insight and range 13-16 for good/high insight. The PANSS Scale includes the G12 item for the insight's evaluation. This item was evaluated by the psychiatrist who does the follow-up of the patients in the ambulatory. Each item is defined in detail and is evaluated on a scale with 7 points, according to severity, from absent to severe.

Statistical analysis: data obtained from the analysis of the patients' files were grouped and quantified. There were categorical, as well as numerical data. When possible, we preferred the numerical quantification of data, for a more detailed analysis. The scales were applied according to the specific instructions of each instrument. Data were obtained in the form of numerical scores and were interpreted following the instructions. An informed consent form was obtained from every participant in the study. Taking into

account the small number of cases from each sample, we used nonparametric tests. The descriptive statistic included: frequencies, cumulative frequencies, mean values and standard deviations, specific and cumulative statistical weights. The statistical significance level (p) was considered $p<0.05$, which corresponds to a level of trust of 95%.

RESULTS

The subjects were divided in two samples, according to the clinical diagnosis: a sample with the diagnosis of schizophrenia and the other with schizoaffective disorder.

Table 1. Socio-demographical characteristics

Characteristics	Sample with schizophrenia	Sample with schizoaffective disorder
Mean age at onset	25.64 (std.dev. 5.69 years)	25.45 (std. dev. 6.17 years)
Gender male female	19 20	18 26
Education • 8 grades • 10 grades • High school • University Mean value of the school years	 1 15 22 1 11.01	 0 3 41 0 11.7
Professional status • Employed • Unemployed • Retired (disease)	 0 0 39	 1 0 42
Marital status • Married • Not married • Divorced	 12 25 2	 17 21 6

Most of the subjects with schizophrenia had a high level of insight (24 cases – 61.5%).

Table 2. Insight in the sample with schizophrenia

Schizophrenia sample				
Birchwood's scale item General insight	**Number**	**Cumulative number**	**Percentage**	**Cumulative percentage**
Low insight	3	3	7.6923	7.6923
Medium insight	12	15	30.7692	38.4615
High insight	24	39	61.5385	100.0000

Table 3. Evaluation of insight by the subject's psychiatrist

PANSS G12 item – Impairment of the level of patient's awareness or understanding concerning his condition of a person with mental disorders and specific life situations.	Schizophrenia sample			
	Number	Cumulative number	Percentage	Cumulative percentage
Minimal	6	6	15,38462	15,3846
Light	13	19	33,33333	48,7179
Moderate	11	30	28,20513	76,9231
Severely moderate	8	38	20,51282	97,4359
Severe	1	39	2,56410	100,0000
Extreme	0	39	0.00000	100.0000

Between all the items of Birchwood Insight Scale and PANSS G12 item there are statistical significant differences, aspect that shows the fact that generally there is an overlap between the insight evaluated by the doctor and by the patient.

Most of the patients with schizoaffective disorders have a good level of insight (25 cases – 56.8%).

Table 4. Insight in the sample with schizoaffective disorder

Sample with schizoaffective disorder				
Birchwood Insight Scale item – General insight	Number	Cumulative number	Percentage	Cumulative percentage
Low insight	5	5	11.3636	11.3636
Medium insight	14	19	31.8181	43.1817
High insight	25	44	56.8181	100.0000

Table 5. Evaluation of insight by the subject's psychiatrist

PANSS G12 item – Impairment of the level of patient's awareness or understanding concerning his condition of a person with mental disorders and specific life situations.	Sample with schizoaffective disorder			
	Number	Cumulative number	Percentage	Cumulative percentage
Minimal	1	1	2,27273	2,2727
Light	21	22	47,72727	50,0000
Moderate	17	39	38,63636	88,6364
Severely moderate	5	44	11,36364	100,0000
Severe	0	44	0.00000	100.0000
Extreme	0	44	0.00000	100.0000

We can observe that, in general, the subjects with schizoaffective disorder have a better insight than the ones with schizophrenia, but the differences are not statistically significant.

Table 6. Comparison of insight between the two samples

Insight Scale item	Sample:		Statistical difference and significance		
	Schizoaffective disorder	Schizophrenia			
	Mean value	Mean value	Max. Neg. Diff.	Max. Pos. Diff.	Difference significance (p)
General level of insight	13,04545	12,25641	-0,047203	0,179487	p >.10 Insignificant

DISCUSSIONS

In general, the socio-demographical parameters are alike the ones in the speciality literature. The subjects with schizoaffective disorder and the ones with schizophrenia have the same mean age at onset, without any statistically significant differences. For more than 85% of the subjects the age at onset was in the range of 18-32 years old. Considering gender, there are more women with schizoaffective disorder than men, in congruence with the majority of studies. Our study has no epidemiological value, because it was not used a statistical method for the subjects' inclusion in the sample. The mean level of education is fairly the same -11 years, which corresponds to a medium education level. The professional functioning is poor, almost all subjects being retired secondary to the disease. We must

correlate this fact with the clinical presentation of the disease, but also with the social status of our country. Family status reveals that most subjects are not married, with a higher percentage in the schizophrenia subjects, a predictable fact, due to the age at onset and the clinical presentation.

Insight represents the capacity of the subjects to distinguish between normal and pathological experiences, the awareness that he/she is sick and needs treatment. The scale used in this study is a self evaluation one and thus we considered that the opinion of the psychiatrist that currently conducts the case is important. In the sample with schizoaffective disorder, the insight is present at the majority of the subjects (56.8%); the same in the sample with schizophrenia (61.5%). This aspect is very important, as it demonstrates that the subjects have a very clear perception regarding the illness, the symptoms and the necessity of a treatment. The presence of insight may be the consequence of the long evolution of the psychiatric pathology and of psycho-education.

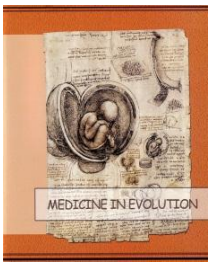
We found statistically significant correlations between all the items of the Birchwood Scale and the PANSS G12 item, which proves that between the insight appreciated by the psychiatrist and the one subjectively evaluated by the patient is an objective overlapping. When considering the longitudinal evolution of psychosis, these statistically significant correlations are important, as insight is an important prognosis factor, a high level of insight being a factor for positive outcome. We observed a higher insight level of the subjects with schizoaffective disorder compared to those with schizophrenia. We anticipated this finding, as the affective component involves a higher level of cognition, thus a higher level of insight.

CONCLUSIONS

We can say that the subjects with schizoaffective disorder have a higher capacity of recognising the symptoms and the necessity of treatment compared with the ones with schizophrenia.There is an objective overlapping of the subject's and the psychiatrist's evaluation of insight.

REFERENCES

1. David AS. Insight and psychosis. Br J Psychiatry 1990; 156:798-808.
2. Amador XF, Strauss DH, Yale SA, Flaum MM, Endicott J&Gorman JM. Assessment of insight in psychosis. Am J Psychiatry 1993; 150:873-9.
3. Aleman, A., Agrawal, N., Morgan, K.D. & David, A.S. (2006) Insight in psychosis and neuropsychological function: Meta-analysis. British Journal of Psychiatry, 189(3), 204–212.
4. Cuesta, M.J., Peralta, V., Zarzuela, A. & Zandio, M. (2006) Insight dimensions and cognitive function in psychosis: A longitudinal study. BioMed Central Psychiatry, 6(1), 26.
5. Cooke, M.A., Peters, E.R., Kuipers, E. & Kumari, V. (2005) Disease, deficit or denial? Models of poor insight in psychosis. Acta Psychiatrica Scandinavica, 112(1), 4–17.



CLINICAL ASPECTS IN ACUTE AND TRANSIENT PSYCHOTIC DISORDERS AND IN PARANOID SCHIZOPHRENIA - COMPARATIVE STUDY

CHRISTOS FIORAKIS[1], ION PAPAVA[2], CRISTINA ANA BREDICEAN[2], VIRGIL RADU ENATESCU[2], RADU STEFAN ROMOSAN[2], LARISA BURCA[3], DULEA IRINA[3], COSMIN ADRIAN ILIE[4], SORANA RALUCA PAPAVA[5], MIRCEA TIBERIU[6]

[1]Department of Neuroscience, Discipline of Child and Adolescent Neuropsychiatry- PhD Student, "Victor Babes"University of Medicine and Pharmacy, Timisoara, Romania
[2]Department of Neuroscience, Discipline of Psychiatry, "Victor Babes"University of Medicine and Pharmacy, Timisoara, Romania
[3]"Eduard Pamfil"Psychiatry Clinic, Timisoara, Romania
[4]Department of Anathomy and Embryology, University of Medicine and Pharmacy "Victor Babeș"Timișoara, Romania
[5]S.C. Terapeutica S.A, Chisineu Cris, Arad, Romania
[6]"Victor Babes"University of Medicine and Pharmacy, Timisoara, Romania

ABSTRACT

Introduction: *acute and transient psychotic disorders are diagnosed entities, which are still in the process of crystallization.*

Objectives: *The analysis of clinical aspects in a group of subjects with acute and transient psychotic disorders compared to a group of subjects with paranoid schizophrenia.*

Material and Methods: *Two groups of 41 subjects were selected. The first group with acute and transient psychotic disorders (ATPD) and the second group with paranoid schizophrenia, in which we analyzed the recurrence of psychotic and affective symptoms during admissions, and the first 5 years after the onset.*

Results: *There are significant differences in the frequency of the other than running commentary auditory hallucinations, visual and tactile hallucinations, as well as delusions of being followed, persecutory and sensitive relational delusions are frequently in the group with paranoid schizophrenia.*

Conclusions: *The clinical symptoms revealed significant differences between the two entities.*

Key words: *clinical, symptoms, psychosis*

Correspondence to:

Papava Ion
Address: Clinica de Psihiatrie "Eduard Pamfil"Timisoara, 21 I. Vacarescu, Str., 300 128, Timisoara, Romania
E-mail address: papavaion@yahoo.com

INTRODUCTION

Acute and transient psychotic disorders were, from the beginning, a group of psychosis, which is difficult to enclose and describe, being a heterogeneous group of psychosis defined under different names in different geographical regions. Currently, both the ICD 10 (International Classification of Diseases) and DSM IV-TR (Diagnostic and Statistical Manual of Mental Disorders) have brought them together under the term "acute psychotic disorders", acute and transient aspects being characteristic in their identity as psychosis. Most existing studies on these psychoses were made on their regional version (cycloid psychosis, reactive psychosis, "bouffee delirante", atypical psychosis, etc.) and less on current classification concept, which is revealed in the ICD 10 (1) or DSM IV (2).

Thereby, descriptive data available on this concept are scarce. Since their defining, they were found to be different from the main typical psychoses (schizophrenia and periodic affective disorders) although their symptomatology includes common symptoms. Their reporting to schizophrenia, defined them as psychoses with a better outcome. It is significant for subjects with these psychoses that some of them may evolve over time to different types of psychosis. Their percentage varies from one study to another, a high diagnostic stability over time was observed especially in developing countries. (3)

MATERIAL AND METHOD

Our study included 82 subjects who had their first admission in the Psychiatric Clinic of Timisoara between 2005 thru 2008, which were divided in two distinct groups. The first group included 41 subjects diagnosed with acute and transient psychotic disorders (ATPD) that have not changed their diagnosis during follow-up and the second consisting of the same number of subjects diagnosed with paranoid schizophrenia.

Inclusion criteria consisted of:

— For both subjects groups, the first admission within a psychiatric department should have been in the Psychiatric Clinic of Timisoara, between 2005 thru 2008.
— The age of the subjects during their first admission should have been between the ages of 18 and 65 years old.
— Clinical diagnosis according to ICD 10 WHO, must be acute and transient psychotic disorders for subjects of the first group and for those in the second group it must be paranoid schizophrenia diagnoses, which had to be maintained during the 5 years of evolution;
— We have an active consult in the mental health centers of Timisoara and outpatient psychiatric practice in Timisoara;
— We have voluntary participation, without any sort of motivation from researchers.

The subjects with a history of alcohol or drug abuse were excluded from the study.

The establishment of the group's dimension began with the number of subjects with acute and transient psychotic disorder that met the criteria mentioned above. It was recorded for each subject the manner that psychotic and affective frequency of symptoms, which were recorded in the patients' hospital admissions, changed during the mentioned evolution. Thereby, first rank Kurt Schneider's symptoms were

recorded (hearing thoughts, auditory hallucinations, running commentary or talk to each other about the patient to a third person, theft and thought insertion, diffusion of thought, delusional perceptions or external influence phenomena), the frequency of tactile, olfactory, gustatory, other than running commentary auditory and visual hallucinations and various types of delusions (bizarre, erotomanic, persecutory, sensitive relational, religious/mystical, jealousy, hypochondriac, megalomaniac, depressive, trance and possession, delusions of being followed) and the frequency of affective symptoms (dysthymic depression/euphoria) over admissions during the investigated five years of evolution.

Data was obtained from patient's charts analysis and after discussions with patients and their physicians. Data was both quantitative and qualitative.

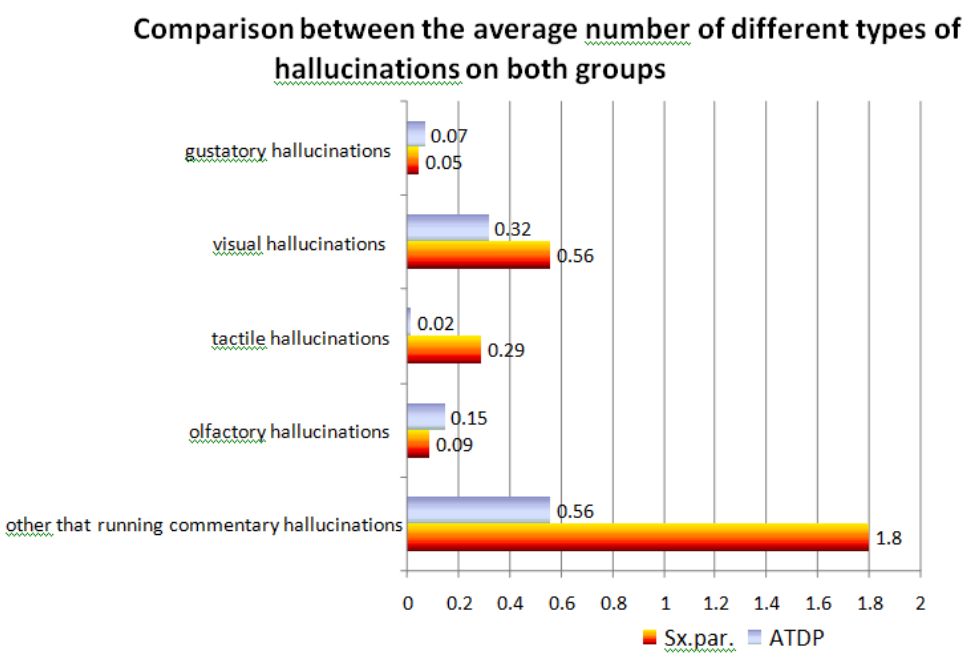
We used a non-parametric comparison test Mann- Whitney. Descriptive statistics were calculated (means, frequencies, percentages).

RESULTS

The group of patients with acute and transient psychotic disorders includes 22 women (53.6%) and 19 men (46.4%), and paranoid schizophrenia's group includes 23 women (56.1%) and 18 men (43.9%).

Regarding symptoms in the analyzed groups, paranoid schizophrenia subjects had significantly more episodes of illness with first rank Kurt Schneider's symptoms during the five years of disease evolution, than subjects with acute and transient psychotic disorders. The average number of episodes is more than double for patients with schizophrenia (1.5 versus 0.6). By means of Mann-Whitney comparison test, we obtain an obvious statistically significant difference. ($Z = 3.212$, $p = .00$).

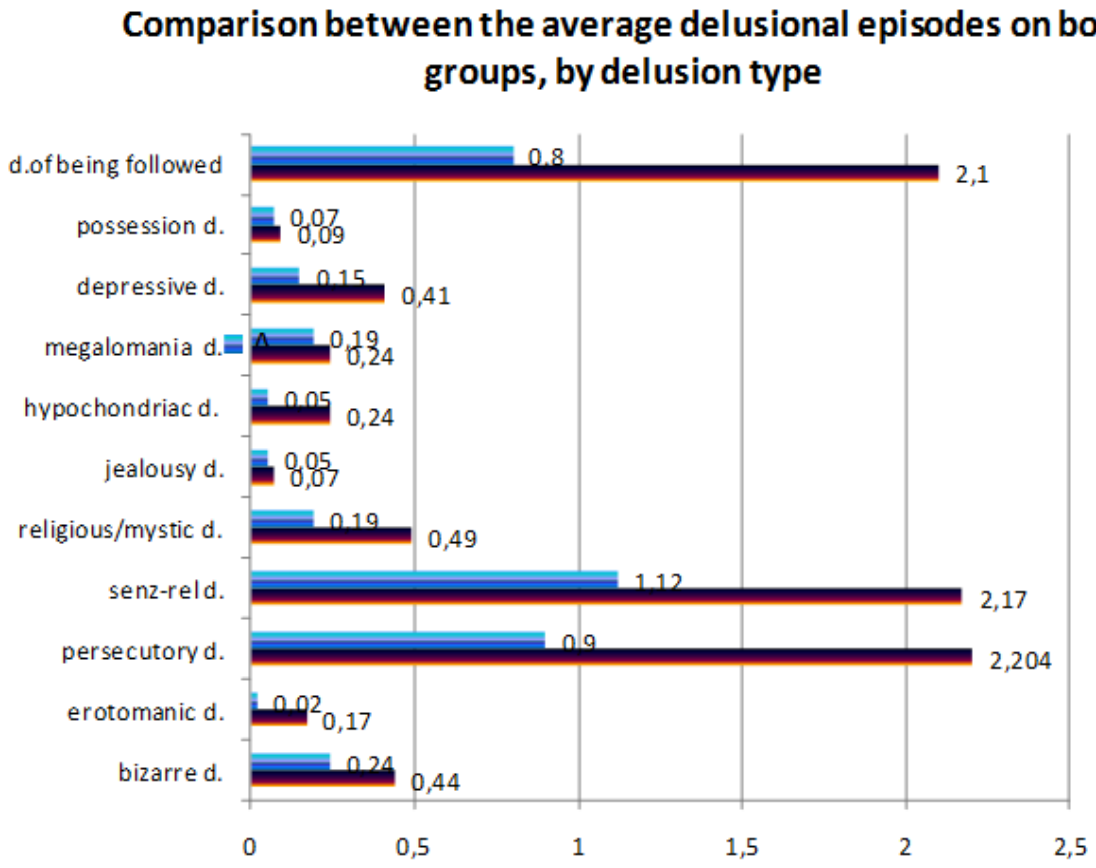
Regarding the average frequency of the hallucination types we have a statistically significant difference regarding the average number of episodes of auditory hallucinations ($Z = 3.87$, $p = 0.000$) and tactile hallucinations ($Z = 2.27$, $p = 0.02$) between the two groups, last mentioned symptoms were significantly higher on subjects with paranoid schizophrenia.



In the ATPD group, olfactory and gustatory hallucinations were more frequent per episode, compared to the other group, but the difference was not statistically significant.

In both groups other than running commentary auditory hallucinations prevailed (60% of hallucinations on patients with schizophrenia and 50% with ATPD) and visual hallucinations. We also observed that persecutory delusions, sensitive-relational and delusions of being followed, prevailed in the analyzed groups.

The Mann-Whitney test revealed the existence of a statistically significant difference between the number of delusional episodes with persecutory delusions (Z = 4.53, p = 0.00), relational sensitive delusions (Z = 2.85, p = 0.002), and delusions of being followed, (Z = 4.05, p = 0.00) in all those cases, the number of episodes were higher in patients with paranoid schizophrenia than in patients with ATPD. Erotomanic delusion was more frequently encountered at subjects with paranoid schizophrenia, but the difference was not statistically significant.

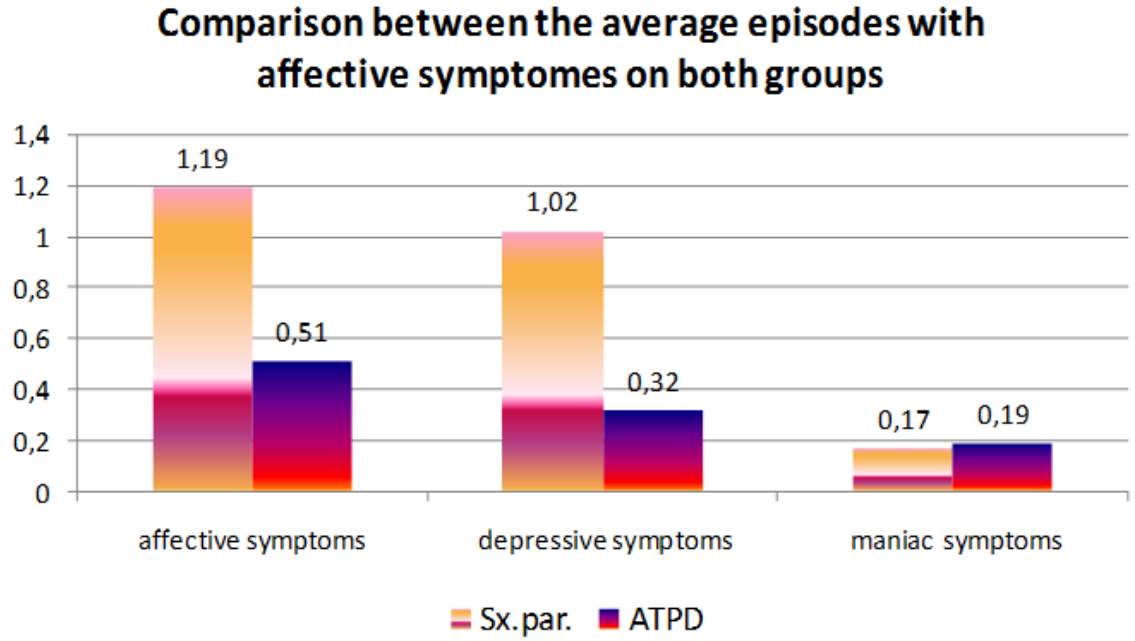


Regarding the presence of affective symptoms, the differences between the average episodes of affective symptoms (depression / mania) in both groups were not statistically significant (Z = 1.89, p =.06).

Depressive symptoms were more common in patients with paranoid schizophrenia and maniac symptoms in patients with acute and transient psychotic disorder, but the differences were not statistically significant. Also, overall, affective symptoms are more frequent in schizophrenic patients than those with ATPD, but this is due to a higher number of admissions in patients with schizophrenia.

Related to the number of relapses in the analyzed period, the affective symptoms were present on an average of 34.9 % in patients admitted with

paranoid schizophrenia and 49.3 % in patients admitted with ATPD, which indicates a higher rate of affective symptoms of ATPD patients than in those with paranoid schizophrenia.



DISCUSSIONS

Although the psychotic symptoms were described as common for the analyzed entities, differences are expected to be found in the clinical plan, given the fact that we have different entities. Some authors suggest that in the clinical plan the only difference between schizophrenia and acute and transient psychotic disorders is made by negative symptoms (4)

In this paper the analyzed symptoms were determined from the beginning, with their recording in hospital admissions. We considered only the productive symptoms and we overlooked the disorganized or negative ones. It also should be noted that just paranoid schizophrenia cases were taken in the second group, considered to be the closest clinical form of acute and transient psychoses.

So, we tried to see what clinical differences we find only in terms of productive and affective symptoms between the two entities.

Also, the literature, when analogy between the clinical presentations of the two entities were made, first rank Kurt Schneider 's symptoms, although mentioned as occurring in both psychiatric conditions, have been described as more common in those with paranoid schizophrenia (5, 6), which is revealed in our study. This fact is explained by the clinical definition of paranoid schizophrenia, which supposes high percentage of their presence, while in acute and transient psychosis; their presence is only defining their specific forms (polymorphic psychotic disorder symptoms of schizophrenia - F23.1 and acute schizophrenia -like psychotic disorder - F23.2).

In both groups the most common types of hallucinations were the other than running commentary auditory hallucinations, visual and tactile hallucinations, with significant differences between the two groups only for the other than running commentary auditory and tactile hallucination, meaning their more frequent occurrence in patients with paranoid schizophrenia.

Regarding the types of delusion, the most common for both groups were the same types of delusions: persecutory, sensitive- relational, delusion of being followed. Significant differences between the two groups regarding the types of delusions were all of the above. These were more common in the group of subjects with schizophrenia, as well as other types of delusional themes, mentioning that there were no significant differences between groups.

Overall, our results match with those of previous studies that followed this clinically aspect. Thus, Sajith et al (2002) reported on 45 subjects with acute polymorphic psychotic disorder, followed during three years of evolution, that auditory hallucinations (auditory hallucinations other than the running commentary hallucinations and the third person) are the most common hallucinations. The most common theme was the persecutory delusion, first rank symptoms being excluded by definition from this group. Auditory hallucinations were present in 91.1 % of subjects, and persecutory delusions in 82.2 %. (7)

In Jorgensen' s retrospective study on 17 subjects with ATPD and 43 subjects with paranoid schizophrenia, during 8 years of evolution, the main theme of the first subjects was the delusion of reference, and to those with paranoid schizophrenia were the persecutory delusion and the influence delusion (8). The influence delusion was treated here separately and was not included in Kurt Schneider's first-rank symptoms, as we established in our study. The interesting fact is that, regarding the subjects with acute and transient psychotic disorders; the most common type of delusion is represented by the reference delusion.

In the HASBAP study, made on 42 subjects with ATPD and the same number of subjects with paranoid schizophrenia, delusions were relatively equal regarding frequency, except for the delusion of influence, which was more frequent in the group with schizophrenia. The hallucinations frequency was significantly higher in those with paranoid schizophrenia. It also refers to a high first rank Kurt Schneider's symptoms frequency in both groups as well as dysthymic depression. Maniac symptoms were more common in ATPD, but the difference was not statistically significant. The same fact was observed in our study regarding maniac dysthymia, but the depressive dysthymia was more frequent in patients with paranoid schizophrenia.

Although, they are less common than in the group with schizophrenia, in the group with ATPD, auditory hallucinations were the most common type of hallucination, followed by the visual and haptic delusions. This is also revealed in our study. The most common types of delusions were the reference and persecutory delusions (subjects with ATPD). (9)

Regarding Kurt Schneider's first rank symptoms, while occurring in both psychiatric conditions, they have been described as being more common in those with paranoid schizophrenia, aspect also revealed in our study (5.6)

CONCLUSIONS

Regarding psychotic and affective symptoms, we found significant clinical differences between the two groups, regarding Kurt Schneider's first-rank symptoms, other than running commentary auditory and tactile hallucinations, persecutory delusions, delusion of being followed and sensitive-relational, in terms of their common occurrence on patients with paranoid schizophrenia. This highlights a better stability on schizophrenics over time and an inconsistent evolution on those with acute and transient psychotic disorder.

Given that schizophrenia is an entity that has been extensively studied, our results are not significant for this. Instead they come to complete the so far existing data, for acute and transient psychotic disorders, which is an undergoing crystallization entity, in the new classification for

From the latter clinical point of view, further studies are needed to address an extensive symptomatology and not just their defining symptoms.

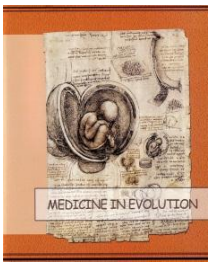
LIMITATION

The initial establishing of symptoms, which will be accounted, excluding those of disorganized or negative types, as well as the relatively small number of subjects of both groups, are the main limitations of the study.

REFERENCES

1. ***ICD-10.Clasificarea tulburărilor mintale şi comportamentale, simptomatologie şi diagnostic clinic. Editura All, Bucureşti, 1998.
2. *** *Diagnostic and Statistical Manual of Mental Disorders, 4th edition. Text Revision (DSM-IV-TR).* Washington D.C.: American Psychiatric Association, 2000.
3. Castagnini A., Berrios GE. Acute and transient psychotic disorders (ICD-10 F23): a review from a European perspective. *Eur Arch Psychiatry Clin Neurosci* (2009) 259:433–443.
4. Jager M, Bottlender R, Strauss A, Moller HJ. On the descriptive validity of ICD-10 schizophrenia: empirical analyses in the spectrum of non-affective functional psychoses. *Psychopathology* 2003; 36:152-159.
5. Jorgensen P, Bennedsen B, Christensen J and Hyllested A. Acute and transient psychotic disorder: a 1-year follow-up study. Acta Psychiatr Scand 1997;96:150-154.
6. Marneros A, Pillmann F. The long-term outcome. In: Marneros A, Pillman F. *Acute and transient psychosis.* Cambridge: University Press,2004,143-156.
7. Sajith SG, Chandrasekaran R, Sadanandan Unni KE and Sahai A. Acute polymorphic psychotic disorder: diagnostic stability over 3 years. *Acta Psychiatrica Scandinavica* 2002;105:104-109.
8. Jorgensen P. Course and outcome in delusional disorders. *Psychopathology* 1994; 27:79-88.
9. Marneros A, Pillmann F. Clinical features of the acute episode. In: Marneros A, Pillman F. *Acute and transient psychosis.* Cambridge: University Press,2004,103-119.

ENDOTHELIAL DYSFUNCTION AND METABOLIC CARDIOVASCULAR RISK IN ESSENTIAL HYPERTENSION



EMILIA DANA BÂIBÂȚA[1], MARIA RADA[1], SIMONA DRAGAN[1], SILVIA MANCAȘ[1]

[1] University of Medicine and Pharmacy „Victor Babeş"Timişoara

ABSTRACT

The Oxidative stress (OS), defined as excessive imbalance between the production of free radicals of oxygen (RLO) and the antioxidant defense mechanism of the body, is involved in the development of cardiovascular lesions. The first changes in the arterial wall can be diagnosed using noninvasive methods: determining biochemical markers and ultrasound B-mode of the carotid artery.

The aim of the study: *To evaluate the endothelial dysfunction in subjects with metabolic risk using FormOx and c-IMT.*

Material and methods: *The study included consecutive cases of patients with metabolic syndrome without symptomatic cardiovascular disease, hospitalized in The of Preventive Cardiology and Cardiovascular Rehabilitation Clinic of Cardiovascular Diseases Institute Timisoara. We evaluated parameters of metabolicsyndrome, the blood pressure profile, the cardiovascular risk factors and the endothelial function.*

Results: *the average of FormOx was significantly higher in hypertensive than in normotensive patients (p-value = 0.014, unpaired t test, 95% CI); mean c-IMT was significantly higher in the hypertensive group (c-IMT =0.636) compared with normotensive (c-IMT = 0.542) (p = 0.043, unpaired t test, 95% CI); we obtained a direct statistically significant correlation between LDLc and FormOx (P = 0.044, r = 0.259).*

Conclusions: *we obtained statistically significant correlations between oxidative stress parameters (FormOx) and endothelial dysfunction (characterized by c-IMT) in patients with metabolic syndrome; c-IMT measurement is important for assessing the progression of atherosclerosis in patients with the metabolic syndrome asymptomatic; c-IMT was higher in hypertensive patients with metabolic syndrome; c-IMT and LDLc were directly and significantly influenced by the level of oxidative stress.*

Key words: *endothelial dysfunction, cardio-metabolic risk, oxidative stress, hypertension*

Correspondence to:

Emilia Dana Bâibâța
MD, PhD
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Eftimie Murgu Square, no. 2A, RO-300041, Timisoara
Phone: +4 0745615654, +4 0737034932
E-mail address: danaemilia@yahoo.com

INTRODUCTION

The Oxidative stress (OS), defined as excessive imbalance between the production of free radicals of oxygen (RLO), and the antioxidant defense mechanism of the body, is involved in the development of cardiovascular lesions. The increase in oxidative stress associated with the cardiovascular risk factors, leads to inflammatory damages and increases vascular permeability of endothelial cells for the LDL-cholesterol particles with their oxidation in the arterial intima. The release of profibrotic growth factors which stimulates the proliferation of smooth muscle cells to produce collagen in excess due to plaque formation. This phenomenon causes arterial remodeling with increased intima-media thickness and determined early arterial stiffening.

Endothelial dysfunction precedes the occurrence of clinically vascular events that indicates an advanced stage of atherosclerotic disease. The first changes in the arterial wall can be diagnosed using noninvasive methods: biochemical markers and ultrasound B-mode carotid- carotid intima-media thickness (c-IMT). According to Use of Carotid Ultrasound to Identify Subclinical Vascular Disease and Evaluate Cardiovascular Disease Risk (1) c-IMT is one of the best ways to detect subclinical atherosclerosis stage.

In our study we chose two noninvasive methods for assessing endothelial dysfunction: a method biochemical -FormOx and morphological method- intima-media thickness of carotid ultrasound determined.

THE AIM OF THE STUDY:

a) To evaluate the endothelial dysfunction at subjects with metabolic risk defined as metabolic syndrome using FormOx and c-IMT.
b) To establish the relationship of association between endothelial dysfunction and subclinical atherosclerosis parameters detected by the two methods mentioned above.

MATERIAL AND METHOD

The study included consecutive cases of patients with metabolic syndrome without symptomatic cardiovascular disease, hospitalized in Preventive Cardiology and Cardiovascular Rehabilitation Clinic of the Institute of Cardiovascular Diseases Timisoara in 2008-2010. We evaluated parameters of metabolic syndrome, tension profile, cardiovascular risk factors and endothelial function.

Study criteria:

- charter SCORE European Region with high risk of cardiovascular mortality: risk assessment for fatal cardiovascular event in the next 10 years
- risk hemodynamic parameters:
  - ambulatory BP monitoring: 24h-SBP, DBP-24h, 24h-PP, 24h-TAM
- arterial function parameters:
  - morphological study: determining ultrasound intima-media thickness of the common carotid artery
  - assessing endothelial dysfunction by quantifying oxidative stress (method FormOx)
- biochemical parameters of cardio-metabolic risk: fasting glucose, TC, TG, LDLc, HDLc

Data collection: we accessed clinical observation sheets and provided a detailed assessment of each case, the data were filed electronically for statistical processing. Parameters analyzed included: identification data,

demographic, anthropometric data, anamnesis, complete clinical examination, paraclinical examination.

The assessment protocol: was designed to assess cardiovascular risk and endothelial function in patients with metabolic syndrome. The deployment of this protocol included:

A. The risk for fatal cardiovascular event in the next 10 years using the SCORE equation

for the European zone with high risk of cardiovascular mortality. The variables measured were: age, sex, SBP (mmHg), smoking, total cholesterol (mg / dl). The electronic version of SCORE, www.heartscore.org allowed classification of subjects with metabolic syndrome in two categories: risk SCORE <5% and ≥ 5%.

B. Cardio-metabolic risk: the following variables were analyzed:

a) the basal characteristics: gender, age, waist circumference and body mass index (kg / m)
b) the traditional cardiovascular risk factors

— Hypertension defined according to "The 2007 Guidelines for the Management of Arterial Hypertension"(2) Sort by: TAS ≥ 140 mmHg and / or DBP ≥ 90 mmHg or antihypertensive treatment, which corresponds to an average of 24 hours> 120/80 mmHg.
— Smoke condition: number of cigarettes / day or smoker in the past four weeks.
— Type 2 diabetes mellitus defined according to fasting glucose ≥ 126 mg / dl on two different measurements or oral anti diabetes medication. Units I-or dis-glucose was analyzed according to WHO criteria and those of the American Society of Diabetology (2) and has identified the following situations: (table no. I).

Table I. Classification of glucose metabolism disorders

Category	Fasting glucose/TTGO
euglycemia	< 100 mg/dl
Impaired glucose tolerance	>100 and < 126 mg/dl
Diabetes mellitus	> 126 mg/dl

Guido Grassi,2007

— Hypercholesterolemia, according to NCEP-ATP III (total cholesterol above 200 mg/ dl) (3). For primary prevention recommended target level is below 190 mg / dl, values that exceeded this limit were considered to be a major risk factor. The use of medication was retained as a criterion for diagnosis. Lipids were assessed according to NCEP-ATP III. We took into account the recommendations of "The Guidelines on Cardiovascular Disease Prevention"to characterize primary prevention, the condition of "healthy"(4)
— : LDLc <115 mg / dl, HDLc> 40 mg / dL and TG <150 mg / dl.
— Metabolic syndrome: the criteria defined by the National Cholesterol Education Program-Adult Treatment Panel III (ATP III, 2001) and those developed by the International Diabetes Federation (IDF, 2005), table nr.I

Table II. Metabolic syndrome

CRITERIA	NCEP-ATP III	IDF
Waiste circumference(cm)	>88 (F),>102 (B)	>80 (F),>94 (B)*
Blood pressure (mmHg)	≥ 130/80	≥ 130/80
Fasting glucose(mg/dl)	> 110	> 100
Triglicerydes (mg/dl)	>150	>150
HDL-c (mg/dl)	<50(F),<40(B)	<50(F),<40(B)

Note: if BMI ≥ 30 kg / m² is no longer necessary to determine the waist circumference (IDF)

C. hemodynamic profile: - BP measurement was performed on bilateral arm, following the recommendations of the European Society of Hypertension guidelines for the evaluation and treatment of hypertension (2,5) in a seated position after 5 minutes of rest.
All patients were ambulatory monitoring TA/24h: we used BTL-08 ABPM program. Setting the automatic reading was performed at 15-minute intervals during daytime (7AM-11PM) and every 30 minutes during the night (11PM-7AM).The monitoring was repeated if the first examination showed an increased number of artefacts (> 30%) or if the number of measurements was small. From TA/24h ambulatory monitoring protocol were retained for research following parameters values: 24h-SBP, 24h-PP, 24h-TAM.
D. The arterial function was determined by ultrasound evaluation of intima-media thickness of the carotid artery complex (c-IMT).The c-IMT measurements were performed at the posterior wall of the common carotid artery as recommended by the American Society of Echocardiography (6). The results were expressed as the average of five measurements / artery, made at equal intervals along the entire length of the artery.
E. Endothelial dysfunction was assessed by the FORT method (Free Oxygen Radical Test). Fort test is a colorimetric assay that relies on the ability of transition metals (such as iron to catalyze the decomposition of hydroperoxides into free radicals under Fenton reaction. Testing was performed using FORM-ox machine Callegari, Italy, using capillary blood, patients being fasted for 12 hours. The values over 310 Fort units were considered suggestive of a high level of oxidative stress.

STATISTICAL ANALYSIS

Statistical analysis was performed with EpiInfo software version 6.0,2001 the data was processed with SPSS software, version 18, 2010. Data were filed electronically using Microsoft Excel version 97-03 threshold values of statistical significance $p < 0.05$ were considered statistically significant and $p < 0.01$ highly statistically significant. Data normality was assessed using the Shapiro - Wilk test. The data were analyzed using parametic tests Independent Samples T- test for comparison of means in both groups, and One Way ANOVA comparing means in more than three groups. Testing the association between qualitative variables was performed by chi square test, and to test correlations between numeric variables we used Pearson correlation coefficient. We applied the following statistical tests: Mann- Whitney test, Kendall correlations and multiple regression test.

RESULTS

Metabolic syndrome: epidemiologic profile of traditional cardiovascular risk factors in the study group:

We included in the study 61 patients with metabolic syndrome. The average age was 55.77 ±11.4 years, male (49.2%) and women (50.8%).The general characteristics of the study sample are found in Table No. III.

Table III. Cardiovascular risk factors in the study group

	N	Minimum	Maximum	Mean	Std. Deviation
Age	60	31	76	55.77	11.481
Glicemiamg	61	63.10	269.70	108.2179	38.44012
PP	61	35	100	57.70	13.832
SBP	61	110	190	146.39	19.368
DBP	61	65	120	88.69	10.563
TC	61	143	332	218.11	43.410
TG	61	57	410	181.60	76.547
HDL	61	26	97	51.56	14.787
LDL	61	57	246	129.69	41.460
IMC	60	27	100	35.70	9.638
Waist Circumference	60	89	136	111.07	10.284
FormOxUFort	61	160	567	338.74	88.855
SCORE	61	0	22	5.26	5.209
IMTCarIntStg	60	.405	1.066	.61607	.148917
IMTCarIntDr	60	.378	.943	.57015	.122659

The cardiovascular risk profile of the patients with metabolic syndrome was characterized by the following components:

- Type 2 diabetes mellitus 26.2%
- oral anti diabetes medication 21.3%
- Hypercholesterolemia 67.21%
- smokers 16.4%
- essential arterial hypertension 78.7%

Total cardiovascular risk in the amount of 5.26% resulting from electronic calculation showed an medium risk for fatal cardiovascular event in the next 10 years.

All patients with metabolic syndrome received medication according to the recommendations of the European Society of Cardiology for reducing the cardiovascular risk.

Metabolic syndrome and endothelial dysfunction: analysis of shape variation of the average Form Ox according to normo or hypertensive condition

The average of FormOx was significantly higher in hypertensive than in normotensive patients (p-value = 0.014, unpaired t test, 95% CI) (table.No.IV).

Table IV. FormOx in hypertensive and normotensive group

	HTA	N	Mean	Std. Deviation	Std. Error Mean
FormOxUFort	0	13	**285.54**	95.001	26.349
	1	48	**353.15**	82.339	11.885

Analysis of c-IMT variation depending on the condition of normo or hypertensive.

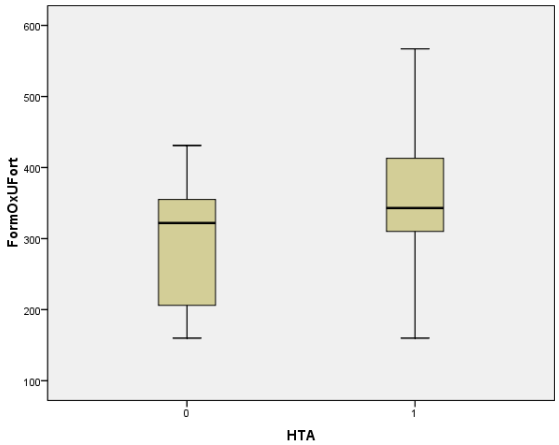


Figure 1. Analysis of FormOx variation at normotensive and hypertensive group.

Mean c-IMT was significantly higher in the hypertensive group (c-IMT =0.636) compared with normotensive (c-IMT = 0.542) (p = 0.043, unpaired t test, 95% CI).(Fig. No.2)

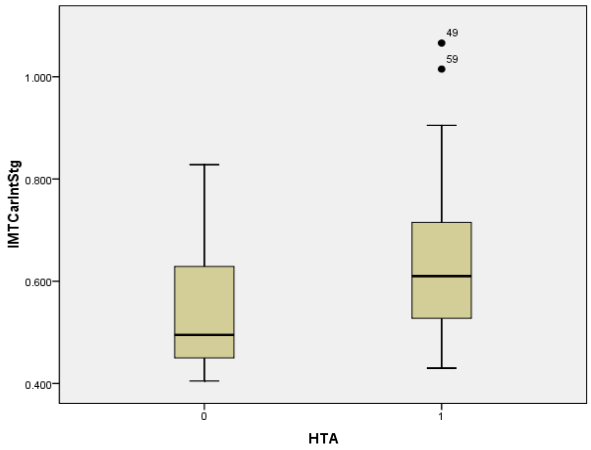


Figure 2. Analysis of c-IMT variation at normotensive and hypertensive group

The metabolic syndrome: analysis of mean LDLc and FormOx:

Mean LDLc in patients with metabolic syndrome analyzed at baseline was 129.75 ± 41.46 mg / dl. We obtained a direct correlation between LDLc and FormOx statistically significant (P = 0.044, r = 0.259)

The relationship between c-IMT and FormOx

We analyzed the correlation between oxidative stress (Form Ox) and endothelial dysfunction by c-IMT assessed by ultrasound measurement, we obtained statistically significant direct correlations to both the left carotid artery(IMTCarIntStg) (P = 0.023, r = 0.294) and the right carotid artery (IMTCarIntDr) (P = 0.006, r = 0.35).

Mathematical linear regression:

We introduced in the mathematical model of linear regression the following variables:

- FormOxUFort dependent variable,
- Independent variables: IMTCarIntDr LDL IMTCarIntStg

We obtained a statistically significant model (p-value = 0.005, ANOVA test, 95% CI), with a linear regression equation:

FormOxUFort = 140.7 +237.14 +0.48 * LDL * IMTCarIntDr, but the value of the coefficient of determination R square of only 0.172, meaning that only 17.2% of the variability was explained by Formox and the model variables (LDL and IMTCarIntDr).

In conclusion, between FormOx, LDL cholesterol and IMTCarIntDr there was a statistically significant

linear relationship, but there were other factors not investigated in this study that influenced the variability of this parameter.

DISCUSSIONS

Our study demonstrates that there is a relationship of association between markers of endothelial dysfunction and metabolic condition defined as metabolic syndrome. Metabolic syndrome in our study was accompanied by significant increase in oxidative stress.

In the ARIC study (Atherosclerosis Risk in Communities Study) has demonstrated that c-IMT increases with age. Cross-sectional analyzes suggest that c-IMT thickening is age dependent in both sexes about 0.010mm/an at the level of common carotid artery.(6,11)

In our study that included patients with metabolic syndrome, even young patients had increased c-IMT so we conclude that the presence of metabolic syndrome may be responsible for increased c-IMT. The measurement of c-IMT is recommended in all epidemiological studies of cardiovascular disease in this case to characterize the cardiovascular risk profile of patients. Thus becoming increasingly important in measuring c-IMT for individuals at moderate risk / low for more accurate framing in cardiovascular risk category.

Vicenzini et all in a recent population-based study on 1,655 people in which the c-IMT was consider as marker of atherosclerotic risk, they found an positive statistically correlation between c-IMT and age. In linear regression model the presence of atherosclerotic plaque and the presence of cardiovascular risk factors were independently correlated with increased c-IMT (7)

In our study the linear regression model clearly demonstrates the existence of a statistically significant correlation between c-IMT and LDLc and between c-IMT and Form Ox. The lipid profile and oxidative stress has a direct effect on atherosclerosis at the external carotid artery.

J.F Polak et al. analyzing the influence of various cardiovascular risk factors on c-IMT emphasizes that 23.5% of the variability in c-IMT is due to age and male sex, and the next factor would be TAS (8). Further evidence supporting the involvement of cellular and molecular changes that characterize carotid intima-media thickness in the development and progression of atherosclerosis (9,10).

CONCLUSIONS

We obtained statistically significant correlations between oxidative stress parameters (FORMox) and endothelial dysfunction (characterized by c-IMT) in patients with metabolic syndrome

c-IMT measurement is important for assessing the progression of atherosclerosis in patients with the metabolic syndrome asymptomatic

c-IMT is higher in hypertensive patients with metabolic syndrome

c-IMT and LDLc directly and significantly influence the level of oxidative stress.

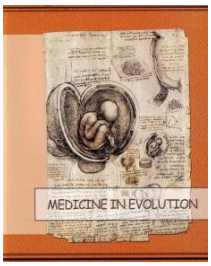
REFERENCES

1. A Consensus Statement from the American Society of Echocardiography Carotid Intima-Media Thickness Task Force *Endorsed by the Society for Vascular Medicine* James H. Stein, MD, FASE, Claudia E. Korcarz, DVM,

RDCS, FASE, R. Todd Hurst, MD, Eva Lonn MD, MSc, FASE, Christopher B. Kendall, BS, RDCS, Emile R. Mohler, MD, Samer S. Najjar, MD, Christopher M. Rembold, MD, and Wendy S. Post, MD, MS, *Madison, Wisconsin; Scottsdale, Arizona; Hamilton, Ontario, Canada; Philadelphia, Pennsylvania; Baltimore, Maryland; and Charlottesville, Virginia*)

2. Mancia G.et.al-The 2007 Guidelines for the Management of Arterial hypertension Europ.Heart J.2007,28,1462-536
3. Campuzano, R., et al., Endothelial dysfunction, intima-media thickness and coronary reserve in relation to risk factors and Framingham score in patients without clinical atherosclerosis. J Hypertens, 2006. **24**(8): p. 1581-8.
4. GM Scott et.al Implications of Recent Clinical Trials, for the National Cholesterol Education Program Adult Treatment Panel Guidelines. Circulation 2004; 110:227-39)
5. Corrado, E., et al., Relationship between endothelial dysfunction, intima media thickness and cardiovascular risk factors in asymptomatic subjects. Int Angiol, 2005. **24**(1): p. 52-8.
   European Guidelines on cardiovascular disease prevention in clinical practice (version 2012). The Fifth Joint Task Force of the European Society of Cardiology and Other Societies on Cardiovascular Disease Prevention in Clinical Practice (constituted by representatives of nine societies and by invited experts). Perk J, De Backer G, Gohlke H, Graham I, Reiner Z, Verschuren M, Albus C, Benlian P, Boysen G, Cifkova R, Deaton C, Ebrahim S, Fisher M, Germano G,Hobbs R, Hoes A, Karadeniz S, Mezzani A, Prescott E, Ryden L, Scherer M, Syvänne M, Scholte op Reimer WJ, Vrints C, Wood D, Zamorano JL, Zannad F;European Association for Cardiovascular Prevention & Rehabilitation (EACPR); ESC Committee for Practice Guidelines (CPG)
6. Vicenzini, E., et al., Common carotid artery intima-media thickness determinants in a population study. J Ultrasound Med, 2007. **26**(4): p. 427-32;quiz 434.
7. MJ Roman et.al American Society Echocardiography-Report. Vasc.Med.2006, 11,201 -11)
8. Vicenzini, E., et al., Common carotid artery intima-media thickness determinants in a population study. J Ultrasound Med, 2007. **26**(4): p. 427-32;quiz 434.
9. 9.Polak J.F et.al- Association of carotid artery intima-media thickness of mean common carotid artery IMT with maxim internal carotid artery IMT. J.Ultrasound Med.2010;29,12:1759-68).
10. Lorenz M.W.et.al-Prediction of clinical cardiovascular events with carotid intima-media thickness: a systematic review and meta-analysis. Circulation,2007,115:459-67;
11. Chambless L.E et.al-Coronary artery disease risk prediction in the ARIC study. J.Clin. Epidemiol. 2003,56:880-90; Najjar S.S et.al- Arterial aging: is it an inmutable cardiovascular risk factor? Hypertension, 2005;46:454-62).

CHOLINERGIC STIMULATION IN SKIN CANCER



CORINA DANIELA ENE (NICOLAE)[1], MIRCEA TAMPA[1,2], SIMONA ROXANA GEORGESCU[1,2], IRINA TUDOSE[1], MARIA GRIGORE[1], CLARA MATEI[1], VASILE BENEA[1], ILINCA NICOLAE[2]

[1]Dermatology Department.„Carol Davila"University of Medicine and Pharmacy, Bucharest
[2]„Victor Babes"Clinical Hospital, Bucharest

ABSTRACT

Hypothalamic-pituitary-adrenal-axis (HPAA) activation contributes to development of several types of cancer. It has been postulated that cholinergic system coulf play an important role in skin cancer pathophysiology. In the present paper, the authors focus on the assessment of cholinergic imbalances in cutaneous tumors. Acetylcholinesterase (AChE) activity was evaluated as well as the level of acetylcholine in extraneural malignant tissues, in their benign counterparts and in nonlesional tissues. As a result, in malignant melanoma a 1.8 times decrease in acetylcholinesterase activity was observed, as compared to dysplastic nevi; in squamous cell carcinoma the authors observed a reduction of 1.6 times as compared to keratoacanthoma, accompanied by 1.9 times decrease as compared to nonlesional skin; in basal cell carcinoma, 1.3 times, 1.2 times, 1.2 times and 1.3 times reductions were encountered as compared to hydradenoma, eccrine poroma, infundibulum tumor and non lesional skin respectively. Moreover, a significant reduction in tissular acetylcholinesterase activity was observed depending on the evolutive stage of the disease.

The present results represent solid proves supporting the essential role played by the underxpression of acetylcholinesterase in tumoral proliferation stimulation, as well as in the progression and invasion of skin cancer. Tissue acetylcholinesterase could be employed as a differentiation marker between malignant and bening cutaneous tumors.

Key words: *skin cancer, tissular acetylcholinesterase, tumorigenesis, carcinogenesis*

Correspondence to:

Dr. Ilinca Nicolae
Address: „Victor Babes"Clinical Hospital, Sos. Mihai Bravu, nr 281, Bucharest, Romania
Phone: +4 021 3172721
E-mail address: drnicolaei@yahoo.ro

INTRODUCTION

An entire combination of elements, including psychological stress, hormonal status, immune system and neurotransmitters seem to interfere with the skin-brain-immune system axis in assuring the cutaneous homeostasis. It is generally accepted by most authors in the field that neurotransmitters unbalance represents an important part of the skin cancer associated pathology (1,2). The neurotransmitters (also widely aknlowledged as „chemical mediators") are chemical compounds synthesised by the nervous system; once released in the synaptic cleft in response to a stimulus, they accomplish the transmision, modulation and augmentation of the nervous response. Besides the neurotransmitters *per se*, the transmision of the nervous impulse also necessitates the contribution of cotransmitters and neuromodulators. There have been identified more than 100 chemical compounds produced by the nervous system able to act as neurotransmitters/signaling molecules. (1,2). The main brain neurotransmitters may be grouped as follows:

- aminoacids (glutamate, GABA);
- peptids (somatostatin, vasopressin);
- biogenic amines (adrenaline, noradrenaline, dopamine);
- acetylcholine.

The cotransmitters are released in the same time as the chemical mediators and are involved in the modulation of postsynaptic response and in the regulation of the amount of released neurotransmitters. The neuromodulators do not act in a direct manner in producing postsynaptic response, but produce prolonged changes in the sensibility of the postsynaptic membrane. The existence of the neurotransmitters in extraneuronal tissues has been confirmed for a long time by:

- identifying the neurotransmitter in its active form or in a precursor form at the level of non-neuronal tissues;
- the presence of enzymatic sustems involved in the biosynthesis of neuromediators;
- the existence of the enzymes able to inactivate the neurotransmitter;
- the presence of the adequate receptors that accomplish the extraneuronal ligang coupling;
- signal transduction by opening/closing the ionic channels or signal transmission to second messengers or G proteins in extraneuronal tissues;
- specific effects at the level of the extraneuronal tissue accomplished by employment of agonists (adrenergic/cholinergic) or antagonists (adrenolytic/anticholinergic) either stimulating or blocking the activity of the neurotransmitter.

Newly available scientific data have shown the central role of the cholinergic systems in cutaneous homeostasis and skin pathology. Recent research employing more laborious techniques have not only found answers to several questions, but in the same time raised new challenges. The level of acetylcholine can be assessed directly or indirectly through evaluation of these parameters in either blood, urine, cerebrospinal fluid, normal and pathological tissues. Identifying cholinergic imbalance in skin cancer proves to open the gates to a whole new universe inviting to further exploration. Skin cancer remains an enigma only partially solved due to, probably, the neuroectodermal origin of melanocytes and their preferential situation bewteen the epidermal keratinocytes (ectodermal origin). For the time being,

the most challenging properties of the neurotransmitters exhibited in extraneuronal tissues are represented by their involvement in tumorigenesis, metastasis, carcinogenesis, inflammation, immunomodulation, signaling, angiogenesis and apoptosis (3-5).

The objective of the present study consists in the assessment of the cholinergic imbalance in skin tumors through determining the activity of acetylcholinesterase – the enzyme responsible of acetylcholine inactivation in skin.

MATERIAL AND METHOD

In order to assess the **acetylcholinesterase** we have used tumoral fragments and peritumoral tissue for the extraction of proteins employing TRIS buffer (pH 7.4). The proteins were assessed using Lowry method and the acetylcholinesterase activity was evaluated using DTNB (5:5 dithiobis-dinitro-benzoate) based on the following chemical reactions:

$$H_2O + (CH_3)_3\overset{+}{N}CH_2CH_2SCOCH_3 \xrightarrow{\text{(enzyme)}} (CH_3)_3\overset{+}{N}CH_2CH_2S^{-} + CH_3COO^{-} + 2H^{+}$$

$$(CH_3)_3\overset{+}{N}CH_2CH_2S^{-} + \underset{\text{(I)}}{RSSR} \longrightarrow (CH_3)_3\overset{+}{N}CH_2CH_2SSR + \underset{\text{(II)}}{RS^{-}}$$

The patients were included in the study after signing an informed consent accordingly to WMA Declaration of Helsinki in 1964, with previous approval of the Ethics Board of the hospital. The biological samples were obtained following surgical excision of tumors. The diagnosis was established following clinical and histopathological examinations. Total proteins and acetylcholinesterase were assessed in:

- malignant melanoma (figure 1) vs dysplastic nevi (figura 2);
- squamous cell carcinoma (figure 3) vs keratoacanthoma (figure 4);
- basal cell carcinoma (figure 5) vs hydradenoma (figure 6), eccrine proroma (figure 7), infundibulum tumor (figure 8).

RESULTS

1. Acetylcholinesterase activity in tumoral and non-tumoral tissue

Enzymatic activity of AChE was measured in cutaneous malignant tumoral tissues (malignant melanoma, squamous cell carcinoma, basal cell carcinoma), benign tumors (dysplastic nevi, keratoacanthoma, nodular hydradenoma, eccrine poroma, infundibulum tumor), as well as in nonlesional cutaneous tissue. The enzymatic activity was expressed in mU/mg protein and is figured in the following table (table 1):

Table 1. AChE (mU/mg protein) in tumoral tissue

Analysed tissue	AChE (mU/mg protein)
Dysplastic nevi	10,4±1,4
Malignant melanoma	5,9±2.2
Squamous cell carcinoma	2,1±0,9
Keratoacanthoma	3,4±1,2
Basal cell carcinoma	2,9±1,8

Analysed tissue	AChE (mU/mg protein)
Nodular hydradenoma	3,6±1,4
Eccrine poroma	3,5±0,7
Infundibular tumor	3,7±1,2
Non-lesional tissue	3,9±2,1

The presence of acetylcholinesterase in nonexcitable tissues supports its involvement in other phisiopathological processes, apart from its catalytic activity. The reduction of AChE activity in melanoma vs dysplastic nevi (5,01±1,9 vs 10,4±1,4 mU/mg protein, $p<0,05$) associated with an increase of acetylcholine in neoplastic tissues. Similar results were obtained in squamous cell carcinoma versus keratoacanthoma (2,1±0,9 vs 3,4±1,2 mU/mg protein, $p<0,05$). No statistically significant differences were encountered between AChE level in basal cell carcinoma and the benign structures analysed (nodular hydradenoma vs basal cell carcinoma: 3,6±1,4 vs 2,9±1,8 mU/mg protein, $p>0,05$; eccrine poroma vs basal cell carcinoma: 3,5±0,7 vs 2,9±1,8 mU/mg protein, $p>0,05$, infundibulum tumor vs basal cell carcinoma: 3,7±1,2 vs 2,9±1,8 mU/mg protein, $p>0,05$). In respect for the different embryologic origin of the melanocytes and the keratinocytes, no comparison of acetylcholinesterase activity between melanoctic and keratinocytic lesions was performed.

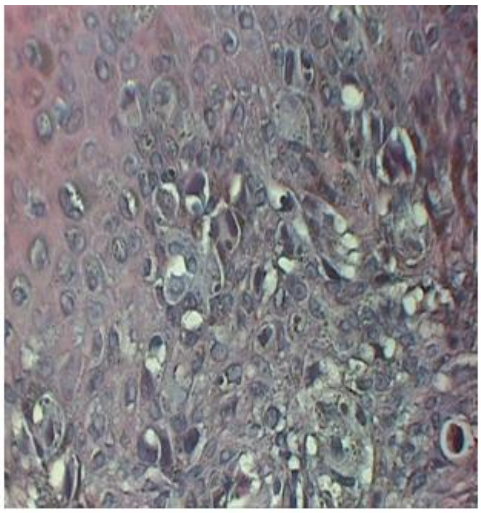


Figure 1. Melanoma. 40x. HE staining

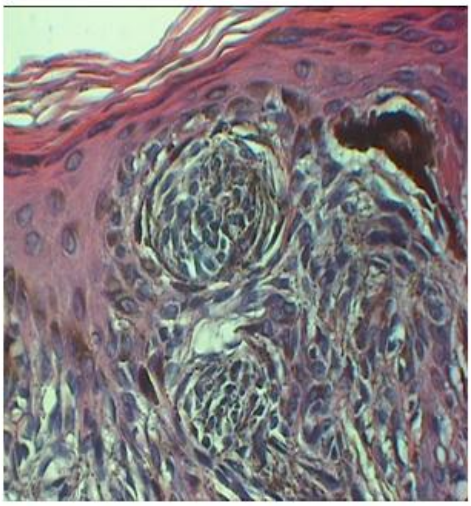


Figure 2. Dysplastic nevi. 40x. HE staining

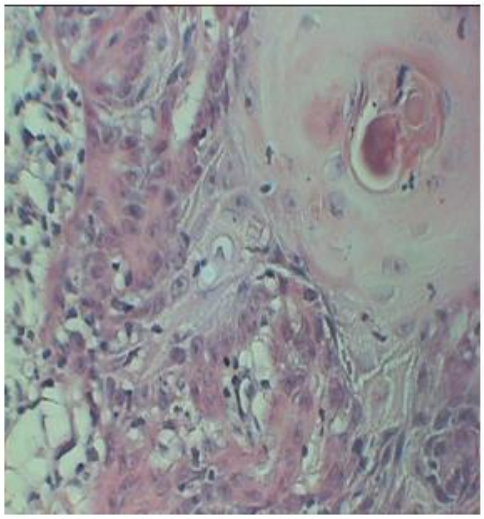


Figure 3. Squamous cell carcinoma. 40x. HE staining

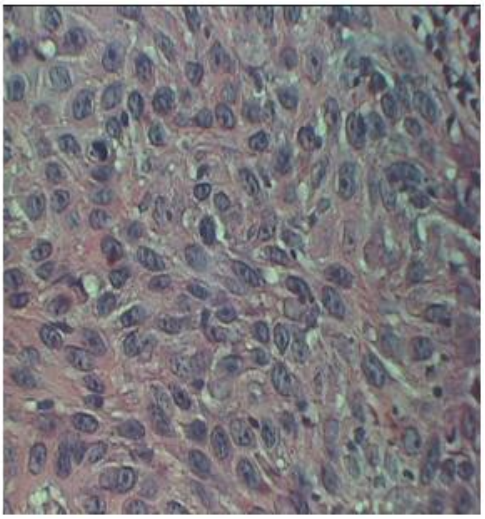


Figure 4. Keratoacanthoma. 40x. HE staining

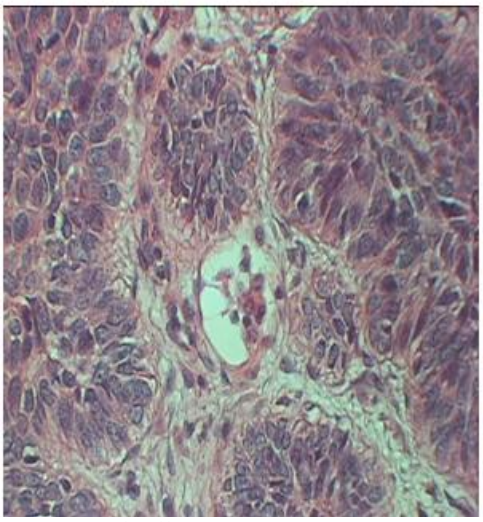


Figure 5. Basal cell carcinoma. 40x. HE staining

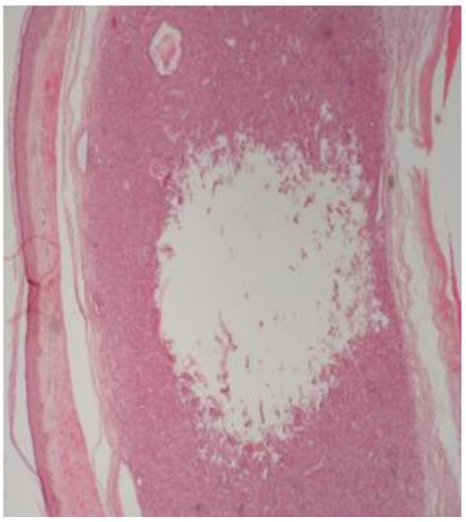


Figure 6. Hydradenoma. 40x. HE staining

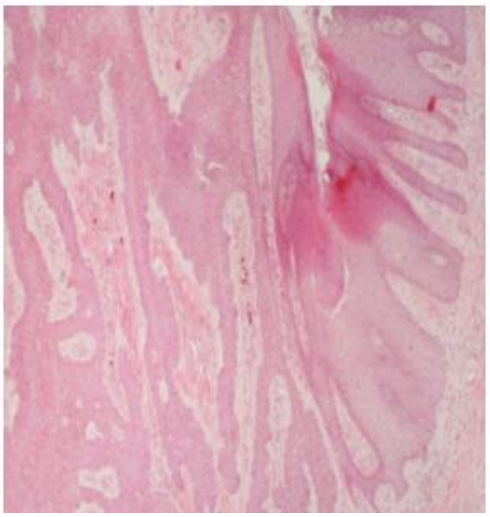


Figure 7. Eccrine poroma. 40x. HE staining

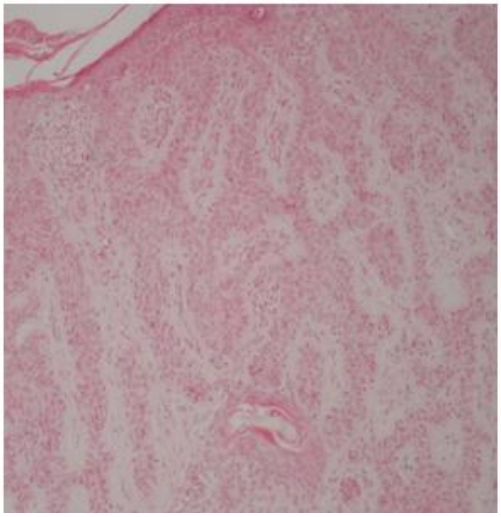


Figure 8. Infundibulum tumor. 40x. HE staining

2. Cholinesterasic activity variation in respect to histologic particularities of melanoma

Tissular AChE level was analysed in respect to both the surface extension and depth of melanomas. A decrease in AChE activity was observed, that parallels the increase in Clark level. As compared to Clark II, the following variations were obtained for Clark III (4,58±2,03mU/mg protein vs 3,85±2,06 mU/mg protein, p=0,32), Clark IV (4,58±2,03mU/mg protein vs 3,05±1,86 mU/mg protein, p=0,03), respectiv Clark V (4,58±2,03mU/mg protein vs 2,69±1,74 mU/mg protein, p=0,007). The same variation was observed for Breslow index, but the statistical significance was encountered for Breslow>3.01 mm as compared to Breslow<1.0 mm (4,65±2,10 mU/mg protein vs 2,83±1,74 mU/mg protein, p=0,03).

Figure 9 shows the variation in tissular AChE activity in respect to tumor histological type and Breslow activity, for the same Clark invasion level (figure 9):

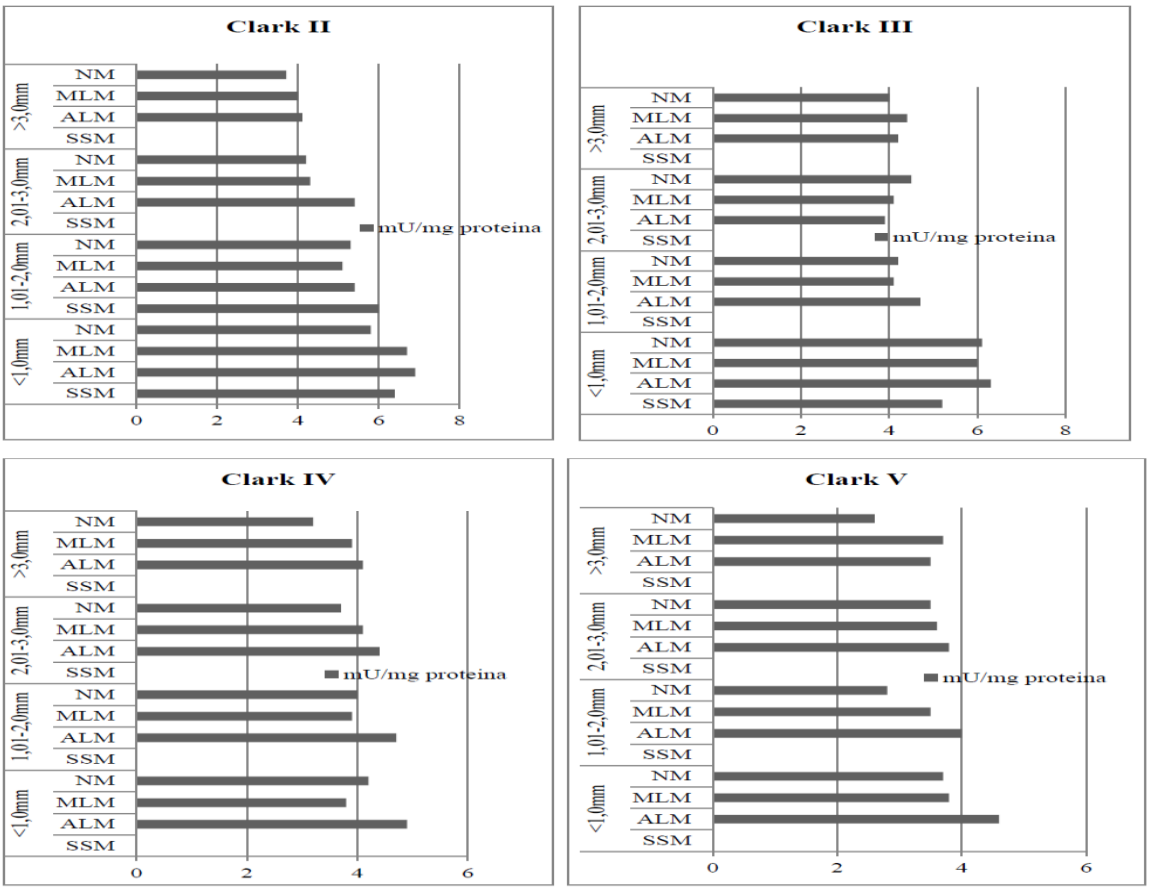


Figure 9. The variation in tissular AChE activity in respect to tumor histological type and Breslow activity, at the same Clark invasion level

DISCUSSIONS

Assessing the cholinesterasic activity represents a reliable test of evaluation of acetylcholine level in a biological system. The increase in cholinesterease activity is associated with the reduction of the level of acetylcholine and the prevention of its biological activity (6). Interesting to mention, the cholinesterase deficit may be partially compensated by paraoxonase and albumin esterase activity (7).

The presence of acetylcholinesterase in nonexcitable tissues supports its involvement in other phisiopathological processes, besides its catalytic activity. Based on the forementioned results, the authors assess that acetylcholinesterase activity is substantially reduced in malignant tumors, as opposed to their benign cellular counterparts. Therefore, in malignant melanoma we have observed a decrease in acetylcholinesterase activity of 46% compared to dysplastic nevi. The activity of the enyme is decreased with 39% in squamous cell carcinoma as compared to keratocanthoma. Similar relationships have been encountered in basal cell carinoma – a decrease of 20% as compared to hydradenoma, 18% as compared to eccrine proroma and 22% compared to infundibular tumors. Compared to nonlesional cutaneous tissue, acetylcholinesterase activity in basal cell carcinoma represents 74% of the activity observed in normal tissues, whilst in squamous cell carcinoma the activity of the enzyme represents 53% of the activity assessed for normal nonlesional tissue.

Cholinesterasic activity is also influenced by the tumor agressiveness.

In malignant melanoma we could observe variations in the activity of acetylcholinesterase, dependent upon the histopathological parameters (figure 9). These results support the idea according to which the decrease in cholinesterasic activity in skin tumors and the consecutive increase of acetylcholine could lead to cholinergic overstimulation and the augmentation of cell proliferation. Similar results have been obtained in leukemia (8), ovarian carcinomas (9), numerous tumoral cell lines (10), brain tumors (12), breast carcinoma (13-15), astrocytomas, colorectal cancer, meningiomas (16). According to these studies, the underexpression of acetylcholinesterase activity in malignant tissues associated with increased levels of acetylcholine induce the stimulation of cell proliferation, of cell migration and invasion and counteract apoptosis. In malignant tumors, acetylcholine activates STAT3 and AKT transduction pathways and interacts with the corresponding receptors.

Acetylcholine could play a role of paramount importance in the pathophisiology of skin cancer through modulation of inflammatory reactions, the depreciation of the immune response, the decrease in the numer of cytotoxic T cells and NK cells, the alteration of redox balance, the deficiencies in DNA reparation mechanisms, genomic instability, the accumulation of spontaneous mutations and the inhibition of apoptosis (3.4).

CONCLUSIONS

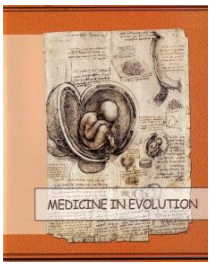
In summation, the presented results offer new perspectives over the molecular mechanisms of cutaneous carcinogenesis, consisting in the reduction of the activity of the enzymes involved in acetylcholine inactivation. Acetylcholinesterase could be employed as a marker for differentiating between benign and malignant skin tissues.

REFERENCES

1. Ghanemi A, Tumors, Neurotransmitters and Pharmacology: Interactions and Implications, International Journal of Public Health Science 2013, 2(1), 17-22;
2. Sperner-Unterweger B, Kohl C, Fuchs D, Immune changes and neurotransmitters: Possible interactions in depression?, Progress in Neuro-Psychopharmacology and Biological Psychiatry, Prog Neuropsychopharmacol Biol Psychiatry. 2012 Oct 17. pii: S0278-5846(12)00260-6. doi: 10.1016/j.pnpbp.2012.10.006
3. Slominski A, Zbytek B, Zmijewski M, Slominski RM, Kauser S, Wortsman J, Tobin DJ. Corticotropin releasing hormone and the skin, Front Biosci, 2006,11,2230-48.
4. Slominski A,Zmijewski M, Skobowiat C, Zbytek B, Slominski R, Steketee J:Sensing the Environment: Regulation of local and global homeostasis by the skin neuroendocrine system,Adv. Anat. Embryol. Cell Biol 2012,212.1-115
5. Grando SA, Kist DA, Qi M, Dahl MV. Human keratinocytes synthesize, secrete, and degrade acetylcholine J Invest Dermatol. 1993 Jul;101(1):32-6.
6. Pavlov VA, Wang H, Czura CJ, Friedman SG, Tracey KJ. The cholinergic anti-inflammatory pathway: a missing link in neuroimmunomodulation. Mol Med. 2003 May-Aug;9(5-8):125-34.
7. Marsillach J, Camps J, Ferré N, Beltran R, Rull A, Mackness B, Mackness M, Joven J.Paraoxonase-1 is related to inflammation, fibrosis and PPAR delta in experimental liver disease. BMC Gastroenterol. 2009 Jan 14;9:3. doi: 10.1186/1471-230X-9-3.
8. Lapidot-Lifson,Y., Prody,C.A., Ginzberg,D., Meytes,D., Zakut,H., Soreq,H Coamplification of human

acetylcholinesterase and butyrylcholinesterase genes in blood cells: correlation with various leukemias and abnormal megakaryocytopoiesis. Proc. Natl Acad. Sci. USA, 86, 4715–4719.
9. Zakut,H., Ehrlich,G., Ayalon,A., Prody,C.A., Malinger,G., Seidman,S., Ginzberg,D., Kehlenbach,R. and Soreq,H. Acetylcholinesterase and butyrylcholinesterase genes coamplify in primary ovarian carcinomas. J. Clin. Invest, 1990, 86, 900–908.
10. Karpel,R., Aziz-Aloya,R., Sternfeld,M., Ehrlich,G., Ginzberg,D., Tarroni,P., Clementi,F., Zakut,H. and Soreq,H. (1994) Expression of three alternative acetylcholinesterase messenger RNAs in human tumor cell lines of different tissue origins. Exp.Cell Res., 210, 268–277
11. Greenfield,S. Non-classical actions of cholinesterases: role in cellular differentiation, tumorigenesis and Alzheimer's disease. Neurochem. Int., 28, 485–490
12. Perry,C., Sklan,E.H., Birikh,K., Shapira,M., Trejo,L., Eldor,A. and Soreq,H. (2002) Complex regulation of acetylcholinesterase gene expression in human brain tumors. Oncogene, 21, 8428 8441.
13. Zakut,H., Even,L., Birkenfeld,S., Malinger,G., Zisling,R. and Soreq,H. (1988) Modified properties of serum cholinesterases in primary carcinomas. Cancer, 61, 727-737.
14. Ruiz-Espejo,F., Cabezas-Herrera,J., Illana,J., Campoy,F.J., Munoz-Delgado,E. and Vidal,C.J. (2003) Breast cancer metastasis alters acetylcholinesterase activity and the composition of enzyme forms in axillary lymph nodes. Breast Cancer Res. Treat., 80, 105–114.
15. Ruiz-Espejo,F., Cabezas-Herrera,J., Illana,J., Campoy,F.J. and Vidal,C.J. Cholinesterase activity and acetylcholinesterase glycosylation are altered in human breast cancer. Breast Cancer Res. Treat., 2002, 72, 11–22.
16. Nguyen HB, Lee SY, Park SH, Lee MY, Chang IH, Myung SC. Relaxing effect of acetylcholine on phenylephrine-induced contraction of isolated rabbit prostate strips is mediated by neuronal nitric oxide synthase. Korean J Urol. 2013 May;54(5):333-8. doi: 10.4111/kju.2013.54.5.333.

THE MANAGEMENT OF SEXUAL DYSFUNCTION IN PATIENTS WITH LICHEN SCLEROSUS



MIRCEA TAMPA[1], ISABELA SARBU[2], CLARA MATEI[1], CRISTIAN OANCEA[3], VASILE BENEA[2], SIMONA-ROXANA GEORGESCU[1]

[1]"Dermatology Department, Carol Davila"University of Medicine and Pharmacy, Bucharest
[2]Dermatology Department, "Victor Babes"Hospital for Infectious and Tropical Diseases, Bucharest
[3]Pneumology Department, "Victor Babes"University of Medicine and Pharmacy, Timisoara

ABSTRACT

Lichen sclerosus (lichen sclerosus et atrophicus) is a chronic, inflammatory, debilitating, progressive disorder of unknown origins, often underdiagnosed, especially affecting the genital mucosa, in which there occur areas of atrophy accompanied by underlying bands of hyalinisation. Lichen sclerosus (LS) can be associated with intense pruritus and can evolve towards the development of urethral strictures and/or malignant transformation into squamous cell carcinoma; the treatment of this affliction is concentrated on decelerating the evolution of the disorder, as well as on the prevention of functional complications and malignant degeneration. However, in its evolution LS creates both an aesthetic discomfort and functional disturbance in the genital area (dyspareunia, apareunia, phimosis, paraphimosis), all of the above negatively affecting the normal sexual functioning of the patient and his quality of life. Most often, in everyday practice, the management of the sexual disturbance of these patients is considered subsidiary. The present paper aims to emphasize the management of sexual dysfunction in those patients.

Key words: *Lichen sclerosus, sexual dysfunction*

Correspondence to:

Mircea Tampa
MD, PhD, Assistant Lecturer
Address: Sos. Mihai Bravu 281, 3rd District, Bucharest, Romania a
Phone: +4 0726382600
E-mail address: tampa_mircea@yahoo.com

INTRODUCTION

Lichen sclerosus (LS) is a chronic inflammatory disorder especially affecting the genital mucosa in both genders, where it produces whitish atrophic plaques and progressive sclerosis. First described by Hallopeau and Darier as a variant of lichen planus (1), the condition received numerous appellatives over time, the most common being *balanitis xerotica obliterans* (in males) and *kraurosis vulvae* (in females). The frequency of LS in the general population is difficult to estimate, the disorder being frequently underdiagnosed; an incidence of 14 cases to 100.000 people is considered to be reasonable (2). Females are more frequently affected as compared to men, at a sex ratio M/F of 1:5 (3).

Etiopathogeny. The etiology of LS is unknown, but the repeated action of local irritating factors, the autoimmunity (67% of the cases of LS presenting autoantibodies against type XII collagen and extracellular matrix protein 1 ECM-1 involved in the assembling of dermal collagen fibers), the oxidative stress (objectified by the advanced perturbation of the proteins structure, DNA and lipid peroxidation in LS lesions) and fibroblast dysfunction (fibroblasts seem to produce a higher quantity of collagen fibers than normally) are suspected (2,4).

Clinical manifestations. LS affects both the genital and/or anal mucosa and the skin, causing epidermal atrophy and edematous hyalinisation bands of the underlying connective tissue.

In extragenital disorders, LS manifests through the appearance on the trunk, neck or thighs of porcelain-white plaques which can confluate forming plaques of variable dimensions, presenting keratotic plugs on the surface, lesions most often not accompanied by any subjective complaints, except for the aesthetic discomfort *(Figure 1)*. Extragenital LS can accompany genital LS (15% of the patients diagnosed with genital LS associate extragenital LS) or it can occur isolated, rarely, only 2.5% of the cases of LS presenting solely the extragenital form, without any anogenital impairment (5).

Figure 1. Extragenital lichen sclerosus whitish papules

Anogenital LS manifests through the occurrence of white, porcelain-like, atrophic, sclerous papules, which can confluate forming plaques whose dimensions can vary from a few millimeters to forming an entire ring-like (annular) stricture. Following the alteration of the cutaneous-mucous texture, telangiectasias, erythema, erosions and fissures can occur on the surface of the lesions. Regarding the subjective manifestations, anogenital LS is associated with pruritus of variable intensity, and, in case of erosions and fissures co-occurence, with sensitivity and pain that can lead

to dyspareunia and apareunia (6). The anal involvment determines painful defecation and bleeding in both genders. The genital affection can produce fissures and bleeding in both genders. In females, the association of both anal and genital disorder can determine the clinical aspect resembling "figure 8"or an hourglass, a sclerous ring surrounding the anal orifice and the vulva *(Figure 2)*. The genital disorder in females can lead to the narrowing of the vaginal introitus and labial synechiae. In males, the lesions usually occur on the prepuce and glans and rarely on the shaft or on the skin of the scrotum. In males there can occur phimosis (defined as the incapacity of retracting the foreskin of the glans)(*Figure 3*), paraphimosis (the incapacity of pulling back of the prepuce over the glans), longitudinal fissures of the sclerous atrophic preputial ring and even the stricture of the urinary meatus, severe enough to determine dysuria (2).

Figure 2. Anogenital lichen sclerosus (LS) in a female patient

Figure 3. Lichen sclerosus (LS) affecting male genitals; characteristic whitish stricture ring formation impeding prepuce retraction

The diagnosis of the disorder is usually established by the dermatologist, based on the clinical aspect, and the confirmation can be achieved through histopathologic examination (*Figure 4*) which shows epidermal atrophy, the underlying collagen bands, dilated blood vessels and the presence of a lichenoid inflammatory infiltrate in the dermis (2).

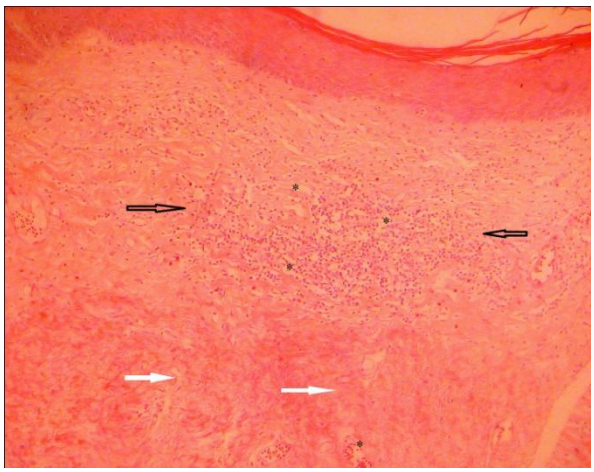


Figure 4. HE examination in lichen sclerosus revealing epidermal atrophy, thick collagen bands (white arrows), dilated blood vessels (*), lichenoid inflammatory infiltrate in the dermis (arrow)

The disorder must be differentiated from Zoon plasma cell balanitis, lichen planus, lichen simplex chronicus, vitiligo, cicatricial pemphigoid and leucoplasia. A particularly important aspect is the differentiation between LS occurring in early childhood and the signs of sexual abuse, since the extension of LS can be accelerated in children who are predisposed to mechanic trauma, as a result of the Koebner phenomenon (Koebner isomorphic reaction) (3); therefore, LS and sexual abuse are not mutually exclusive events (7).

Complications. Anogenital LS has a progressive evolution, marked by numerous complications.

Some of those are (2,8,9):

— appearrance of fissures, erosions and bleeding
— stenosis of the urinary meatus (*Figure 5*)
— narrowing of the vaginal introitus
— labial synechiae
— clitoridian alterations
— phimosis
— paraphimosis
— dyspareunia
— apareunia
— lichenification secondary to intense local pruritus
— malignant transformation into squamous cell carcinoma (*Figure 6*)

Figure 5. Meatal strcicture complicating LS

Figure 6. Squamous cell carcinoma of the penis on LS affected mucosal area; numerous erosions areas also present on glans penis and prepuce

THERAPEUTIC MANAGEMENT OF LICHEN SCLEROSUS

Medical therapy

Potent topical corticosteroids - clobetasol is usually used, inducing remission of the disorder. Schwegler et al. showed in a study published in 2011 that topically applied clobetasol improves the quality of life in patients with vulvar LS (10). Other studies also certify the therapeutic role of potent corticosteroids in patients with vulvar LS (11,12). The standard treatment consists in 4 weeks of daily topical applications of clobetasol; it is recommended to avoid longer treatments to elude iatrogenic atrophy, secondary to the use of potent corticosteroids, which could worsen the atrophy determined by LS (2).

Topically applied testosterone - previously used empirically, topical testosterone treatment was abandoned as a result of its inefficacy and its inferiority as compared to clobetasol therapy (13). Moreover, topical

treatment with testosterone in women with vulvar LS determines virilisation, accompanied by increased levels of plasmatic testosterone (14). Even though the level of dehydrotestosterone is reduced in untreated patients with vulvar LS, proof of a 5α-reductase deficiency, in LS lesions there are no testosterone receptors, therefore the treatment had to actual physiopathological basis, but empirical usage and now is only of historical interest (12).

Systemic corticotherapy - is efficient especially in extragenital lesions and, to a lower extent, in anogenital lesions (2).

Calcineurin inhibitors - tacrolimus, pimecrolimus. A study published by Kyriakou in May 2013 showed that treatment with clobetasol propionate 0.05% is efficient as a first line treatment in patients with LS, while there is no significant difference between patients receiving, after the remission obtained with clobetasol treatment, a maintenance treatment with tacrolimus 0.1%, respectively with methylprednisolone aceponate 0.1% (15). Calcineurin inhibitors have the advantage of lacking adverse reactions such as genital candidiasis and atrophy secondary to the treatment. However, calcineurin inhibitors are useful in the management of the cases that are refractory to the potent dermatocorticoid treatment (16).

Topical applications of vitamin E and/or emollients - useful in patients in the remission phase after topical applications of potent corticosteroids. Virgili et al. showed that there is no significant difference in the recurrence rate between patients who followed vitamin E maintenance therapy and those who applied topical emollients (17).

The use of special lingerie (Dermasilk™) is an adjuvant to clobetasol treatment and vitamin E ointment, D'Antuono et al. showing a decrease of the pruritus, burning sensation and erythema in patients who wore this type of lingerie, as compared to patients who wore usual cotton lingerie (18).

Surgical care in patients with LS

The surgical treatment can employ dilation of the urinary meatus and the navicular fossa, surgical treatment of the phimosis or, in some cases, paraphimosis, circumcision, detachment of the labial synechiae, vulvectomy/perineotomy (2,9). Circumcision in patients with LS determines the disappearance of LS, with a success rate varying between 76-100% (12), probably as a consequence of adjustments in the local microenvironment. The risk of malignant transformation to squamous cell carcinoma is 4.9% (12). Patient must be followed-up periodically to detect the occurrence of complications (appearance of urethral strictures, development of a squamous cell carcinoma, etc), in which case surgical intervention is recommended.

Sexual function improvement methods in patients with LS

LS is a chronic, debilitating, progressive disorder which can be accompanied by complications that leave a mark on sexual function (19). LS creates both aesthetic discomfort and functional disturbances in the anogenital area, all of those acting in a negative manner on the normal sexual functioning of the patient and on his/her quality of life. In females, LS determines dyspareunia, apareunia, a decrease in the frequency of sex acts and delayed orgasms (20). In males, genital fissures and erosions can cause pain during the sexual intercourse and the presence of a complete preputial ring of stricture can determine the appearance of paraphimosis during the intromission.

To diminish the negative effects of LS on the sexual function, patients can be recommended:

— the use of lubricants. Genital mucosa atrophy, erosions and fissures produce sensitivity and pain which can be accentuated by

the movement and local shearing forces during sexual intercourse. In these circumstances, the use of lubricants decreases the unpleasant sensations, having a benefic role on the sex act in itself and an important psychological role by preventing the induction of psychological suppression during sexual intercourse, as a result of pain.

— local anesthetics applications. Alongside other presentation forms (sprays, gels, anesthetic creams - lidocaine, benzocaine), local anesthetic condoms can be recommended, assuring the increase in the pain threshold and improving the sex act. Benzocaine has a well-known allergising potential, cases of contact dermatitis being described after the use of condoms containing benzocaine (21,22). Therefore, these condoms can only be recommended to patients who do not have any known hypersensibility to anesthetics. Moreover, local anesthetics are useful in patients with premature ejaculation, a decrease in the local sensitivity leading to prolongation of the sex act by delaying ejaculation. Also, Ventolini et al. showed that local injections of a combination between corticosteroids and a local anesthetic in patients with moderate LS determines a considerable reduction of the pruritus, as compared to patients with LS who were treated with topical applications of a high potency corticosteroid; however, the same study showed a lower satisfaction degree in the patients treated with the injecting method (23).

As regards to the patient dialog, this should be focused on:

— explaining the chronic and progressive nature of the disease, but also the complications that can arise.

— explaining the therapeutic solutions, including circumcision, which is sometimes psychologically difficult to accept

— counselling regarding the use of condom during sexual intercourse is extremely important in patients with LS, since fissures and bleeding caused by both the disorder itself and the pruritus can represent important routes of infection for microorganisms during sexual intercourse, predisposing these patients to sexually transmitted infections (hepatitis B, hepatitis C, HIV infection, gonorrhoea, etc). In these circumstances, the use of condoms containing local anesthetic in patients with local sensitivity can improve the sex performance by diminishing local disconfort as well as preventing sexual transmitted diseases infection. Also, a good local hygiene is recommended in these patients, to prevent the development of local infections which can be favored by the presence of erosions, fissures and bleeding.

— counselling the patient with phimosis, to inform him about the risk of paraphimosis occurrence during sexual intercourse and the need to address a urology department to perform a circumcision if paraphimosis occurs during the act.

— directing the patient to support communities for people suffering from LS, including online support groups (24).

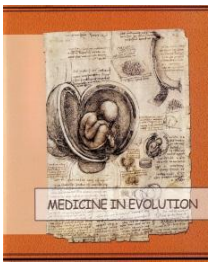
CONCLUSIONS

Lichen sclerosus is a chronic, progressive disorder, marked by numerous aesthetic and functional complications that can negatively mark the sexual functioning of the affected individuals. The management of the sexual dysfunction in persons suffering from LS mainly addresses the decrease of the discomfort occurring during sexual intercourse by using lubricants and local anesthetics and represents an important part of the treatment plan of these patients, often demanding the interdisciplinary collaboration between the dermatologist, gynecologist and urologist.

REFERENCES

1. Neill SM, Tatnall FM, Cox NH; Guidelines for the management of lichen sclerosus. British Association of Dermatologists., Br J Dermatol. 2002 Oct;147(4):640-9.
2. Hengge UR, Lichen sclerosus, in Fitzpatrick's Dermatology in General Medicine, 7th Ed., McGrawHill, 2008, pp: 546-50, ISBN 978007149442-7
3. Powell JJ, Wojnarowska F. Lichen sclerosus, Lancet. 1999 May 22;353(9166):1777-83.
4. Sander CS, Ali I, Dean D, Thiele JJ, Wojnarowska F. Oxidative stress is implicated in the pathogenesis of lichen sclerosus. Br J Dermatol. 2004 Sep;151(3):627-35.
5. Dalziel KL. Effect of lichen sclerosus on sexual function and parturition. J Reprod Med. 1995 May;40(5):351-4.
6. Powell J, Wojnarowska F. Childhood vulval lichen sclerosus and sexual abuse are not mutually exclusive diagnoses. BMJ. 2000 Jan 29;320(7230):311.
7. Bolognia, JL et al., Dermatology e-dition: Text with Continually Updated Online Reference, 2nd edition, Mosby, 2008, ISBN: 978-1416032694
8. Schwegler J, Schwarz J, Eulenburg C, Blome C, Ihnen M, Mahner S, Jaenicke F, Augustin M, Woelber L.Health-related quality of life and patient-defined benefit of clobetasol 0.05% in women with chronic lichen sclerosus of the vulva. Dermatology. 2011;223(2):152-60.
9. Fistarol SK, Itin PH. Diagnosis and treatment of lichen sclerosus: an update. Am J Clin Dermatol. 2013 Feb;14(1):27-47. doi: 10.1007/s40257-012-0006-4.
10. Parker LU, Bergfeld WF. Virilization secondary to topical testosterone. Cleve Clin J Med. 1991;58:43–46.
11. Maassen MS, van Doorn HC. Topical treatment of vulvar lichen sclerosus with calcineurin inhibitors Ned Tijdschr Geneeskd. 2012;156(36):A3908.
12. D'Antuono A, Bellavista S, Negosanti F, Zauli S, Baldi E, Patrizi A. Dermasilk briefs in vulvar lichen sclerosus: an adjuvant tool, J Low Genit Tract Dis. 2011 Oct;15(4):287-91. doi: 10.1097/LGT.0b013e31821380a0.
13. Pinelli S, D'Erme AM, Lotti T. Management of sexual dysfunction due to vulvar lichen sclerosus in postmenopausal women. Dermatol Ther. 2013 Jan-Feb;26(1):79-82.
14. Burrows LJ, Creasey A, Goldstein AT, The treatment of vulvar lichen sclerosus and female sexual dysfunction. J Sex Med. 2011 Jan;8(1):219-22. doi: 10.1111/j.1743-6109.2010.02077.x
15. Foti C, Bonamonte D, Antelmi A, Conserva A, Angelini G. Allergic contact dermatitis to condoms: description of a clinical case and analytical review of current literature. Immunopharmacol Immunotoxicol. 2004 Aug;26(3):481-5.
16. Ventolini G, Swenson KM, Galloway ML. Lichen sclerosus: a 5-year follow-up after topical, subdermal, or combined therapy. J Low Genit Tract Dis. 2012 Jul;16(3):271-4. doi: 10.1097/LGT.0b013e31823da7e8.
17. http://lichensclerosus.org/, consulted 3 noiembrie 2013

INCORPORATING COMPOSITE MESHES – CASE STUDY



TEODOR DAN POTECA[1], DANIELA ELENA MIHAILA[1], ANCA GABRIELA POTECA[2], CLARA MATEI[3], SILVIU PITURU[3], MARIA COMANESCU[2], CRISTIAN OANCEA[4], MIRCEA TAMPA[3]

[1]General Surgery Unit, Colentina Clinical Hospital, Bucharest;
[2]Pathology Department „Carol Davila"University of Medicine and Pharmacy, Bucharest,
[3]„Carol Davila"University of Medicine and Pharmacy, Bucharest;
[4]Infectious diseases Department „Victor Babes"University of Medicine and Pharmacy, Timisoara

ABSTRACT

Although surgery aimed at repairing a parietal defect is among the most frequently performed operations in a department of general surgery, the complexity of the procedure and the perioperative risk ofen poses important challenges.The technique chosen has an essential role in the evolution of the patient, but the most important element is the type of material that make up the mesh used for prosthetics and the particular manner in which the patient reacts to the them. In time, many types of materials were imagined for use in abdominal wall alloplasty, adapted to the techniques implemented. The latest growing trend is the use of laparoscopic technique and intraperitoneal placement of double layer composite meshes.This paper presents the case of a patient who suffered, in the course of a year and a half, two laparoscopic surgical interventions aimed to cure a left Spiegel hernia and subsequently a homolateral inguinal one. The second intervention gave us the opportunity to observe the evolution of integrating dual layer meshes.

Key words: *laparoscopic cure of wall deffects, composite mesh, mesh integration*

Correspondence to:

Dr. Daniela Elena Mihaila
Address: „ Colentina Clinical Hospital, Stefan cel Mare no. 19-21, 020125 Bucharest
E-mail address: mediv@yahoo.com

INTRODUCTION

The surgery of wall defects has always been an important pawn in improving the quality of life for patients and has often entered the field of elective surgery, although it has potential important complications due to natural evolution.The development of technology has led to improved techniques and in recent decades it has conducted the evolution of the materials used, from synthetic materials to biological ones, the alloplasty thus becoming nowadays the golden standard in the cure of parietal defects; recently, laparoscopy widely expanded its indications.

Intraperitoneal fixation of common meshes predisposes the patient to adhesion formation in 80-100% of cases(1). The dual layer meshes were designed to reduce the risk of adhesion. The collagen layer over the polypropylene mesh helps the integration process of the mesh, decreases the postoperative adhesions and lowers the rate of the mesh contraction(2). The inflammatory process that supports integration and mesh contraction has the most important role in the mesh acceptance by the host (3).

The opportunity to verify the incorporation process of the mesh is rare, although animal studies have been conducted to track the evolution of the first week intraperitoneal prosthesis (4). The present case has given us this that opportunity: to see the adherence reaction obtained after applying Dual Mesh.

MATERIAL AND METHOD

The abdominal wall has complex functions, the most important of which are the role in the torso's movements and the abdominal viscera contention.A significant challenge is getting a result in surgery as close to the genuine anatomical version, preserving and facilitating all functions of an integrum wall.This aspect is of a paramount importance in certain patient categories, e.g. performance athletes.

We report on the case of a female patient, 29 years of age, a multiple national and international karate champion with 18 years of competition experience, admitted for pain in the left iliac fosa, with inferior iradiation, enhanced by cough and effort. At clinical examination we could spot a direct reducibleinguinal hernia on the left side of the abdominal wall.The patient had no other significant pathology and was otherwise healthy. A year and a half beforehand, the patiend had suffered a surgical intervention for alloplastic repair of a left Spiegel hernia; a 15X15 cm intraperitoneal mesh was inserted at that time, Parietene Composite®, fixed with titanium tacks.

Considering the risk factor – the daily sport activity – we decided to procede with the surgery for inguinal hernia alloplastic cure. This laparoscopic technique consists of: pneumoperitoneum, dissection of the peritoneum in the inguinal area, fixation of a mesh using absorbable tacks and peritoneum closure.

Entering the peritoneal cavity we sieved adhesive disease at the edges of the mesh and on the nonabsorbable tacks used in the first surgery. The sigmoid colon is the main anatomic element involved in the adherence process. (figures 1, 2,3).

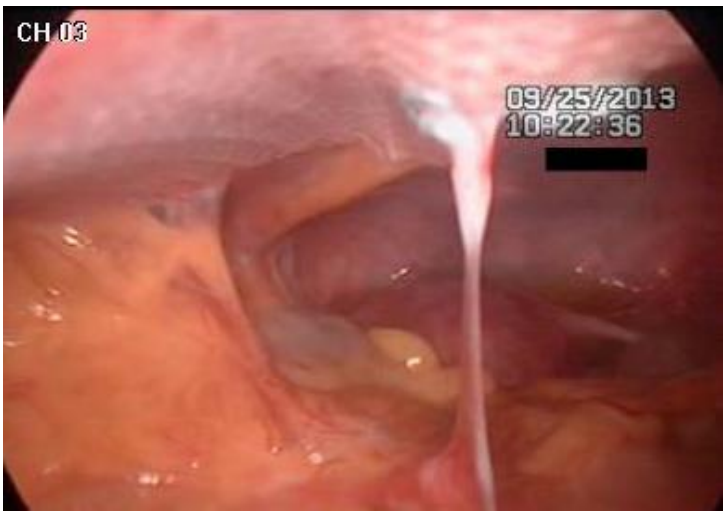


Figure 1. Adhesion on non absorbable tack and on the edges of the old composite mesh

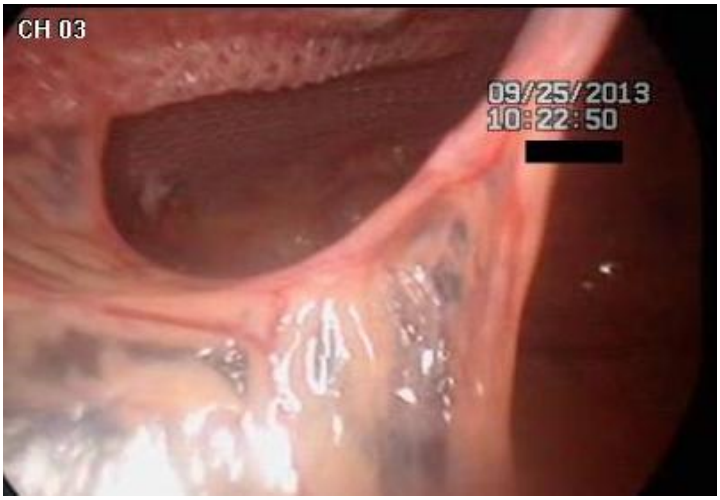


Figure 2. Adhesions developed on the edges of the mesh and on tacks used for fixation

Figure 3. Sigmoid colon on the lower edge of the mesh- close adhesion

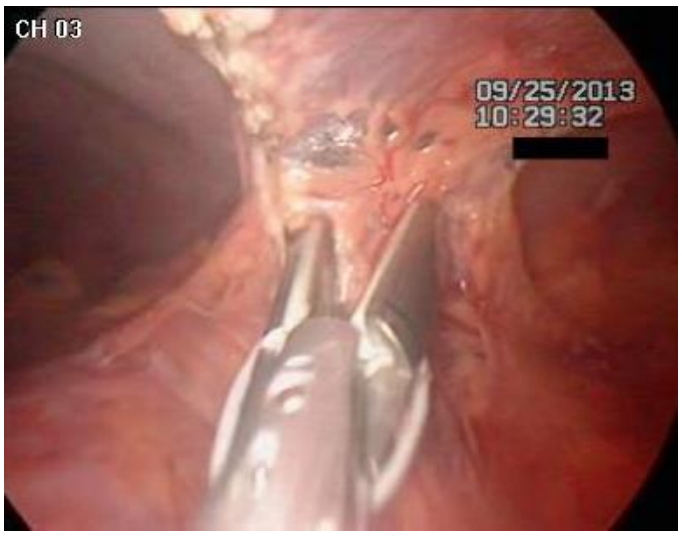


Figure 4. Dissection of the adhesion

Dissection is performed with great difficulty(figure 4), the bowel adhesions formed being the main problem of layer preparation(figure 5)before and after the introduction of the mesh (figure 6), and it is followed by the prior described intervention. The surgery lasted for 40 minutes and ended with closure of the peritoneal breach.

Figure 5. Dissection in the inguinal area with increase attention to sigmoid spare

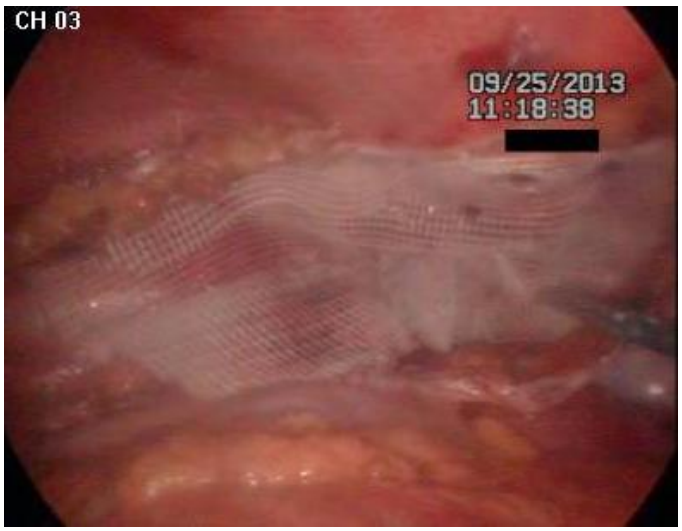


Figure 6. Insertion and fixation of the mesh, for inguinal hernia repair

Figure 7. Closing of the peritoneal breach, with careful sparing of the sigmoid

The patient had favorable outcome, was discharged next day, with minimal pain. She returned to her usual practice and sports activity within a month from the day of surgery.

DISCUSSIONS

The necesity of using synthetic or biological meshes is widely aknowledged. The advantages of laparoscopy are also a given fact(5): grants confort for the surgeon as well as for the patient, hastens the social integration of the latter, reduces the risk of relapse and the complications, shortens the period of hospitalization; moreover postoperative pain decreases to minimum. Combining the two means employing a certain type of mesh, the composite mesh (6,7).

The materials used in repairing parietal defects, as well as the surgical trauma itself are promotersofthe healing processes, tissue reparation and strengthening of the abdominal wall, in order to achieve the necessary mechanical resistanceafter healing.The main processes involved are the regeneration that restores tissue architecture and function to those before the onset of pathology and the healing that occurs without restoring the original quality, fibrosis and scar tissue.

Tissue healing phases are:

- Inflammatory / reactive phase: initiating the inflammatory response, increased vascular permeability, migration and activation of inflammatory cells. PMN, macrophages and lymphocytes play an important role in this phase (8).
- Proliferative phase: newly formed tissue angiogenesis. The macrophages play an important role in this phase.
- Maturation and remodeling phase: decrease vascular network and of the number of cells, collagen network densification and growth.

After implantation of a synthetic mesh, the body exhibits various reactions: interaction with the material implanted, provisional matrix formation, acute inflammation, chronic inflammation, granulation tissue development, foreign body reaction and fibrosis development (9,10). The foreign body generates a cascade of events that ends with the integration of the mesh: cell activation, angiogenesis, migration, phagocytosis and fibrosis (11). Following the inflammatory reaction, in the network gaps there is mainly adipouse tissue, the conjunctival reaction taking place at the thread's level (12). In time, the zone with the mesh will increase stiffness

and reduce range of motion, the fibrous area developed being a scar area in its nature.

Postoperative adhesive disease arises as exudative inflammatory process in response to a trauma, involving the formation of fibrin, fibroblasts, macrophages and neoformation vessels. Additional forming of fibrous bridges increases scar tissue and mesh retraction.

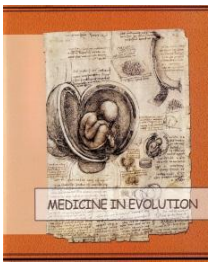
CONCLUSIONS

The particular features of this case that justify our choice for presentation are: the subjects' main occupation that predisposes to parietal injury via mechanical stress, the fact that the female patient we report on had a very thin abdominal wall that increased her chances to develop hernias and not for last, because we rarely are offered the opportunity to see how a mesh is incorporated. Because both of the surgeries were laparoscopical and because the lesions were located on the same abdominal side but on different levels and with different mechanisms, we could easily observe how the host reacted to the mesh after a year and a half. We could prove that the collagen layer on the composite dual mesh is extremely important in the process of prevention of the adherences since the adhesions were formed where this layer ended and at the level of the titanium tacks. This particular development of the adherence dissease made our current surgery more difficult from a technical point of view, due to the involvement of the sigmoid in the peritoneal adhesion. Although significantly decrease the rate of adhesions, dual composite meshes prove to be less than perfect, as foreign body rejection by the host organism still remains a problem (13).

REFERENCES

1. Balique J. G., Benchetrit S.,J. Bouillot L., Flament J. B., Gouillat C., Jarsaillon P., Lepère M., Mantion G., Arnaud J. P., Magne E., Brunetti F. - Intraperitoneal treatment of incisional and umbilical hernias using an innovative composite mesh: four-year results of a prospective multicenter clinical trial, Hernia March 2005, Volume 9, Issue 1, pp 68-74
2. Schumpelick V, Fitzgibbons RJ, Hernia Repair Sequelae, Springer, 2010
3. Bellón JM, Rodríguez M, García-Honduvilla N, Pascual G, Gómez Gil V, Buján J.,Peritoneal effects of prosthetic meshes used to repair abdominal wall defects: monitoring adhesions by sequential laparoscopy.,J Laparoendosc Adv Surg Tech A. 2007 Apr;17(2):160-6.
4. Nardi MJ, Millo P, Brachet Contul R, Fabozzi M, Persico F, Roveroni M, Lale Murix E, Bocchia P, Lorusso R, Gatti A, Grivon M, Allieta R.,Laparoscopic incisional and ventral hernia repair (LIVHR) with PARIETEX™ Composite mesh.,Minim Invasive Ther Allied Technol. 2012 May;21(3):173-80. doi: 10.3109/13645706.2012.671178
5. Courtney M., Beauchamp D., Textbook of surgery-The biological basis of modern surgical practice, 17-th ed, Elsevier Saunders, 2004, (183-198)
6. Luttikhuizen DT, Harmsen MC, Van Luyn MJ. Cellular and molecular dynamics in the foreign body reaction. Tissue Eng. 2006;12(7):1955–70)
7. Klinge U, Klosterhalfen B, Muller M, Schumpelick V. Foreign body reaction to meshes used for the repair of abdominal wall hernias. Eur J Surg 1999;165:665-73
8. Sadava EE, Krpata DM, Gao Y, Rosen MJ, Novitsky YW; Wound healing process and mediators: Implications for modulations for hernia repair and mesh integration.; J Biomed Mater Res A. 2013 Apr 30. doi:10.1002/jbm.a.34676

TUBO-OVARIAN ABSCESS AFTER DIVERTICULITIS ON A PREVIOUSLY HYSTERECTOMISED PATIENT



G. ROMOSAN[1,2], D. GRIGORAS[1], A. BLIDISEL[3]

[1]Department of Obstetrics and Gynecology nr 1, University of Medicine and Pharmacy, Victor Babes, Timisoara, Romania
[2]Department of Obstetrics and Gynecology, Skåne University Hospital Malmö, Lund University, Malmö, Sweden
[3]Department of Surgical Semiology, University of Medicine and Pharmacy, Victor Babes, Timisoara, Romania

ABSTRACT

Tubo-ovarian abscess (TOA) is considered usually an end-stage process of acute pelvic inflammatory disease (PID) when pathogenic bacteria enter from the vagina through cervix in the pelvis. We present here the case of a patient diagnosed 7 years after a hysterectomy with a TOA that turns out to be secondary a sigmoideum diverticulitis. It was treated conservatory with ultrasound guided drainage and broad spectrum antibiotics This case shows us that TOA can be present even after hysterectomy due to other inflammatory conditions in the pelvis (appendicitis, diverticulitis etc.). We also talk about the current treatment methods of TOA and the importance of the vaginal ultrasound in finding right diagnose.

Key words: *tubo ovarian abscess, hysterectomy, diverticulitis*

Correspondence to:

Dr. Gina Romosan
Address: Department of Obstetrics and Gynecology nr 1, University of Medicine and Pharmacy, Victor Babes, Timisoara, Romania
Phone: +4 0735312601
E-mail address: gina.romosan@gmail.com

INTRODUCTION

Tubo-ovarian abscess (TOA) is considered usually an end-stage process of acute pelvic inflammatory disease (PID), when a patient with PID has a pelvic mass that is palpable during bimanual examination. The condition reflects an agglutination of pelvic organs (tube, ovary, intestines) forming a palpable complex.

PID is considered a devastating disease that primarily affects women in the reproductive age group but not limited to them if conditions permit pathogenic bacteria to enter the internal genital organs. The genital tract can be viewed as a conduct leading from microbe-contaminated areas (vagina, and cervix) to sterile areas (uterus, fallopian tubes, pelvic cavity) (1). The inflammation may be present at any point along this continuum, clinically manifesting as cervicitis, endometritis, salpingitis or peritonitis. It is most often caused by the sexually transmitted micro-organisms Neisseria Gonorrhoea and Chlamydia Trachomatis (2) and even Mycoplasma Genitallium, (3) but also lower genital tract flora such as Bacteroides, Poststreptococcus and Prevotella and microflora associated with bacterial vaginosis (4). Occasionally, an ovarian abscess can result from the entrance of micro-organisms through an ovulatory site (5) or having as start point another inflammatory condition in the pelvis (appendicitis, diverticulitis) (6, 7).

TOA can be diagnosed with good performance by ultrasound, the sonographic appearance of this condition being total breakdown of the normal adnexal architecture with formation of a conglomerate where neither the ovary nor the tubes can be separately recognized as such (8).

Computer tomography (CT) is another diagnostic imaging technique with good results, but higher costs. The CT findings suggestive of TOA are a low density pelvic mass with a peripherally enhanced wall, anterior displacement of the round ligament, inflammatory change of adjacent organs and the presence of tubular or cystic satellite lesions adjacent to the main mass (9).

CASE PRESENTATION

We present the case of a 52 year old women which comes to the emergency department with acute abdominal pain and fever. From the medical history we note she was Para 2, had undergone appendectomy in the past and an interadnexal hysterectomy in 2006 because of cervical dysplasia. In 2007 had mild diverticulitis with a second episode 2 months before. Currently was not on any medications. She presents to the surgical emergency department in September 2013, with a couple of days history of low abdominal pain, initially constipated but after using laxative had diarrhea. Comes to the hospital because the abdominal pain became worse and she also got fever and chills. She denies any pathological discharges or vaginal bleeding. Her triage vital signs were blood pressure (BP) 135/65 mm Hg, pulse 100 beats/min, and temperature 39.3°C.

Abdominal examination revealed tenderness at palpation in the lower part but no muscular defence; per rectum palpation gives the suspicion of a pelvic mass and a CT is ordered.

Initial venous blood proves showed a high elevated level of reactive protein C (CRP) at 29 mg/ml, WBC count 9.8/mm^3 and normal renal, hepatic and electrolytes values.

The CT scan shows diverticuli in sigmoid and the descending colon, but

also a multicystic fluid filled capsulated mass measuring 64x55 mm in the right fossa (Figure1), that could represent an abscess due to a sigmoid diverticulitis or a tubo-ovarian abscess.

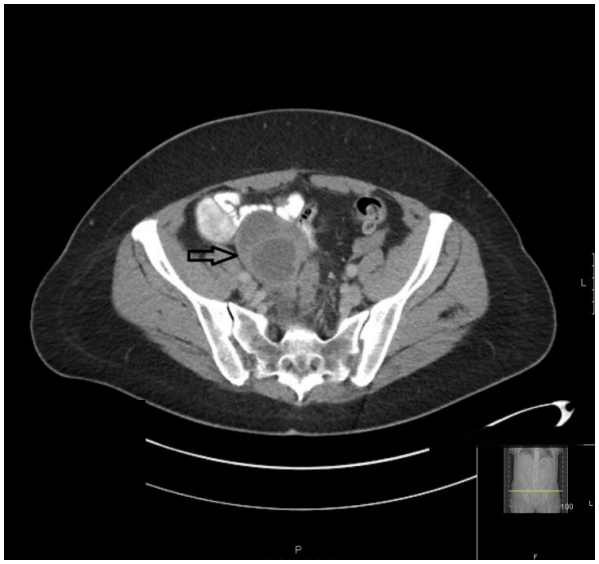


Figure 1. CT picture of a capsulated and septated fluid filled mass (arrow), lying adjacent to the distal sigmoid

In the view of these findings, a gynaecological consult is requested. The speculum examination showed a smooth and normal vaginal cuff. Bimanual palpation elicited right adnexal tenderness. A vaginal ultrasound shows in the right fossa a four chamber fluid filled mass measuring 85x65x60 mm with thick, rich vascularised walls. The intestines seem fixated to this mass and a suspicion of a fistula between the two erases (Figure 2).

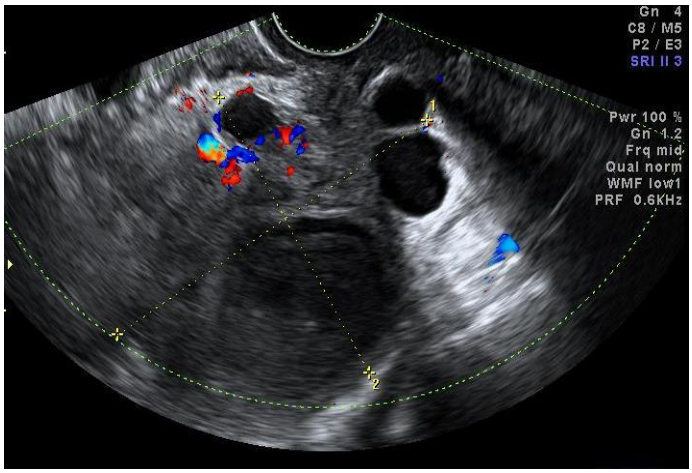


Figure 2. Ultrasound picture of a multicystic mass with thick and rich vascularised walls, containing heterogenic fluid

Intravenous antibiotic treatment with Cefotaxim and Metronidazol, has been started from admittance after cultures were taken from blood and urine.

On day 3 after the CRP has gone up to 261mg/dl and WBC count 18.4/mm a diagnostic laparoscopy is performed by a team of surgeons and gynaecologists. A big cystic mass is found in the right lateral fossa fixated to the abdominal wall. After separating out the cecum and the distal ileum, it remains a conglomerate involving the right adnexa and the sigmoid. Because of the intense inflammation, the

sigmoid can only be partially separated, but it is than suspected to be intact. The mass is punctured and thick fluid comes out, that is sent for culture. Because of strong inflammation and risk to damage the intestines, the decision is taken to finish the operation and to continue with antibiotic treatment. During next days the patient is clinically recovering, the lab values turn to normal and on day 6 after admission she is released with oral antibiotic treatment. The culture taken during the laparoscopy came positive for Streptococcus anginosus, Pepstreptococcus harei and Fusobacterium species which was sensitive to the antibiotics administered.

3 weeks after going home, the patient returns to the emergency room with the same complains, placing a drain is tried without success because the capsule is too hard, but the patient's condition improves quickly after parenteral antibiotics and she is released. Returns after 2 weeks and a new CT scan is performed that shows a slightly bigger mass in the right fossa having the sigma attached to it. This time it seems obvious the sigmoid involvement in the abscess and the condition is considered to have as primary focus a diverticulitis abscess. Ultrasound guided drainage of the abscess succeeds and together with broad spectrum intravenous antibiotics the mass decreases in size at CT and the patient is clinically well and the lab values returned to normal. She is released with oral antibiotic treatment and ambulatory planned follow-up with an eventual operation in a calm moment in case of persistence of the mass.

DISCUSSIONS

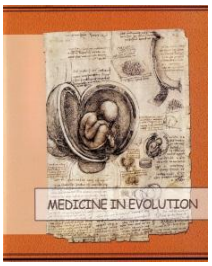
A TOA in a patient that has previously undergone hysterectomy is not a usual find, since after interrupting the continuum of the genital tract by removing the cervix and uterus, the bacteria from a microbe-contaminated area (vagina) should not be able to ascend to the pelvic cavity. But the presence of bacteria in the abdomen can also be due to an internal focus. There are described in the literature cases of TOA after diverticulitis (7), appendicitis (6) and also TOA years after hysterectomy without an apparent focus (10, 11).

The treatment of a TOA had undergone changes during the years. If three decades ago, surgical treatment was chosen immediately and often with performing bilateral salpingooforectomy and sometimes also hysterectomy, lately the increase use of broad spectrum antibiotics has showed a success rate of 70% or greater in the conservative management of TOA (12) and surgery remained actual as primary treatment for those patients with suspicion of ruptured TOA or poor response to antibiotics. But the best results were showed to be obtained by combining antibiotics with ultrasound guided drainage, with 93.4% successful rates (13). In our case, a partial drainage was performed during the diagnostic laparoscopy and a first ultrasound guided drainage failed because of the hard capsule, but later succeeded and the patient recovered with combining drainage and antibiotics.

The particularity of this case is that it shows that TOA can be present even after a hysterectomy; it also emphasizes the importance of the imagistic methods of diagnose, especially the vaginal ultrasound that can during examination follow real time movements of intestines and appreciate the mobility of organs and even suspect the presence of fistulas.

REFERENCES

1. Bieber EJ, Horowitz IR, Sanfilippo JS. Clinical gynecology. Edinburgh: Churchill Livingstone; 2006. xvii, 1003 p. p.
2. Soper DE, Brockwell NJ, Dalton HP. Microbial etiology of urban emergency department acute salpingitis: treatment with ofloxacin. Am J Obstet Gynecol. 1992;167(3):653-60. Epub 1992/09/01.
3. Weinstein SA, Stiles BG. A review of the epidemiology, diagnosis and evidence-based management of Mycoplasma genitalium. Sexual health. 2011;8(2):143-58. Epub 2011/05/20.
4. Hillier SL, Kiviat NB, Hawes SE, Hasselquist MB, Hanssen PW, Eschenbach DA, et al. Role of bacterial vaginosis-associated microorganisms in endometritis. American journal of obstetrics and gynecology. 1996;175(2):435-41. Epub 1996/08/01.
5. Berek JS, Novak E. Berek & Novak's gynecology. 14th ed. Philadelphia, Penn.: Lippincott Williams & Wilkins; 2007. xxii, 1671 p. p.
6. Acker S, Bazella C, Ponsky T. Tubo-Ovarian Abscess Following Perforated Appendicitis in an Adolescent. Journal of gynecologic surgery. 2011;27(1):37-9.
7. Naliboff JA, Longmire-Cook SJ. Diverticulitis mimicking a tuboovarian abscess. Report of a case in a young woman. The Journal of reproductive medicine. 1996;41(12):921-3. Epub 1996/12/01.
8. Molander P, Sjoberg J, Paavonen J, Cacciatore B. Transvaginal power Doppler findings in laparoscopically proven acute pelvic inflammatory disease. Ultrasound in obstetrics & gynecology: the official journal of the International Society of Ultrasound in Obstetrics and Gynecology. 2001;17(3):233-8. Epub 2001/04/20.
9. Jeong WK, Kim Y, Song SY. Tubo-ovarian abscess: CT and pathological correlation. Clinical imaging. 2007;31(6):414-8. Epub 2007/11/13.
10. Mendez LE, Bhoola SM, Horowitz IR. Bilateral tubo-ovarian abscesses four years after total abdominal hysterectomy. Infectious diseases in obstetrics and gynecology. 1998;6(3):138-40. Epub 1998/10/24.
11. Canas AM, Holloran-Schwartz B, Myles T. Tuboovarian abscess 12 years after total abdominal hysterectomy. Obstetrics and gynecology. 2004;104(5 Pt 1):1039-41. Epub 2004/11/02.
12. Sweet RL, Gibbs RS. Infectious diseases of the female genital tract. 4th ed. Philadelphia: Lippincott Williams & Wilkins; 2002. 719 p. p.
13. Gjelland K, Ekerhovd E, Granberg S. Transvaginal ultrasound-guided aspiration for treatment of tubo-ovarian abscess: a study of 302 cases. American journal of obstetrics and gynecology. 2005;193(4):1323-30. Epub 2005/10/06.



ASSOCIATION OF SELF-PERCEIVED BODY WEIGHT STATUS AND THE WISH TO LOSE WEIGHT IN YOUNG ADULTS: RESULTS OF A CROSS-SECTIONAL SURVEY

IOANA TUȚĂ-SAS[1], CRISTINA PETRESCU[1], CORNELUȚA FIRA-MLADINESCU[1], SALOMEIA PUTNOKY[1], OANA SUCIU[1], RADU BAGIU[1], IOAN SAS[2], DENIS ŞERBAN[3], COSTELA ŞERBAN[4], BRIGITHA VLAICU[1]

[1]"V. Babeş"University of Medicine and Pharmacy Timişoara, School of Medicine, Department of Hygiene
[2]"V. Babeş"University of Medicine and Pharmacy Timişoara, School of Medicine, Department of Obstetrics and Gynecology
[3]"V. Babeş"University of Medicine and Pharmacy Timişoara, School of Medicine, Department of Microbiology
[4]Statistica Medicală Dr. Șerban Freelance

ABSTRACT

Background: Despite public health concern, obesity becomes more common among young people. The self-perception of weight status often differs from the objective weight status. The objective of the present study was to assess in a young adults population the self-perception of weight appropriateness, and then to investigate the effect of different factors on the weight loss attempts.

Methods: We conducted a cross-sectional study using a representative sample of 2076 students from Timis County, Romania. A questionnaire was developed (CORT 2004) in order to determine the BMI (body mass index), the self-perception of weight and the intention of the respondents to modify their weight in the future. We used a logistic regression model to assess the predictive effects of chosen variables on weight-control actions the respondents intend to take.

Results: 219 (10.8%) normal weight people consider themselves to be underweight, and 436 (21.5%) misclassified themselves as overweight. 62 (3.1%) overweight persons consider themselves to be normal weight and 10 (0.5%) overweight persons consider themselves underweight. We applied multinomial logistic regression for three independent variables: sex, weight classification according to BMI and self-perceived weight status. The model containing these predictors is statistically significant, $\chi^2(5)=1027.74$, $p<0.001$, resulting that the proposed model can identify the students wanting to reduce their weight and those that have other options. The model explains between 39.8 and 53.5% of the variance of choice to reduce or not the body weight and is able to correctly classify 80.8% of the cases.

Conclusion: Many young adults misclassify their weight status and women are more likely than men to perceive themselves to be overweight. The self-perceived weight status is the most important predictor among the factors considered in the model for the subsequent wish to lose weight. Future public health programs aimed at weight related health outcomes must take into account the social and cultural factors influencing the perception of one's body size, as, for example, sex.

Key words: *obesity, overweight, weight perception, young adults*

Correspondence to:

Ioana Tuță-Sas
MD, PhD
Address: University of Medicine and Pharmacy Timişoara, Department of Hygiene, 16 Victor Babes Str, 1st floor, Timisoara, Romania
Phone: +4 0722329834
E-mail address: ioanasastm@yahoo.com

BACKGROUND

In modern society, obesity is described as epidemic and considered to be a major public health concern. The most representative country for the development of this epidemic is the United States. Studies show an alarming increase in obesity rates in the United States and other industrialized countries and that over half the adult population is now overweight or obese. Many developing countries, where there has been a dramatic shift from undernutrition to overnutrition are also experiencing a marked rise in obesity and obesity related diseases, including hypertension, type 2 diabetes, and cardiovascular disease [1 - 3]. In European countries, about 20% of children and adolescents and 30 to 80% of adults are overweight or obese with rising secular trends. High levels of overweight affect both Eastern and Western European countries [4, 5, 6].

These changes have occurred although the dominant cultural ideas favor persons with lower body weight, and despite national public health directives to reduce the prevalence of overweight [7]. Such state reflects the difficulties of losing weight, but it may also reflect a variation in body standards. The self-perceived appropriateness of weight status varies in highly predictable ways among population-level subgroups, likely reflecting differences in the evaluation of bodily weight standards [2, 8].

Previous studies show that there is a strong association between self-perceived weight status and weight control behavior, often independently of objective weight status [9, 10]. Studies on weight control practices have shown that there are many clinically normal weight persons attempting to lose weight, while some overweight persons are not [11, 12].

The present study investigates a young adult population. This population category is very important, being the age group where the dietary patterns stabilize, and also they represent the future adults. Young people are extremely preoccupied with their own image. The major problems for them are either that they are too thin or too fat, or too tall or too short. There is always present the tendency to compare to the models on magazines' covers. In a number of cases a real psychopathology develops in young people, especially in the feminine gender, fueled by the impossibility to fit the society's standards. Ignoring one's weight is also a possibility. Out of lack of time or possibilities, or out of pure commodity, the excessive accumulation of body weight is not corrected, and in time is more and more difficult to lose the accumulated kilograms. Social and cultural factors mediate the way young people perceive their body size, and this perception vary in predictable ways among population subgroups. Self-perceived weight appropriateness may be an important point of focus for the design and implementation of clinical and public health initiatives, those employing a uniform strategy of approach to the population may not be efficacious. [2, 8].

In this study, we use data from CORT 2004 survey to assess, in the Romanian young adult population, the self-perception of weight appropriateness. We than investigate the effect of more factors on the weight-loss attempts. We hypothesize that the self-perception of weight status and the respondent's gender may influence the future weight control strategies.

MATERIAL AND METHOD

This study is based on the grant "The evaluation of risk behavior dimension in high school students and young people from vocational schools and universities in Timis County"(CORT 2004), carried out between 2003-2006, cod CNCSIS 1167, attained at "V. Babeş"University of Medicine and Pharmacy Timişoara. The CORT 2004 study is a transversal epidemiologic survey assessing risk behavior in a group of young people attending the colleges and universities in Timis County.

The CORT 2004 Survey was performed with the approval of the Ethics Committee of the "V. Babes"University of Medicine and Pharmacy Timisoara.

The survey was carried with the written approval of the universities and colleges from Timis County which participated in the study. The rectors and headmasters of these institutions, as well as the professors, were informed on the methodology.

The participants were included in this study based on their free consent. The research was carried out in compliance with the Helsinki Declaration.

We conducted a cross-sectional study using a representative sample of students for the Timis County, Romania. The students sample from Timis County was composed of 2076 students from universities in the urban environment. Among this sample, the distribution was as it follows: 62.49% (1296) girls and 37.51% (778) boys. The individuals participating in this study were young adults, meaning their age was between 18 years (0.3%) and 25 years (3%).

A 126-item questionnaire was developed to investigate health-risk behaviors of young adults. Some of the questionnaire items were modified from other instruments, including the 1999 Youth Risk Behavior Survey (YRBS) [13] and the European School Survey Project on Alcohol and Other Drugs (ESPAD) [14]. The survey focused on health risk behaviors established during the period of young adulthood that results in the most significant mortality, morbidity, disability, and social problems for youths and, later, adults. A pilot test was conducted to establish the validity and reliability of the instrument.

The participants were included in this study based on their free consent. The questionnaire was administered in a regular classroom setting and took students 60 minutes to complete. No filter questions were used. By doing this, comparable amounts of time are required to complete the questionnaire, regardless of risk behavior status and students cannot detect the risk behaviors of their colleagues simply by looking at the pattern of the responses. Only students present the day of the survey were eligible for participation. Trained public health residents and undergraduate students conducted the survey. The data collectors read aloud scripts that explained the survey procedures. Students were told that they do not have to put their names on answer sheets, and that obtained data would be used only for general assessment of the situation in the county.

The self-evaluation of weight status was represented by choosing one of the 5 possible answers to the question: How do you consider your weight? a) Much under normal value; b) Little under normal value; c) Around normal value; d) Little over normal value; e) Much over normal value. The medical classification of weight status was based on BMI (body mass index), which is defined as weight (in kilograms) divided by the square of height (in meters).

Data were filed using Epiinfo, version 6.0, 2001 and processed using Epiinfo, version 3.5.1, 2008. The values of the statistical significance level

$p<0.05$ were considered statistically significant, and $p<0.01$ were considered very significant statistically. We used a logistic regression model to assess the predictive effects of chosen variables on weight-control actions the respondents intend to take.

RESULTS AND DISCUSSIONS

The majority of respondents, 58.1% (1192), want to lose weight. Based on the BMI, 17.9% (368) are underweight, 69.7% (1432) have normal weight and 12.4% (255) are classified as overweight.

Table 1 displays a cross-tabulation of objective weight status (classified according to BMI), with self-perceived weight status. 362 (17.8%) respondents are underweight, but only 130 (6.4%) correctly classified themselves. 206 of the underweight people misclassified themselves as normal weight and 26 persons consider themselves to be overweight. 69.7% (1414) of the respondents have normal weight and 759 (37.4%) correctly classified themselves. 219 (10.8%) normal weight people consider themselves to be underweight, and 436 (21.5%) misclassified themselves as overweight. 254 (12.5%) respondents are overweight, and 182 (9.0%) of them correctly classified themselves. 62 (3.1%) overweight persons consider themselves to be normal weight and 10 (0.5%) overweight persons consider themselves underweight. The majority, 1071 (52.8%) of the respondents, correctly classified themselves. Similar results were obtained by previous studies [8].

27.1% of the female respondents consider their weight exceeds the normal limit, although their BMI is normal. On the other hand, only 12% of the male respondents perceive themselves as overweight or obese, their BMI being normal. Women are more likely to perceive themselves to be overweight than men, as many previous studies showed [2, 4, 8, 11, 15].

Table 2 displays the results of multinomial logistic regression, used in order to assess the impact of more factors on the wish to lose weight in the students' sample. The model contains three independent variables (sex; weight classification according to BMI in 3 classes: underweight, normal weight, and overweight; self-perceived weight status with three classes: underweight, about normal weight and overweight). The model containing these predictors is statistically significant, $\chi^2(5)=1027.74$, $p<0.001$, resulting that the proposed model can identify the students wanting to reduce their weight and those that have other options. The model explains between 39.8 and 53.5% of the variance of choice to reduce or not the body weight and is able to correctly classify 80.8% of the cases.

Compared to the students that perceived their own weight as under normal values, the respondents with self-perceived weight exceeding normal have 45.5 times more chances to wish to reduce the present body weight. Compared to the students seeing themselves as normal weight, those perceiving themselves as overweight have 16.7 more chances to wish to reduce their weight.

The overweight students (based on BMI measurements) have 9.0 times higher chances compared to underweight students and 1.9 times higher chances compared to normal weight students to wish to lose weight.

Sex is another statistically significant predictor in the model, females wishing 3.86 times more frequently than males to reduce their body weight.

We found that the self-perceived weight status is the most important predictor among the factors considered in the model for the subsequent wish to

lose weight. A large number of the young adults misclassify their own weight status relative to medical standards. A large fraction of those who registered themselves as overweight were actually normal weight, aspect emphasized by other studies too [2, 8].

Consistent with previous studies, this study showed that normal weight women perceive their weight as being larger than normal more often than the men. A previous study [8] showed that compared to men, women were almost five times more likely to overassess their body size. It appears that overweight men tend to tolerate their weight, while a large portion of normal weight women feel that they are overweight. Many studies have reported that women are much more likely than men to be dissatisfied with their body image [2, 4, 8, 10, 16, 17], a finding consistent with the notion that modern Western cultural ideas and popular media place an undue amount of pressure on women to be thin [2]. Higher weight consciousness among women related to a given BMI may reflect the difference in muscle to fat ratio between the sexes. A man and a woman of equal weight at a given height are likely to have different degrees of adiposity with different effects on their self-evaluation of body size [8].

Sex is also a significant predictor for the wish to lose weight in the future, women wanting more often than men to reduce their body weight. Modern society has intense preoccupation with the body, imposing rigorous standards of beauty and fitness, body weight being an issue of health, but also an issue of social status.

This study is subject to four important limitations. First, in the CORT 2004 Questionnaire height and weight are self reported and not directly measured. Many investigators have concluded that these self-reported values are an excellent approximation for actual values [18, 19, 20]. The second limitation is that BMI is only a proxy for body-fat content. Measurements based on height and weight are the most practical methods to estimate nutritional status due to their simplicity and low cost. Among these, BMI is most often recommended and is the most utilized in order to classify overweight and obesity in adults, and it was also recommended for the screening for overweight and obesity in adolescents [21, 22]. Third, the present study investigates only young people from universities in Timis County. This is an important limitation because people that are not attending university or dropped out of school represent a population category exposed to risk behaviors and unhealthy dietary patterns. Another limitation to this study is represented by the fact that we separated the respondents in only two groups based on their answer to the question: "What action do you intend to perform regarding your weight in the future?"The possible responses were: "a) to lose weight; b) to gain weight; c) to maintain the present weight; d) no action."All persons choosing one of the last three variants were included in the group that does not want to lose weight.

Table 1. Comparison of objective weight status with self-perceived weight status

Classification according to BMI		Self-perceived weight status			
		Underweight	About normal weight	Overweight	Total
Underweight	Count	130	206	26	362
	% of Total	6.4%	10.1%	1.3%	17.8%
Normal weight	Count	219	759	436	1414
	% of Total	10.8%	37.4%	21.5%	69.7%
Overweight	Count	10	62	182	254
	% of Total	.5%	3.1%	9.0%	12.5%
Total	Count	359	1027	644	2030
	% of Total	17.7%	50.6%	31.7%	100.0%

Table 2. Factors associated with the wish to lose weight in the future

		B	S.E.	Sig.	OR	95% C.I.for OR	
						Lower	Upper
Step 1[a]	sex(1)	1.353	.144	.000	3.868	2.916	5.130
	BMI classification			.000			
	Overweight/ obese	-2.198	.274	.000	.111	.065	.190
	Normal weight/obese	-.673	.205	.001	.510	.341	.762
	Self-perception of weight			.000			
	Self-perception Overweight/ obese	-3.801	.245	.000	.022	.014	.036
	Self-perception Normal weight/obese	-2.820	.149	.000	.060	.045	.080
	Constant	1.681	.187	.000	5.373		

CONCLUSIONS

Self-perception of weight status is a very important predictor for the wish to lose weight in the future. The weight status self-perceived by the person does not always reflect the real body weight, based on BMI. Future public health programs aimed at weight related health outcomes must take into account the social and cultural factors influencing the perception of one's body size, as, for example, the sex. The intervention strategies must differ related to population categories, in order to correctly motivate changing the life-style and thus, obtaining better efficiency.

Competing interests: The authors declare that they have no competing interests.

Author's contributions: ITS participated in the acquisition, analysis and interpretation of data and helped to draft the manuscript. CP contributed to conception and design of the study and the interpretation of data. CFM contributed to conception and design of the study and the interpretation of data. SP participated in the design of the study and the interpretation of data. OS participated in the design of the study and the interpretation of data. RB participated in the design of the study, in the acquisition and interpretation of data. DS participated in the acquisition and interpretation of data. CS participated in the acquisition and interpretation of data and performed the statistical analysis. BV conceived of the study, and participated in its design and coordination and revised the manuscript. All authors read and approved the final manuscript.

Acknowledgements

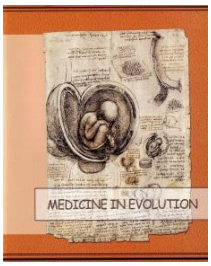
This study was supported by the grant "The evaluation of risk behavior dimension in high school students and young people from vocational schools and universities in Timis County"(CORT 2004), carried out between 2003-2006, cod CNCSIS 1167, attained at "V. Babeş"University of Medicine and Pharmacy Timişoara.

REFERENCES

1. Hu F., Obesity epidemiology, Oxford University Press 2008.
2. Chang V.W., Christakis N.A., Self-Perception of Weight Appropriateness in the United States, American Journal of Preventive Medicine 2003, 24 (4).
3. Mokdad A.H., Bowman B.A., Ford E.S., Vinicor F., Marks J.S., Koplan J.P., The continuing epidemics of obesity and diabetes in the United States, JAMA 2001, 286:1195-200.

4. Mikolajczyk R.T., Maxwell A.E., El Ansari W., Stock C., Petkeviciene J., Guillen-Grima F., Relationship between perceived body weight and body mass index based on self-reported height and weight among university students: a cross-sectional study in seven European countries, BMC Public Health 2010, 10:40.
5. WHO, Regional Office for Europe: The challenge of obesity in the WHO European Region and the strategies for response. 2007, http://www.euro.who.int/document/E90711.pdf.
6. Knal C., Suhrcke M., Lobstein T., Obesity in Eastern Europe: an overview of its health and economic implications. Econ Hum Biol 2007, 5:392-408.
7. U.S. Department of Health and Human Services., Healthy people 2000: national health promotion and disease prevention objectives. Washington DC: U.S. Dept of Health and Human services (DHHS publication (PHS) 1990, 90-50212.
8. Chang V.W., Chritakis N.A., Extent and Determinants of Discrepancy Between Self-evaluation of Weight Status and Clinical Standards, J GEN INTERN MED 2001, 16:538-543.
9. Riley N.M., Bild D.E., Cooper L., Schreiner P., Smith D.E., Sorlie P., Thompson J.K., Relation of Self-Image to Body Size and Weight Loss Attempts in Black Women, American Journal of Epidemiology 1998, Vol. 148, No. 11.
10. Crawford D., Campbell K., Lay definitions of ideal weight and overweight, Int J Obes 1999, 23: 738-45.
11. Weiss E.C., Galuska D.A., Khan L.K., Serdula M.K., Weight-Control Practices among U.S. Adults, 2001-2002, American Journal of Preventive Medicine 2006, 31 (1).
12. Bennett E.M., Weight-loss practices of overweight adults, Am J Clin Nutr 1991, 53: 1519-21.
13. ***, The Youth Risk Behavior Surveillance System, Department of Health and Human Services, Center for Disease Control and Prevention 2005, USA
14. Hibell B., Ansersson B., Bjarnason T., Ahlström S., Balakireva O., Kokkevi A., Morgan M., The ESPAD Report 2003 – Alcohol and Other Drug Use Among Students in 35 European Countries, The Swesish Council for Information on Alcohol and Other Drugs, The Pompidou Group at the Council of Europe and the authors, Sweden, 2004, modintryckoffset AB, Stockholm
15. Yancey K.A., Simon P.A., McCarthy W.J., Lightstone A.S., Fielding J.E., Ethnic and Sex Variations in Overweight Self-perception: Relationship to Sedentariness, Obesity 2006, 14: 6.
16. Strauss R.S., Self-reported weight status and dieting in a cross-sectional sample of young adolescents: National Health and Nutrition Examination Survey III. Arch Pediatr Adolesc Med 1999; 153: 741-7.
17. Kant A.K., Association of Self-perceived Body Weight Status with Dietary Reporting by U.S. Teens, Am J Clin Nutr.2002, 75 (Suppl. 2): 407S.
18. Stewart A.L., The reliability and validity of self-reported weight and height, J Chronic Dis. 1982, 35: 295-309.
19. Jeffery R.W., Bias in reported body weight as a function of education, occupation, health and weight concern, Addict Behav. 1996, 21: 217-22.
20. Paradis A.M., Perusse L., Godin G., Vohl M.C., Validity of a self-reported measure of familial history of obesity, Nutrition Journal 2008, 7:27
21. Mei Z., Grummer-Strawn L.M., Pitrobelli A., Goulding A., Goran M.I., Dietz W.H., Validity of body mass index compared with other body-composition screening indexes for the assessment of body fatness in children and adolescent, American Journal for Clinical Nutrition 2002, USA.
22. Gallagher D., Visser M., Sepulveda D., Pierson R.N., Harris T., Heymsfield S.B., How useful is body mass index for comparison of body fatness across age, sex and ethnic groups?, American Journal of Epidemiology 1996, 143: 228-239

THE ASSESSMENT OF FUNCTIONING IN PATIENTS WITH LUMBAR DISCECTOMY



DIANA ANDREI[1], ELENA AMĂRICĂI[1], DAN V. POENARU[2], DAN NEMES[1], IULIUS POPA[2]

[1] University of Medicine and Pharmacy „Victor Babeş"Timişoara, Rehabilitation and Rheumatology Department
[2] University of Medicine and Pharmacy „Victor Babeş"Timişoara, 2nd Orthopaedic Department

ABSTRACT

Aim and objectives. *To assess functioning and ability to perform different physical activities in patients with lumbar discectomy.*

Material and methods. *The study included 55 patients with lumbar disk hernia who needed surgical treatment (laminectomy or microdiscectomy). The patients were divided into two groups. Group 1 patients began rehabilitation in the early inpatient phase, followed in a specialised centre and at home. Group 2 patients followed rehabilitation only during the inpatient phase. All patients were assessed by Oswestry Disability Index (ODI) and by VAS scale preoperatively, at the beginning of the postsurgical rehabilitation and after 3 months.*

Results. *The patients of both groups had significant improvements of ODI and VAS scores after 3 months in comparison to initial and intermediate assessments. Group 1 patients had better results than group 2.*

Conclusions. *After lumbar discectomy patients should begin an early rehabilitation program followed by a long-term adapted physical training.*

Key words: *lumbar disc hernia, discectomy, rehabilitation, functioning*

Correspondence to:

Dr. Diana Andrei
PhD student
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Eftimie Murgu Square, no. 2A, RO-300041, Timisoara
Phone: +4 0256204400
E-mail address: andreidiana81@gmail.com

INTRODUCTION

Lumbar disc herniation is a disease that mostly affects young and active people (1,2,3). Lumbar spine dysfunction is a common cause of disability and a major concern in medical practice (4,5,6). In patients with lumbar disc herniation pain and disability have a negative impact on functional capacity and quality of life. The conceptual model of this study started from the premise that clinical assessment of pain, disability and functional capacity, and the detection of their correlations is the reference for appropriate therapies. Rehabilitation treatment must be taken into account in case of surgical therapy. It should take place before and after surgery, performed according the disease stage and its psychological, social, familial, educational and professional features or comorbidities (7). The early postoperative recovery followed by a long-term adapted physical training represents a real benefit for patients who needed surgical treatment in terms of pain and functioning. Kinetotherapy associated with adequate orthopaedic procedures have a major role in order to prevent or minimize disabilities in patients with lumbar disk herniation (8).

Aim and objectives

The main objective of this study is the assessment of functioning and ability to perform different types of physical activities in patients with lumbar disk hernia who needed a surgical treatment. Another objective is to compare the functioning status and pain level in patients who followed a short-term versus patients who followed a long-term rehabilitation.

MATERIAL AND METHOD

This is a prospective study that was performed in the 2nd Orthopaedic department of Timisoara County University and Emergency Hospital. The study was conducted between September 2011 and September 2013. All of the patients provided the informed consent.

Treatment

The study included 55 patients who were diagnosed with lumbar disk hernia and required surgical treatment (laminectomy or microdiscectomy). According to the extent of postoperative rehabilitation, the patients were divided into two groups (1 and 2). Group 1 patients (29 patients) began an early postoperative rehabilitation during the inpatient phase followed by a physical exercise program performed in a rehabilitation centre (see figures 1-4) and a home-adapted physical training. Group 2 patients (26 patients) followed only a short-term rehabilitation during the inpatient phase.

Figure 1-4. Exercises performed in a specialised centre during the outpatient rehabilitation

The patients were divided into the two groups taking into account their compliance to the medical recommendations regarding the postoperative rehabilitation. The patients' socio-demographic and clinical characteristics are presented in table 1.

Table 1. Demographic and clinical profile of the study patients (n=55)

	Group 1 (n-29)	**Group 2** (n-26)
Gender: Men	19	19
Women	10	7
Age (years)	42.5 ± 11.9	40.7 ± 13.2
Residential status: Urban	21	20
Rural	8	6
Profession: Employee	23	17
Retired	1	2
Unemployed	5	6
Housewife	0	1

n: number of patients

Assessment

The patients were assessed by Oswestry Disability Index (ODI) and by VAS scale preoperatively, at the beginning of the postoperative rehabilitation and after 3 months. ODI scale assesses pain intensity, sleeping, sex life, functioning activities regarding personal care, sitting, standing, walking and social life activities. Each question ranges from 0 to 5 points. A final ODI score is calculated. The functional significance of ODI scores are: 0-20% means minimal disability, 21-40% moderate disability, 41-60% severe disability, 61-80% crippled, 81-100% means that patients may be bed bound or exaggerating their symptoms (9, 10).

Statistical analysis

Continuous variables were expressed as mean ± standard deviation and were evaluated by the unpaired t test. Relationship between ODI and VAS scores were evaluated by Pearson correlation coefficients. All statistical analyses were done using GraphPad Prism 6.0 for Windows, and the significance was assessed at the level of 0.05.

RESULTS

The ODI and VAS scores were no significant different in the two study groups at initial and intermediate assessments. Instead, there were statistically significant differences in group 1 patients regarding both ODI and VAS score (see table 2). That means that patients with long-term rehabilitation had a better functional status and a relief of pain.

Table 2. ODI and VAS scores in the two study groups

	Preoperatively Group 1 (n-29)	Group 2 (n-26)	Early postoperatively Group 1 (n-29)	Group 2 (n-26)	After 3 months Group 1 (n-29)	Group 2 (n-26)
ODI score	79%±7%	76%±10% p=0.72	40%±5%	47%±4% p=0.068	25%±8%	34%±7% p=0.004**
VAS score	8.31±2.4	8.52±1.9 p=0.81	6.6±1.42	6.83±1.12 p=0.25	2.03±0.66	3.51±1.05 p=0.032*

n: number of patients; * statistically significant difference ($p<0.05$); ** statistically significant difference ($p<0.01$)

Group 1 patients returned to work significantly earlier in comparison to group 2 patients ($p<0.05$). The employee group 1 patients regained their professional activities after 45.6 (± 11.8) days, while the employee group 2 patients regained their professional status after 59.7 (±14.3) days (tabel 3).

Table 3. Correlations between VAS and ODI score, and between VAS, ODI score and number of days before returning to work

	$VAS_{initial}$-$ODI_{initial}$	VAS_{final}-ODI_{final}	VAS_{final}-Return to work	ODI_{final}-Return to work
Group 1 (n-29)	0.331 p=0.021*	0.78 p=0.001**	0.34 p=0.042*	0.823 p=0.001**
Group 2 (n-26)	0.34 p=0.034*	0.81 p=0.66	0.326 p=0.019*	0.44 p=0.036*

DISCUSSIONS

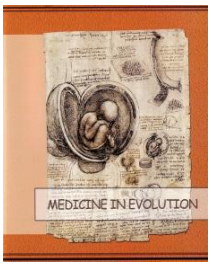
Data from the literature show that the start of an early rehabilitation protocol on long-term is more beneficial than just postoperative inpatient rehabilitation (11,12).

CONCLUSIONS

The patients with surgically treated lumbar disk hernia who followed a postoperative long-term rehabilitation had better functional results at final assessment in comparison to patients who followed just inpatient rehabilitation. After lumbar discectomy, the patients should begin an early rehabilitation program focused on physical exercises. These exercises are guided to regain the spinal range of motion and to perform independently the everyday activities with no pain. The physical training should continue in a rehabilitation centre for a specified period of time (between 1 and 3 months) and at home as a basic physical program for the entire life. Also, patients' education regarding the physical and professional activities, leisure and social activities is extremely important for their overall long-term functioning.

REFERENCES

1. Aguiar D. J., Johnson S. L., Oegema T. R. – Notochordal cells interact with nucleus pulposus cells: regulation of proteoglycan synthesis. Exp Cell Res 1999 Jan 10; 246(1):129-37.
2. Aldea H., Radulescu D., Dumitrescu G. - Aspecte histopatologice în Ţesutul discal herniat, ligamentul galben adiacent şi al apofizelor articulare adiacente, în Aldea H, red. Patologia degenerativă neurochirurgicală a coloanei vertebrale lombare. Ed. Dosoftei, Iaşi,1997
3. KIPPEL J H., DIEPPE PA. - Rheumatology. London Mosby; 1994
4. HaWLEY D.J., WORFE F. - Sensitivity to change of the Health Assessment Questionnaire (HAQ) and other Clinical and Health Status Measures in Rheumatoid Arthritis. Arthritis Care Res, 1992, vol. 5 (3), 130 – 6
5. HEMINGWAY H, STAFFORD M, STANSFIELD M, SHIPLEY M, MARMOT M. - Is the SF-36 a valid measure of change in population health? Results from the Whitehall II study. British Medical Journal, 1997, 3, 15:1273-1279
6. MCDOWELL I., NEWELL C. - Measuring Health: a Guide to Rating Scales and Questionnaires.Oxford University Press, New York, 1996
7. KRAMER J. - Intervertebral disc disease. 2nd Ed. Georg Thieme Verlag, New York, 1990;p 30.
8. miHAILOV MARIANA, MARIANA CEVEI - Recuperarea functionala in boli reumatologice. Editura Universitatii din Oradea, 2006
9. Fairbank JC, Couper J, Davies JB. The Oswestry Low Back Pain Questionnaire. Physiotherapy 1980; 66: 271-273.
10. Fairbank JC, Pynsent PB, The Oswestry Disability Index. Spine 2000; 25(22):2940-2952.
11. A structured protocol of evidence-based conservative care compared with usual care for acute nonspecific low back pain: a randomized clinical trial.Parkin-Smith GF, Norman IJ, Briggs E, Angier E, Wood TG, Brantingham JW.Arch Phys Med Rehabil. 2012 Jan;93(1):11-20. doi: 10.1016/j.apmr.2011.08.022.
12. Lumbar fusion compared with conservative treatment in patients with chronic low back pain: a meta-analysis.Saltychev M, Eskola M, Laimi K.Int J Rehabil Res. 2013 Jun 29. [Epub ahead of print].



THE INFLUENCE OF PERSONALITY TRAITS OVER THE SUBJECTIVE OUTCOME OF DECOMPRESSION BY DISCECTOMY IN CERVICAL DISC HERNIA

D. NEGOESCU[1], D.V. POENARU[2], I. POPA[2], SIMONA TAMASAN[3]

[1]Politraumatology Department - Casa Austria – Emergency County Hospital Timisoara
[2]2nd Orthopaedic Department – University of Medicine and Pharmacy "Victor Babes"Timisoara
[3]Psychiatric outpatients - Emergency County Hospital Timisoara - Romania

ABSTRACT

We had prospectively analyzed the influence of personality traits over the subjective result of decompression by discectomy in 42 patients with cervical disc hernia. The mean age of the patients was 58,3 years (38-62 years). The personality traits were assessed with the Freiburg Personality Inventory (FPI-R). After three months postoperatively, 37 patients were satisfied and 5 were dissatisfied by the outcome of the intervention. The VAS score for the radicular pain improved from 87,9 (50-100) points to 18,7 (0-30) points. A comparison made between the satisfied and the dissatisfied patients emphasized the statistically significant difference regarding the personality traits: aggresivity (p=0,001), extroversion (p=0,003) and hypochondry (p=0,04). Even though it was used the same surgical intervention, by the same surgical team that evaluated intraoperatively the degree of decompression, a small number of patients were dissatisfied by the surgical outcome, suggesting that the subjective outcome of the surgical decompression by discectomy in patients with cervical disc hernia may be influenced by the patient personality profile.

Key words: *cervical disc hernia, personality traits*

Correspondence to:

Dr. I. Popa
Address: 2nd Orthopaedic Department – University of Medicine and Pharmacy "Victor Babes"Timisoara
Phone: +4 0256434426
E-mail address: medexpe@gmail.com

INTRODUCTION

The decompression surgical intervention for cervical disc hernia is a frequently used surgical intervention. Sometimes the patients are not satisfied by the intervention outcome, even though an objective examination doesn't reveal any kind of complications. This personal experience encouraged us to conceive the present study. The objective of this prospective study was to analyze the hypothesis according to which the personality traits influence the outcome of the decompression by discectomy in patients with cervical disc hernia.

MATERIAL AND METHOD

Between November 2011 and March 2013, 42 consecutively patients were operated for cervical disc hernia by discectomy, positioning a tricortical bony graft obtained from the iliac crest and ensuring it by a cervical plate. The inclusion criteria were cervical disc hernia at only one level with radiculopathy and the duration of symptomatology between 2 and 4 months. After prior notifying of the patients, the informed consent was requested and signed, the surgical team performed the surgical intervention (the same procedure for all of the patients). After the surgical procedure, the patients wore the cervical orthosis for 2 months, were released during the fifth day and the sutures were removed in the 12th day. After the sutures were removed, the patients were reassessed after 6 months and after 3 months postoperatively, this being the final point of the study.

The clinical examination included the evaluation of the radicular pain according to the visual analogue scale (VAS). Preoperatively MRIs were compared with those obtained during the final check-out. During the final check-out, the satisfaction of the patients was rated as very satisfied, satisfied and dissatisifed.

The patients were interviewed twice, once the day before the intervention and the second time 12 weeks posteoperatively. All of the interviews were conducted by one of the authors that didn't took part in the surgical interventions or the imaging examination. The psychological paramaters were calculated using the Freiburg Personality Inventory (FPI-R). This is a German multidimensional test consisting in 10 personality traits and two dimensions of the personality (extroversion/introversion and emotional stability/instability), obtained by self-evaluation consisting of answering to 138 questions. The criteria are represented by social orientation, life satisfaction, the orientation towards performance, inhibition, excitability, aggresivity and emotional stability. The higher scores emphasize the pronounced expression of traits. The FPI-R standard is given by a representatively sample of German population, including 2035 subjects. The completion of the test took about 30 minutes for every patient.

The statistical analysis was made using SPSS for Windows. The descriptive statistics was calculated for clinical, imaging and psychometrical tests. In order to establish the group differences at the scale interval level, the authors used the t test for independent samples. In order to calculate the differences at the nominal level, the authors used the "chi-square". A p value lower than 0,05 was considered statistically significant.

RESULTS

The mean age of the patients at the time of the intervention was 58,3 years (38-62 years). After three months postoperatively, 37 patients were satisfied and 5 were dissatisfied by the outcome of the intervention. The preoperatively VAS score improved from 87,9 (50-100) points to 18,7 (0-30) points.

An analysis of the dissatisfied patients revealed during the final check-out a mean VAS of 28,4 (8-28). With all the patients, the MRI results were considered good. The patients returned to their normal daily activities after a mean of 8,3 weeks (7-9 weeks). The satisfied patients were on workers compensation for a mean of 8,1 weeks (7-9 weeks), and those dissatisfied - 8,4 weeks (8-9 weeks) (p<0,001).

PSYCHOMETRICAL RESULTS

The preoperatively FPI+R evaluation emphasized statistically significant difference between the two groups (satisfied and dissatisfied) regarding the aggresivity (p=0,001), extroversion (p=0,003) and concerning related to the health status (p=0,04). In other personality traits, no significant differences wer found.

DISCUSSIONS

The patient's satisfaction is an essential measure of the outcome, indicating the quality of the medical act with multiple clinical and economical implications [4]. In general, the postoperatively outcome is measured using clinical scores systems. Whereas many scoring systems are blamed for having little correlation with the overall outcome, the VAS score is considered a consensual score [8].

The patients' expectations following the surgical intervention are represented the absence of pain and of the paresthesia. Furthermore, a special care must be given to the surgical technique, in order to obtain a satisfactory and a lasting outcome. It is important to notice that the higher is the surgical interventions frequency, the higher the complications are, even when the intervention is performed by skilled surgeons. Nevertheless, the patient's satisfaction often includes a subjective component that makes this intervention different from other types of interventions.

Articles about the influence of psychological factors over the surgical interventions outcome were published [1,3, 6, 7, 9]. The study of Straub et al., in patients that were subject of an endoscopical release of the carpal tunnel, demonstrated a high incidence of dissatisfying outcomes in patients with a abnormal psychological profile (p<0,05) [6]. Also, emphasizing the importance of the influence of psychological stress in patients with chronic low back pain, it is considered that this factor must be closely observed before a major intervention [2]. In a recent study regarding the treatment of chronic lumbar pain, the patienst were randomized for surgical or conservatory treatment [1]. The outcomes showed that the personality characterized by low neuroticism was an important predictor for functional improving following the surgical treatment, the conclusion being that the selection of the patients using the evaluation of personality traits improves the surgical treatment outcome [1]. The studies regarding the patients that were subjected to lumbar discectomy [5] and spinal fusion [9] showed that the outcomes were influenced by the personality traits. By contrast, other studies showed that there is no significant difference regarding the lumbar discectomy outocme in normal patients, comparing to those that have psychological disorders [3] and the improving following posterior intervertebral

fusion (PLIF) is not related at all with the preoperatively psychological traits [7].

We have tested our patients' personality traits using the Freiburg Personality Inventory test. In dissatisfied patients we have observed a higher rate of aggresivity, extroversion and concerning regarding the health status within this study.The interpretation of aggresivity is like an increased ability to assert the personality. The term known as increased concerning regarding their health status is used for hypochondriacs and for increasing the aim of avoiding the lesions and risks, and the term known as extroversion is used for impulsivity and the tendency to be in a society. We are aware the this study has its limitations. First, the 3 months follow-up period can be considered a short one. Nevertheless, our opinion is that this is the interest period, because the majority of patients returns to daily activities without the presence of pain. Second, even though we found a statistical significant difference between the satisfied and dissatisfied patients regarding certain personality traits, we conducted the study over a small group. This is why we would like to emphasize the fact that a study including a larger number of patients followed over a longer period of time is necessary, in order to clarify the role of the psychological profile regarding the surgical intervention outcome.

Even though the decompression by discectomy in lumbar disc hernia is an adequate procedure, according to intraoperatively observations and imagistic parameters, some of the patients are not completely satisfied with the surgical intervention outcome. This dissatisfying results may be influenced by some personality traits like aggresivity, extroversion and health worries.

REFERENCES

1. Hagg O, Fritzell P, Ekselius L, Nordwall A (2003). Predictors of outcome in fusion surgery for chronic low back pain. A report from the Swedish Lumbar Spine Study. Eur Spine J 12:22-33
2. 2.Hanley EN, David SM (1999) Lumbar arthrodesis for the treatment of low back pain. J Bone Joint Surg Am 81:716-730
3. Hobby JL, LutchmannLN, Powell JM, Sharp DJ (2001) The distress and risk assessment method (DRAM). J Bone Joint Surg Br 83:19-21
4. Kocher MS, Steadman JR, Briggs K, Zurakowski D, Sterett WI, Hawkins RJ (2002) Determinants of patient satisfaction with outcome after anterior cruciate ligament reconstruction. J Bone Joint Surg Am 84:1560-1572
5. Spengler DM, Oullette EA, Battie M, Zeh J (1990) Elective discectomy for herniation of a lumbar disc. Additional experience with an objective method. J Bone Joint Surg Am 72:230-237
6. Straub TA (1999) Endoscopic carpal tunnel release: a prospective analysis of factors associated with unsatisfactory results. Arthroscopy 15:269-274
7. Tandon V, Campbell F, Ross ER (1999) Posterior lumbar interbody fusion. Association between disability and psychological disturbance in noncompensation patients. Spine 24:1833-1838
8. Wedderburn LR, Varsani H, Li CK, Newton KR, Amato AA, Banwell B, Bove KE, Corse AM, Emslie-Smith A, Harding B, Hoogendijk J, Lundberg IE, Marie S, Minetti C, Nennesmo I, Rushing EJ, Sewry C, Charman SC, Pilkington CA, Holton JL; UK Juvenile Dermatomyositis Research Group. International consensus on a proposed score system for muscle biopsy evaluation in patients with juvenile dermatomyositis: a tool for potential use in clinical trials. Arthritis Rheum. 2007 Oct 15;57(7):1192-201.
9. Wiltse LL, Rocchio PD (1975) Preoperative psychological tests as predictors of success of chemonucleolysis in the treatment of the low back syndrome. J Bone Joint Surg Am 57:478-483

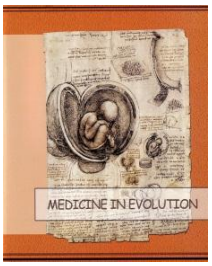
Centrele de Cercetare blend-a-med și Oral-B

Este nevoie de efort - zi de zi - pentru a îmbunătăți cu adevărat sănătatea orală a pacienților. De aceea, P&G Oral Health, cu Centrele sale de Cercetare blend-a-med și Oral-B îi susține pe medicii dentiști atât în cabinet, cât și prin extinderea influenței lor dincolo de unitul dentar. Când pacienții părăsesc cabinetul de medicină dentară, produsele și serviciile noastre sunt un sprijin pentru ei.

blend-a-med RESEARCH CENTERS Oral-B

P&G Oral Health

ASSESSMENT OF ASLAMED TOOTHPASTE FOR SENSITIVE TEETH IN MANAGING DENTIN HYPERSESTHESIA



ALEXANDRINA MUNTEAN[1], ANCA MESAROS[2], MICHAELA MESAROŞ[3], DANA FESTILA[4], ANCA MUNCEANU[5]

[1]Paediatric Dentistry Department, University of Medicine and Pharmacy "Iuliu Haţieganu"Cluj Napoca
[2] Dental Propaedeutic and Aesthetics Department, University of Medicine and Pharmacy "Iuliu Haţieganu"Cluj Napoca
[3]Paediatric Dentistry Department, University of Medicine and Pharmacy "Iuliu Haţieganu"Cluj Napoca
[4]Orthodontic Department, University of Medicine and Pharmacy "Iuliu Haţieganu"Cluj Napoca
[5]S.C. Farmec S.A. Cluj Napoca

ABSTRACT

Dentin hyperesthesia may change the individual's daily life and one way to control and improve the painful symptoms associated with this particular type of pain is the daily use of a toothpaste with desensitizing effect.

The objective of this study was to assess the effectiveness in contend with dentin hyperesthesia of Aslamed toothpaste for sensitive teeth, original formula with 5% potassium nitrate.

Material and methods. The study was carried out by means of two parallel groups who tested for 8 consecutive weeks: a desensitizing toothpaste and another toothpaste made by the same manufacturer. Dentin hyperesthesia was evaluated using individual criteria and the air blast sensitivity test. Results and discussion. In the test group the dentin sensitivity level decrease with at least one unit, with statistically significant differences.

Conclusions: The results allow us to consider Aslamed toothpaste for sensitive teeth as providing an effective control of dentin hyperesthesia.

Key words: *dentin hyperesthesia, desensitizing tooth paste*

Correspondence to:

Alexandrina Muntean
Address: Teodor Mihali Street, no. 2, sc.IV, apt.103, 400691 Cluj-Napoca, Romania
Phone: +4 0 721638054
E-mail address: ortoanda@yahoo.com

INTRODUCTION

Dentin hyperesthesia was defined as pain in response to external stimuli, from a tooth that has no other active dental pathology [1]. Dentin hyperesthesia can interfere in the daily life culminate with taking on functional behaviours designed to avoid painful crises. Modern eating habits, incorrect brushing technique, orthodontic appliances, occlusal imbalances are some of the causes that generate dentin hyperesthesia localized or generalized. One way to control the symptoms is the use of a desensitizing toothpaste as a daily dental care routine [2].

The objective of this study was to evaluate the efficiency in keep under control dentin sensitivity for a toothpaste containing potassium nitrate 5%, a Romanian original product, in line with current developments in the field.

MATERIAL AND METHOD

Parallel groups tested 2 toothpaste's for 8 consecutive weeks as follows: a toothpaste with desensitizing effect (5% potassium nitrate, clay and fluoride) and another toothpaste, made by the same manufacturer. The groups consisted of younger patients aged between 23 and 44 years who have agree to participate and have been informed about the product to be evaluated. The approval of the ethics committee of the University of Medicine and Pharmacy "Iuliu Haţieganu"Cluj Napoca was reached prior the beginning of the study. Additional criteria of choice were: absence of others dental pain, lack of general pathology necessitating chronic medication, do not use in the individual dental care program an toothpaste with desensitizing effect in the last 2 month.

Dentin hyperesthesia was evaluated by means of objective criteria with the air blast sensitivity test [3]. Examination was performed by a single examiner, in the dental office, in standard conditions. For the test, air projected from the air-water spray of the dental unit was used. For each subject were selected two teeth (T1, T2) located above the molar area assess as sensitive by the patient. Every sensitive tooth was formal isolated by placing examiner fingers mesial and distal and using spray unit 's a column of air was projected from a distance of about 1 cm for 1 second. Dentin hyperesthesia Quantification was performed with a rating scale- The Schiff Cold Air Sensitivity Scale [3] as follows:

0 –subject does not respond to air;

1 -subject responds to projected air stimulus, but does not require interruption;

2 -subject responds to air designed stimulus and require the disruption or assume an antalgic posture;

3 -subject responds to air, believes that the stimulus causing pain and calls for its withdrawal.

Patients included in the test group were obtained at least 2 score at the test sensitivity due to air. Subjects included in the control group had values of 0 and 1 at the air blast test.

The hypothesis evaluated in this study was the reduction of sensitivity due to air with at least one unit by using only the toothpaste with desensitizing effect.

RESULTS

Study group included a total of 49 subjects (38 female, 11 male) and the age range varied between 23-44 years for both groups, with no statistically significant differences (table I):

Table I. Age distribution in the study groups

	N	Mean	Std. Dev.	Std. Error	95% Confidence Interval for Mean		Min.	Max.	p
Test group	25	28,72	6,05	1,21	26,22	31,22	23	45	0,07
Control group	24	26,58	5,66	1,16	24,19	28,97	21	43	
Total	49	27,67	5,90	0,84	25,98	29,37	21	45	

In the test group dentin sensitivity values were important at the beginning of the study for both analysed teeth and evolved in a favourable manner during the follow up period (table II).

The dentin sensitivity level decrease significantly for both teeth (table III).

Table II. Dentin sensitivity values in the test group-initial and final values

Dentin sensitivity values	Tooth 1 initial (Nr.)	Tooth 1 final (Nr.)	Tooth 2 initial (Nr.)	Tooth 2 final (Nr.)
1	0	14	0	11
2	14	9	14	11
3	11	1	11	3

Table III. Dentine sensitivity evolution for evaluated teeth

	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference		p
T1init - T1fin	1,00	0,66	0,13	0,72	1,28	**0,00006**
T2init - T2fin	0,83	0,64	0,13	0,56	1,10	**0,0001**

Dentin sensitivity reduce for both teeth T1 and T2, but in different rates. For tooth T1 dentin sensitivity decreased for 56 % of subjects at an acceptable level (score 1) (table IV).

For tooth T2 dentin sensitivity decreased for 44% subjects at an acceptable level (score 1) (table V).

In the control group the level of tooth sensitivity was originally 1 or 0 for both evaluated teeth and remain constant or revealed improvement during the study (table VI).

Table IV. Dentine sensitivity evolution –T1 tooth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	14	56,0	58,3	58,3
	2	9	36,0	37,5	95,8
	3	1	4,0	4,2	100,0
	Total	24	96,0	100,0	
Missing	System	1	4,0		
Total		25	100,0		

Table V. Dentine sensitivity evolution –T2 tooth

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	44,0	45,8	45,8
	2	11	44,0	45,8	91,7
	3	2	8,0	8,3	100,0
	Total	24	96,0	100,0	
Missing	System	1	4,0		
Total		25	100,0		

Table VI. Dentine sensitivity evolution in the control group

Dentin sensitivity values	T1 initial (Nr.)	T2 initial (Nr.)	T1 final (Nr.)	T2 final (Nr.)
0	19	13	17	17
1	5	11	5	5

DISCUSSIONS

Dentinal hypersensitivity has been shown to peak in 20 to 30 year olds patients feature considered in our study as a start point for patient's selection. Many authors express an agreement that this particular dental pain is either under-reported by the patient or misdiagnosed [4]. Dentin sensitivity was found in our group with a higher incidence in the female gender, item in agreement with studies in the literature, because of women's excessive concern for aesthetics that settle on a more aggressive tooth brushing technique, used of abrasive formula of toothpaste and cosmetic dental procedure [5].

A treatment for dentin hypersensitivity must be perform in a short period of time and it should be affordable for the patient. Non-invasive treatment options are topical agents and dentifrices that contain a desensitizing active ingredient [6]. The use of a specific toothpaste has been considered one of the elementary alternatives, because tooth paste are easily available, tooth brushing represent an common habit in modern life and did not demand special features for the patient.

According to the literature, the most available desensitizing toothpaste ingredient is potassium nitrate because the potassium ions block the synapse between nerve cells, reducing nerve excitation and the associated pain [7]. A number of studies, published since the early seventies, have investigated the use of potassium nitrate as an effective active ingredient in treating dentinal hypersensitivity [8]. A four-week exposure time is widely used in clinical trials because results have shown that this time is needed for KNO3 to exert its desensitizing effect [9].

Individual subjects enrolled in our study note a significant reduction of sensitivity by using the product for 3-4 weeks, element that sustained the importance of constant application of the desensitizing toothpaste, element in line with studies from the literature [9].

Other studies demonstrate that the analgesic effect of a desensitizing toothpaste may be improved by adding additional substances of whose particles can penetrate the dentin tubules and which are stable in case of mechanical and chemical irritants. In line with this statements, authors recommended that potassium nitrate could be associated with other ingredients aimed at decreasing plaque formation and inflammation, in addition to reducing sensitivity [10].

In our evaluated product fluoride component play an important role in topical mineralisation, providing an augmentation in enamel mineral component. Fluoride effect was sustained by clay, a natural antibacterial and remineralised component, elements that's we assume acts in synergy with potassium salts in reducing dentinal hypersensitivity [11].

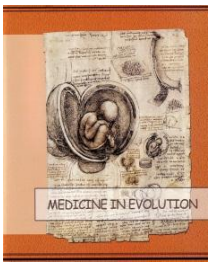
CONCLUSIONS

Dentin sensitivity reduction with statistically significant differences for evaluated tooth permit us to considered tooth paste as a therapeutically agent that can preserved the results of professional procedures applied in dental office. In addition, constant use of ASLAMED toothpaste for sensitive teeth influence in a positive manner individual discomfort and improved patient quality of life.

REFERENCES

1. Bartold PM. Dental hypersensitivity: a review. *Aust Dent J* 2006; 51(3):212-218.
2. Orchardson R, Gillam DG. Managing dentin hypersensitivity J Am Dent Assoc. 2006; Vol 137(7): 990-998.
3. Poulsen S, Errboe M, Lescay Mevil Y, Glenny AM. Potassium containing toothpastes for dentine hypersensitivity (Review).*Cochrane Database Syst Rev* 2008; 8:1-17.
4. Rees JS, Addy M. A cross-sectional study of dentine hypersensitivity. J Clin Periodontol 2002; 29:997-1003.
5. Irwin CR, McCusker P. Prevalence of dentine hypersensitivity in a general dental population. J Ir Dent Assoc 1997; 43(1):7-9.
6. Ayad F, Ayad M, Delgado E, Zhang YP, DeWizio W, Cummins D, et al. Comparing the efficacy in providing instant relief of dentin hypersensitivity of a new toothpaste containing 8.0% arginine, calcium carbonate, and 1450ppm fl uoride to a benchmark desensitizing toothpaste containing 2% potassium ion and 1450ppm fl uoride, and to a control toothpaste with 1450ppm fl uoride: A three-day clinical study in Mississauga, Canada. *J Clin Dent* 2009; 20(Spec Iss):115-122.
7. Peacock JM, Orchardson R. Action potential conduction block of nerves in vitro by potassium citrate, potassium tartrate and potassium oxalate. J Clin Periodontol 1999; 26(1):33-7.
8. Orchardson R, Gillam DG. The efficacy of potassium salts as agents for treating dentin hypersensitivity. J Orofac Pain 2000; 14(1):9-19.
9. Wara-aswapati N, Krongnawakul D, Jiraviboon D, Adulyanon S, Karimbux N, Pitiphat W. The effect of a new toothpaste containing potassium nitrate and triclosan on gingival health, plaque formation and dentine hypersensitivity. J Clin Periodontol 2005; 32(1):53-8.
10. Hu D, Zhang YP, Chaknis P, Petrone ME, Volpe AR, DeVizio W. Comparative investigation of the desensitizing efficacy of a new dentifrice containing 5.5% potassium citrate: an eight-week clinical study. J Clin Dent 2004; 15(1):6-10.
11. Yates R, Ferro R, Newcombe RG, Addy M. A comparison of a reformulated potassium citrate desensitising toothpaste with the original proprietary product. J Dent 2005; 33(1):19-25.

BONE GRAFTING FOR REPLACEMENT OF MAXILLARY LATERAL INCISOR- A CASE REPORT



CRISTIAN IRIMIA[1], KONSTANTINOS LIAROKAPIS[1]

[1]University of Medicine and Phamacy Carol Davila, Bucuresti, Romania

ABSTRACT

Insertion of endosseous implants in compromised ridges is often complicated because of lack of supporting bone. Augmentation with xenograft has been proven to be a reliable treatment modality. This work investigates the success of bovine bone grafting in reconstructing maxillae with severely bone dehiscence.

Key words: *bone graft, bovine bone, periapical*

Correspondence to:

Dr. Konstantinos Liarokapis
Address: Clinica de Chirurgie Oro-Maxilo-Facială a UMF „Carol Davila"Calea Plevnei 19 010221 Bucureşti, Romania
Phone: +4 0728752 175
E-mail address: dr.cristianirimia@gmail.com

INTRODUCTION

The characteristics of the alveolar ridge play an important decisive factor in the success of implant placement [1]. Currently, however, implants are also being placed in sites with ridge defects of various dimensions utilizing the various reconstruction techniques using bone graft, guided bone regeneration or distraction [2].

We present the surgical procedure in a case where the missing maxillary left lateral incisor was restored by placement of implant after the use of bone grafting for correction of dehiscence in the alveolar ridge.

CASE REPORT

A 27 year old male patient reported to the Department of Oro-Maxillo-Facial Surgery, UMF „Carol Davila"Bucharest, with swelling of the anterior upper jaw. The medical history revealed previous surgical procedure for appendicectomy. The dental history was free apart from routine dental procedures such as fillings and prosthetics. The clinical and radiographic examination revealed a periapical lesion of the upper left lateral incisor (Fig.1 a,b).

Figure 1a.. Pre-operative photograph (frontal view) (Photo courtesy of Prof. Dr. Alexandru Bucur)

Figure 1b. Pre-operative periapical xray (Photo courtesy of Prof. Dr. Alexandru Bucur)

It was decided to extract the tooth which was severely decayed and non restorable. The upper left incisor was extracted with the associated periapical lesion.

The patient expressed the desire to replace his missing tooth. He was systemically healthy with good periodontal condition and meets a satisfactory mouth hygiene standard. Clinical examination revealed the mucosa was firm and resilient with normal thickness.

A 2-stage procedure was performed with a 4-month healing period between graft and implant placement The implant surgical procedure was planned after bone grafting to cover dehiscence in the labial aspect.

The surgical procedure was performed according to established guidelines for implant placement.

A buccal dehiscence was noted. After decorticating the labial bone with hand instruments, the graft (particulate bovine bone graft) mixed with

hyaluronic acid barrier gel and blood from the recipient site was placed covering the dehiscence (Fig.2).

Figure 2. Dehiscence defect at the labial bone and bovine bone graft placed to cover the defect (Photo courtesy of Prof. Dr. Alexandru Bucur)

The flap was closed over the graft sutured using interrupted sutures.

An immediate postoperative xray of the surgical site showed the position of the graft.

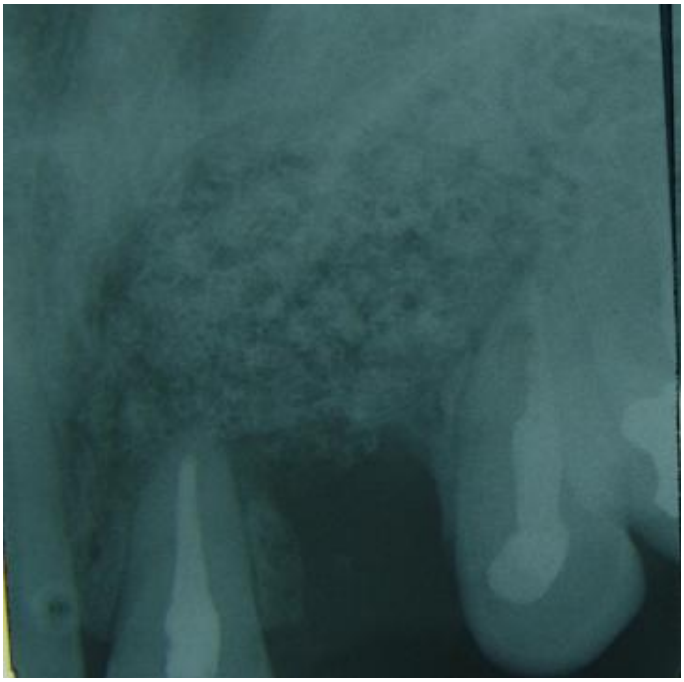


Figure 3. Post-operative radiograph (Photo courtesy of Prof. Dr. Alexandru Bucur)

After the healing period of the bone grafts, no local pathology was observed.

DISCUSSIONS

Dehiscence defects following periapical cyst removal may range from a small lack of marginal bone to large areas. If the jaws contain defects of such a magnitude that the implants cannot be placed in proper position without having major parts of the bone exposed, a ridge augmentation is often done using bone grafting [3].

Various technique including guided bone regeneration and bone grafting are being employed to assist implantation at the dehiscence sites.

Here a grafting with particulate bovine bone graft [4], was performed to cover the

defect and to level the deformity in the labial bone.

Evaluation of bovine bone as grafting mass in implant sites have shown that graft material enhanced bone formation in the augmented sites [5,6].

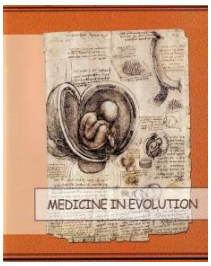
CONCLUSIONS

Appropriate use of reconstruction techniques using bone graf will enable the successful treatment of almost any complicated case with bone deficient jaws.

In this case we performed bone replacement graft using bovine bone for the correction of dehiscence in the alveolar ridge. We conclude that bone grafting with bovine bone is a reliable treatment modality.

REFERENCES

1. Misch CE, Dietsh F.Bone-grafting materials in implant dentistry.Implant Dent. 1993 Fall;2(3):158-67.
2. Block MS, Baughman DG: Reconstruction of severe anterior maxillary defects using distraction osteogenesis, bone grafts and implants. Journal of Oral and Maxillofacial Surgery, 2005;63(3):291-297
3. Jensen, S. S., Broggini, N., Hjørting-Hansen, E., Schenk, R., Buser, D. (2006) Bone healing and graft resorption of autograft, anorganic bovine bone and β-tricalcium phosphate. A histologic and histomorphometric study in the mandibles of minipigs. Clin. Oral Implant Res. 17, 237–243
4. Zitzmann NU, Scharer P, Marinello CP, Schupbach P, Berglundh T. Alveolar ridge augmentation with Bio-Oss: a histologic study in humans. Int J Periodontics Restorative Dent 2001; 21: 288-295.
5. Mellonig JT. Human histologic evaluation of a bovine-derived bone xenograft in the treatment of periodontal osseous defects. Int J Periodontics Restorative Dent 2000; 20: 19-29.
6. Hämmerle, C. H. F., Chiantella, G. C., Karring, T., Lang, N. P. (1998) The effect of a deproteinized bovine bone minerals on bone regeneration around dental implants. Clin. Oral Implant Res. 9, 151–162.



INCIDENCE AND PATTERNS OF SQUAMOUS CELL CARCINOMA IN THE SOFT TISSUE OF ORAL AND PERIORAL REGION – RETROSPECTIVE STUDY

ADRIAN NICOARĂ[1], LILIANA VASILE[2], FELICIA STREIAN[1],DOINA CHIORAN[1], ANCA TUDOR[3], EMILIA IANEŞ[1]

[1]Department of Oral and Maxillofacial Surgery, University of Medicine and Pharmacy "Victor Babeş" Timişoara, Romania
[2]Department of Histopathology and Cytology, University of Medicine and Pharmacy "Victor Babeş" Timişoara, Romania
[3]Department of Medical Informatics, University of Medicine and Pharmacy "Victor Babeş" Timişoara, Romania

ABSTRACT

Aim and objectives: *To determine the frequency and pattern of squamous cell carcinoma (SCC) in oral and perioral soft tissue tumoral lesions with an emphasis on site and histological type of lesions.*

Materials and methods: *We performed a descriptive, retrospective study on 1355 patients with oral and perioral soft tissue tumoral lesions admitted into the Oral and Maxillofacial Surgery Clinic of Timisoara between 2008 and 2010. This data was correlated with the histopathological findings for all benign and malignant tumors.*

Results: *Out of 1355 patients, 42.1% presented tumors of malignant nature. The most common malignant tumor was the squamous cell carcinoma found in 334 patients (56%). The age range of the patients with squamous cell carcinoma included in our study was between 4 and 94 years with a mean age of 64.08 ±12.80. The distribution of the subjects was: 87 female patients (26%) with a mean age of 69.97±14.72 and 247 male patients (74%) with a mean age of 61.91±11.30, 137 patients (41%) from urban areas (62.66±12.49) and 197 patients (59%) from rural areas (64.95±12.89). The most common site of SCC was the tongue (21.9%), lip (19.5%), perioral skin (19.2%) and the lowest incidence was in the palate (2.1%). The histological grading of SCC was: well differentiated in 21.6%, moderately differentiated in 224 patients (67.1%) and poorly differentiated in 10.2%.*

Conclusions*: In our study, squamous cell carcinoma was the most common tumoral lesion in the oral and perioral region, with the tongue, lip and the skin being the most common sites, while the palate was the least affected. The incidence of SCC in males was higher than in females, with a much lower mean age at the first visit.*

Key words: *oral and perioral region, descriptive study, squamous cell carcinoma*

Correspondence to:

Adrian Nicoară
Address: str. Albinelor 55A, Timişoara, 300244
Phone: +4 0723969298
E-mail address: adinicoara@gmail.com

INTRODUCTION

Soft tissue tumors account for less than 1% of all tumors, the annual incidence of soft tissue tumors being approximately 300 per 100,000 people in the general population. The benign lesions exceed the malignant ones by roughly 100 times, frequently involving the head and neck region.[1]

The incidence rates for oral cancer vary in men from 1 to 10 cases per 100,000 in many countries, but a sharp increase in the incidence rates of oral and pharyngeal cancers have been recorded in several countries and regions, Central and Eastern Europe included.[2] The scientific data shows that the incidence of neoplastic lesions in the maxillofacial region is quite high, the squamous cell carcinoma being rated sixth worldwide.[3] Because of these similarities of soft tissue tumors in the oral and perioral regions, information on incidence and patterns of specific histological types of tumors is required.

We carried out a study on benign and malignant tumoral soft tissue lesions in the oral and perioral regions in patients who were treated in The Clinic of Oral and Maxillofacial Surgery of Timişoara. The aim of this study was to determine the frequency and pattern of squamous cell carcinoma in oral and perioral soft tissue tumoral lesions with an emphasis on the site and histological type of lesions.

MATERIAL AND METHOD

We performed a descriptive, retrospective cross-sectional study on patients with oral and perioral soft tissue tumoral lesions admitted into the Oral and Maxillofacial Surgery Clinic of Timisoara between 2008 and 2010. The study included a total of 1355 patients aged between 1 and 95 years, males and females, from rural and urban areas. In our study we analyzed data from the patients' medical records and histopathological findings. From the hospital database we extracted data on all patients registered between January 2008 and December 2010 with tumoral lesions of the soft tissue in the oral and perioral regions. This data was correlated with the histopathological findings for all benign and malignant tumors. A report was made that included the following parameters for each patient: gender, age, social background, tumor location, histopathological diagnosis.

The patients had incisional or excisional biopsy performed in the Oral and Maxillofacial Surgery Clinic of Timişoara. The diagnoses were confirmed by the histological exam of the specimens in the Laboratory of Pathology - Municipal Hospital of Timisoara.

RESULTS

In the 3 year period, 1355 patients with oral or perioral soft tissue lesions were admitted in our clinic, 541 patients in 2008, 393 in 2009 and 421 in 2010. The age range of the patients included in our study was between 1 and 95 years, with a mean age of 56.43 ±19.46. Genderwise, the distribution of patients was 716 male patients (52.8%) and 639 female patients (47.2%). The mean age of the males (55.1±18.8) was found to be slightly lower than that of females (57.8±20.0), 70.7% of the study subjects being over 50 years of age. (Table 1)

The distribution of patients on the clinical and histopathological exam of the tumoral lesions was: 597 of a

malignant nature (44.05%) and 758 of a benign nature (55.95%).

Table 1. Patients with SCC distribution on gender and social background

	Female	Male	Total
Urban	21	103	134
Rural	54	139	193
Total	85	242	327

The statistical analysis of the 597 patients (mean age of 65.53±14.04) with malignant lesional tumors of the soft tissue in oral and perioral regions, revealed that 362 (60.6%) patients were males, compared to 235(39.4%) female patients. The average age of the 362 male patients (62.69±13.28) was significantly lower than that of the 235 female patients (69.91±14.09). The distribution of patients with malignant tumoral lesions on social background revealed that 264 patients (44.2%) were from urban areas with an average age of 65.39±14 and 333 patients from rural areas (55.8%) with an almost identical average age of 65.64±14.09. As for the location of the malignant lesions, 229 patients (38.4%) developed tumors of the skin demonstrating the highest incidence, followed by 84 in the lip (14.1%), 74 in the tongue (12.1%), 41 in the floor of the mouth (6.9%), 37 in the oral mucosa (6.2%) (17 in gingival mucosa 2.8%), 31 in the salivary glands (5.2%) (21 in parotid glands), 30 in lymph nodes (5%), 29 in connective tissue (4.9%), 13 in the palate (2.2%), and 29 other localizations.

In our study, the histological types of the malignant tumoral lesions of soft tissue in oral and perioral regions were: 334 patients with squamous cell carcinoma (SSC) (56%), 190 patients with basal cell carcinoma (BCC) (31.9%), 12 with malignant melanoma (2%), 10 with lymphomas (1.7%), 9 with mucoepidermoid carcinoma (1.5%), 7 with adenocarcinoma (1.2%), 5 with adenoid cystic carcinoma (0.8%), 4 with anaplastic carcinoma (0.7%), 5 with malignant pleomorphic adenoma (0.8%), 2 with sebaceous carcinoma (0.3%), and 2 with small-blue-round-cell carcinoma (0.3%), 2 with mioepitelioma (0.3%), 2 with malignant fibrous histiocytoma (0.3%) and one with Merkel cell carcinoma, one accinar cell carcinoma, one metatypic carcinoma, one pleomorphic sarcoma, one chondrosarcoma, one papillary thyroid carcinoma, one multiple myeloma and one hemangiopericytoma. **(Table 2)**

The number of patients with SCC on each year of our study was: 136 patients in 2008, 93 patients in 2009 and 105 patients in 2010. In the 3 year period, 87 patients were female (26%) with a mean age of 69.97±14.71 years and 247 patients were males (74%) with a mean age of 61.91±11.30 years while the overall mean age was 64.08±12.80 years. The distribution of patients with SCC on social background was: 137 patients (41%) from urban areas (62.66±12.49) and 197 patients (59%) from rural areas (64.95±12.89).

As for the location of the SCC, the distribution of cases was: 73 in the tongue (21.9%) (mean age 59.05±10.83) with the highest incidence, 65 patients (19.5%) developed tumors of the lip (mean age 69.26±9.79), 64 in the skin (19.2%) (mean age 71.64±11.13), 40 in the floor of the mouth (12%) (mean age 58.88±10.13), 29 in the oral mucosa (8.7%) (61.25±11.23) (12 patients with SCC in gingival mucosa (3.7%), 11 in the salivary glands (3.3%) (72.27±11.59), 19 in lymph nodes (5.7%) (56.74±12.77), 11 in connective tissue (3.3%) (60.27±9.11) and 7 in the palate (2.1%) (58.71±13.16). **(Table 3)** When we applied the unpaired t-test for the

data in table 3 we found that the age for female patients is significantly higher in SCC of the skin (with 0.01 level of significance) and for the SCC of the oral floor (with 0.05 level of significance).

In our study, the histological subtypes of SCC found were: well differentiated squamous cell carcinoma in 72 patients (21.6%) (mean age 62.06±15.64), moderately differentiated in 224 patients (67.1%) (mean age 63.83±11.69), poorly differentiated squamous cell carcinoma in 34 patients (10.2%)(mean age 69.32±12.26), 2 cases of verrucous carcinoma and anaplastic SCC in 2 patients.(Table 4)

Table 2. Histological types of malignant tumoral lesions of oral and perioral region

SSC	334	56%
BCC	190	31.9%
malignant melanoma	12	2.0%
lymphomas	10	1.7%
mucoepidermoid car.	9	1.5%
adenocarcinoma	7	1.2%
other	35	5.7%
Total	597	100%

Table 3. Location of SCC and mean age for each gender

	Male		Female		Total		p^{sign}
Tongue	63	58.68±9.85	10	61.40±16.18	73	59.12±10.89	0.464^{ns}
Lip	48	68.52±10.26	17	71.35±8.25	65	69.26±9.79	0.310^{ns}
Skin	32	67.44±10.01	32	75.84±10.64	64	71.64±11.13	0.002^{s}
Oral Floor	34	57.26±8.23	6	68±15.36	40	58.88±10.13	0.015^{s}
Oral mucosa	22	58.55±9.39	7	65.83±12.7	29	61.25±11.23	0.112^{ns}
Palate	7	13.16	0		7	58.71±13.16	-
Salivary Glands	6	72.50±8.87	5	72±15.41	11	72.27±11.59	0.948^{ns}
Lymph nodes	11	55.39±11.66	1		19	56.74±12.77	-
Connective tisssue	7	57.43±7.09	4	65.25±11.15	11	60.27±9.11	0.183^{ns}
"in situ" carcinoma	8	58.38±19.47	4	48.25±37.19	12	55±25.36	0.540^{ns}

Legend:
ns – insignificant difference
s – significant difference

Table 4. Histopathological grading of oral

Tumor Grading	**Incidence**	**Mean age**
Well differentiate	72	62.06±15.64
Moderately differentiated	224	63.83±11.69
Poorly differentiated	34	69.32±12.26
Total	**330**	**64.08±12.8**

DISCUSSIONS

In our 3 year retrospective study we found a number of 597 malignant tumoral lesions, representing 44.05% of all tumoral lesions of the oral and perioral soft tissue tumors.

The scientific data shows that the incidence of neoplastic lesions of the maxillofacial region is quite high, with the squamous cell carcinoma being rated the sixth worldwide. It is generally accepted that squamous cell carcinoma is one of the most common neoplastic lesions of the head and neck. The incidence of head and neck carcinomas varies greatly between different regions of the world [3] and

also varies in different regions of the same country.[4] Even within the same country and region, the incidence of primary tumor location varies over time.[5] The incidence of cancer in the oral and maxillofacial region is higher in older patients because several studies concluded that the risk of developing cancer of the oral cavity and perioral region increases with age by aggregating the harmful effects of carcinogens. Currently all researchers agree with the idea that chronic exposure to carcinogens can lead to genetic abnormalities in cells of oral mucosa, characterized by activation of proto-oncogenes and inactivation of tumor suppressor genes [3].

The histology of malignant tumors in our study revealed that the most common type of cancer was squamous cell carcinoma with 56% of all malignancies, followed by basal cell carcinoma (31.9%), malignant melanoma (2%), and other malignancies such as lymphomas, adenoid carcinoma, and mucoepidermoid carcinoma in a smaller proportion. The patients with SCC in oral and perioral soft tissue included in our study had a mean age of 64.08±12.80.

Haq et al reports in his study on frequencies and patterns of oral and maxillofacial carcinomas that the most common type was the Squamous cell carcinoma (84.3%) and the least frequent types of carcinoma were basal cell carcinoma and verrucous carcinoma.[4]

Another study in our country on *Squamous cell carcinoma of the oral cavity: Clinical and pathological aspects*, reported a very high percentage of squamous cell carcinoma of 92% with the well-differentiated squamous cell carcinoma grading found in 53.05% cases, 31.30% moderately differentiated and poorly differentiated squamous cell carcinoma in 15.65% of studied patients with oral cancer. [3]

Other authors assert that squamous cell carcinoma represents 90% of oral and maxillofacial malignant tumors, often aggressive and usually spreading by direct invasion of the surrounding tissues and through lymphatic channels. SCC may occur anywhere in the oral cavity region, including the hard palate, tongue, floor of the mouth, salivary glands, gingivobuccal and buccomasseteric regions, and can extend into the underlying mandible or maxilla. [6]

Our data is comparable with other studies that have shown that oral cavity squamous cell carcinoma is the most important and frequent malignant neoplasm, but we reported a lower incidence in the oral and perioral region. This difference may be explained by the fact that in our study we focused on the tumor of the oral mucosa and also the tegument and the soft tissue of the perioral region. Regarding the grading in our study, the incidence of moderately-differentiated squamous cell carcinoma in our study was very high (67.1%) compared with the other two types of tumoral grading and also compared with the findings of other authors. Various studies concluded that, the higher the tumoral grading and poorer its differentiation the higher chances of metastasis. Haq et al reported a value of 39% poorly differentiated Squamous cell carcinomas [4], while Fronie et al reported 53% of well-differentiated squamous and 31% of moderately differentiated squamous cell carcinoma.[3]. In our study, the mean age for well differentiated SCC was the lowest (62.06±15.64) while for the poorly differentiated SCC it was the highest (69.32 ±12.26), significantly higher than the age for moderately differentiated (unpaired t-test, $p=0.012$, $\alpha=0.05$) and for well differentiated (unpaired t-test, $p=0.019$, $\alpha=0.05$) while the age of well vs. moderately differentiated was insignificantly higher (unpaired t-test, $p=0.307$, $\alpha=0.05$).

For malignant tumors, the male to female ratio in our study was 1.54:1, while for SCC the ratio was 2.84:1. The male to female ratio for malignant tumors varies widely in scholarly literature between 1.3:1 and 3.27:1, while Howell et al.16 found that the ratio of female patients was increasing over time, this tendency being confirmed also by Ariyoshi Y et Al with a male to female ratio of 1.45:1. The higher proportion of female patients with malignant tumors was linked to the slight increase in the smoking rate, while the smoking rate in males has decreased. [3]

In our study, the average age for male patients with SCC is lower than that of female patients by approximately 7 years. The incidence of SCC in patients from rural areas is higher than in those of urban origin but the mean age is equal. The incidence of oral cancer by primary location varies depending on the geographic region. Some reports have noted the tongue as the primary site, while others note the lip and buccal mucosa. Tarvainen et al. reported that the incidence of lip cancer in males had declined recently, and cited decreases in the smoking rate and in the number of outdoor workers as contributing factors.[5]

Regarding the site of SCC, we found that the tongue was the most common (21.9%), followed by the lip (19.5%) and the skin (19.2%), and the lowest incidence of SCC was in the palate (2.1%). Our results are almost the same as those of Midion et al. and Haq et al. [4] related to the incidence of cancers in the oral cavity, with oral mucosa, lip and tongue as the sites with the highest incidence of cancer and the palate with the lowest.

The scholarly literature reports that cancer of the lip tends to occur more frequently in males, while the female to male ratio is higher in the cancer of the gingiva and salivary glands. In our study the male to female ratio of malignant tumors is higher in all sites except in the cancer of the salivary glands were the incidence is equal. Llewellyn et al. reported that the risk factors for oral cancer in patients aged 45 years or younger were smoking that started at a young age (16 years or younger) and excessive alcohol intake, especially for males, while the risk factors for females were reported to be hereditary predisposition, virus infection and sexual activity.[5]

In our survey the mean age for malignant cancer in men was overall lower than in females and also on almost all specific locations. The age for female patients is significantly higher in the SCC of the skin (67.44 to 75.84) (with 0.01 level of significance) and for the SCC of the oral floor (57.26 to 68) (with 0.05 level of significance). For connective tissue SCC, the difference in mean age may be explained by the small number of patients with connective tissue malignant tumors of just 11. The mean age for "in situ" carcinoma was significantly lower in female while for salivary gland SCC the mean age was equal for both genders. This data may be questionable because of the small number of patients with these specific pathologies.

CONCLUSION

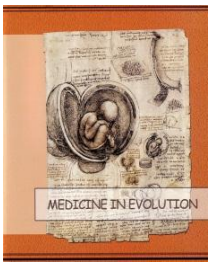
In our study, squamous cell carcinoma was the most common tumoral lesion in the oral and perioral region, with the tongue, lip and the skin being the most common sites while the palate was the least affected. The incidence of SCC in males was significantly higher than in females with a much lower age at the first visit. The squamous cell carcinoma affects more men and at a much younger age in almost all sites.

AKNOWLEDGEMENT: This paper is supported by the Sectorial

Operational Programme Human Resources Development (SOP HRD) 2007-2013, financed from the European Social Fund and by the Romanian Government under the contract number POSDRU/107/1.5/S/82839

REFERENCES

1. Razek AA, Huang BY. Soft tissue tumors of the head and neck: imaging-based review of the WHO classification. Radiographics 2011;31:1923–1954.
2. Petersen PE, Oral cancer prevention and control – The approach of the World Health Organization, Oral Oncol (2008),doi:10.1016/j.oraloncology.2008.05.023
3. 3. Fronie A, Bunget A., Afrem E., Preoțescu L, Puscu D., Sterba L.,Mogoanta L., Dumitrescu D, Squamous cell carcinoma of the oral cavity: clinical and pathological aspects, Rom J Morphol Embryol 2013, 54(2):343–348
4. Haq M, Hanif MK, Earrich RA, Mahmood HS, Saddique K, Frequency and Pattern of Oral and Maxillo-facial Carcinomas. Annals 2009; 15:171-75
5. Ariyoshi Y, Shimahara M, Omura K, Yamamoto E, Mizuki H, Chiba H, Imai Y, Fujita S, Shinohara M, Seto K; Epidemiological study of malignant tumors in the oral and maxillofacial region: survey of member institutions of the Japanese Society of Oral and Maxillofacial Surgeons, 2002. Int J Clin Oncol. 2008 Jun; 13(3): 220-8.
6. Cavalcanti MGP, Ruprecht A, Quets J. Progression of squamous cell carcinoma evaluated using computer graphics of spiral computed tomography. Dentomaxillofac Radiol 1999;28(3):145-51
7. Shahsavari F, Khourkiaee S, Ghasemi M, Epidemiologic Study of Benign Soft Tissue Tumors of Oral Cavity in an Iranian Population, Journal of Dentomaxillofacial Radiology, Pathology and Surgery; FALL 2012; 1(1);10-14.



MANAGEMENT OF PREVENTIVE AND INTERCEPTIVE ORTHODONTIC METHODS IN THE TREATMENT OF POSTERIOR CROSSBITE

DANA CRISTINA BRATU[1], RALUCA BĂLAN[1], SILVIA POP[2], YANA IVANOVA[3], ROMINA BIȚĂ[4], GEORGE POPA[5]

[1]Department of Pedodontics and Orthodontics, Faculty of Dental Medicine, "Victor Babeș"University of Medicine and Pharmacy Timișoara
[2]Department of Pedodontics and Orthodontics, Faculty of Dental Medicine, University of Medicine and Pharmacy Târgu Mureș
[3]Department of Oral and Maxillofacial Surgery, Faculty of Dental Medicine, "Victor Babeș"University of Medicine and Pharmacy Timișoara
[4]Department of Oral and Maxillofacial Radiology and Radiodiagnostic, Faculty of Dental Medicine, "Victor Babeș"University of Medicine and Pharmacy Timișoara
[5]Department of Dental Prostheses Technology, Faculty of Dental Medicine, "Victor Babeș"University of Medicine and Pharmacy Timișoara

ABSTRACT

Aim and objectives: *The purpose of this study is to assess the need for prevention and early intervention in patients with posterior crossbite. The treatment strategies discussed are: selective grinding, slow maxillary expansion and rapid maxillary expansion.*

Material and methods: *Three groups of patients, aged 3 to 11 years, diagnosed with transverse dental arch discrepancies, were treated using different therapeutic methods: selective grinding, slow maxillary expansion (SME) and rapid maxillary expansion (RME). The pre and post-expansion measurements of the intermolar and intercanine widths were done on virtual study models, using the open-source software MeshLab 1.3.2. The study models were scanned using the optical 3D scanner Activity 101 (Smart Optics Sensortechnik, Germany).*

Results: *Occlusal grinding in the primary dentition was shown to be effective in preventing posterior crossbite in the primary dentition from being perpetuated to the mixed and permanent dentitions. After SME, the intermolar width increased with 3.3-5.8 mm and the intercanine width increased with 1.3-3.9 mm. RME increased the intermolar width by 5.2-6.7 mm and the intercanine width by 3–4 mm, allowing the correction of the bilateral crossbite in 100% of the cases.*

Conclusions: *The treatment strategies involving slow and rapid maxillary expansion are effective in early mixed dentition with a high success rate. The results obtained with the various therapies are sustained by reports in the current literature. There is no scientific evidence available that shows which of the treatment options: selective grinding, SME or RME is most effective for early correction of posterior crossbite.*

Key words: *crossbite, interception, selective grinding, slow maxillary expansion, rapid maxillary expansion*

Correspondence to:

Dr. George Popa
DMD, PhD Student
Address: Department of Dental Prostheses Technology, Faculty of Dental Medicine, "Victor Babeș"University of Medicine and Pharmacy Timișoara, 9 Revoluției 1989 Avenue, 300041, Timișoara, România
Phone: +4 0741031456
E-mail address: georgepopa86@yahoo.com

INTRODUCTION

Ackermann and Proffit [1] defined preventive orthodontics as the prevention of potential interference with occlusal development. The same authors [1] defined interceptive orthodontics as "elimination of existing interferences with the key factors involved in the development of the dentition".

Another definition used in the literature is: "interceptive orthodontics is the art and science of orthodontists employed to recognize and eliminate potential irregularities and malpositions of the developing dentofacial complex"[2]. Many of the procedures are the same or common in preventive and interceptive orthodontics, but the timing is different. Ackermann and Proffit [1] considered that often, there is no clear demarcation between a potential interference and an existing interference.

In the present study we will address the need for prevention and early intervention in patients with posterior crossbite.

The definition in the American Association of Orthodontists Glossary for crossbite is: "an abnormal relationship of a tooth or teeth to the opposing teeth, in which normal buccolingual or labiolingual relationships are reversed". In our cases we applied the definition as any abnormal buccolingual relationship between opposing molars, premolars, or both, in centric occlusion.

Posterior crossbite is one of the most prevalent anomaly in the primary and early mixed dentition and it is reported to occur between 7 and 23% of the cases [3]. The prevalence of posterior crossbite in the deciduous dentition varies between 8 and 16%, with predominance for unilateral crossbite, associated with a functional shift of the mandible towards the crossbite side (in 80-97% of the cases).

A conventional classification for the posterior crossbite is:

- crossbite that may involve a single tooth or multiple teeth;
- unilateral crossbite – true maxillary arch constriction;
- functional crossbite;
- bilateral crossbite.

Because spontaneous correction is rare, posterior crossbite is believed to be transferred from the primary to the permanent dentition, with long-term effects on the growth and development of the stomatognathic system [4, 5].

AIM AND OBJECTIVES

The purpose of this study is to assess the need for prevention and early intervention in patients with posterior crossbite. The treatment strategies discussed are: selective grinding, slow maxillary expansion and rapid maxillary expansion.

MATERIAL AND METHOD

The present study was conducted on 45 patients diagnosed with transverse dental arch discrepancies, in the Department of Pedodontics and Orthodontics, at the Faculty of Dental Medicine, "Victor Babeş"University of Medicine and Pharmacy Timişoara.

The patients, aged 3 to 11 years, were divided into three groups (Group I, II and III), according to their age and to the clinical aspects of the transverse dental arch discrepancies.

A different therapeutic approach was used for each group, in accordance to the severity of the anomalies.

Group I consisted of 20 patients, 3-5 years of age, diagnosed with functional posterior crossbite and mandibular lateral shift. In order to correct the functional or "forced"posterior crossbite, the

selective grinding therapy was the treatment of choice.

For each patient, frontal and lateral view intraoral photographs were taken in maximum habitual intercuspidation position (MHI), which clearly showed the mandibular deviation (Figure 1). Another set of photographs were taken in centric relation (CR), after the mandible was guided into the correct position, using the single-handed technique (Figure 2).

When in CR, patients no longer presented posterior crossbite, but rather premature occlusal contacts, therefore they were classified as having functional posterior crossbite.

Figure 1. Functional posterior crossbite: frontal view of the occlusion in MHI, showing the mandibular deviation

Figure 2. Functional posterior crossbite: lateral view of the occlusion in CR

Premature contacts were clinically identified and marked with articulating paper in centric relation for each patient. Occlusal adjustments by selective grinding were made at the points of observed premature contacts.

The grinding technique facilitates the sliding of the cusps buccally in the maxilla and lingually in the mandible. The premature contacts were most pronounced for the primary canines. The selective grinding, at an angle of 45° to the long axis of the teeth, produced inclined planes that allowed the mandible to assume a correct position. Because the neuromuscular pattern for lateral guiding of the mandible could still persist, the patients were advised to self-train in front of the mirror and to learn how to guide the mandibular midline into alignment with the maxillary midline.

Orthodontic appliances were used in the early mixed dentition, when the selective grinding therapy was not sufficient to correct the functional posterior crossbite.

Group II consisted of 20 patients, 6-8 years of age, diagnosed with unilateral crossbite, oral respiration, low tongue position and tongue thrusting (Figure 3). The chosen therapy was the slow maxillary expansion (SME), using Quad-Helix appliances (Figure 4).

Figure 3. Unilateral crossbite: lateral view of the occlusion in MHI

Figure 4. Quad-Helix appliance

The active treatment period varied between 4 and 6 months and was followed by a retention phase of 4 months.

Group III consisted of 10 patients, 9-11 years of age, diagnosed with bilateral crossbite and no midline deviation (Figure 5). The chosen therapy was the rapid maxillary expansion (RME) using the two-arm maxillary expander (Veltri N, 2001). The active treatment period was 12 days, with an activation rate of the screw of three activations per day. The opening of the midpalatal suture was evaluated both clinically and radiographically.

Figure 5. Bilateral crossbite: lateral view (right and left side) of the occlusion in MHI, before RME

Both in Group II and Group III, the correction of the posterior crossbite was followed by the use of removable or fixed orthodontic appliances, as part of the comprehensive orthodontic treatment, undertaken to correct the rest of the associated anomalies.

The pre and post-expansion measurements of the intermolar and intercanine widths were done on virtual study models, using the open-source software MeshLab 1.3.2. The study models were scanned using the optical 3D scanner Activity 101 (Smart Optics Sensortechnik, Germany).

The intermolar width was measured as the distance between the distobuccal cusps of the permanent maxillary first molars. The intercanine width was measured as the distance between the cusps of the temporary and/or permanent maxillary canines (Figure 6).

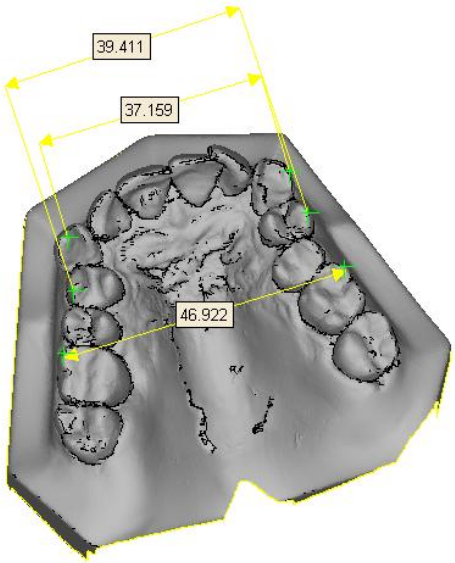


Figure 6. The measurement of the intermolar and intercanine width on the virtual study model

RESULTS

In Group I, the functional posterior crossbite was corrected in 60% of the cases, using the selective grinding technique. The rest of the cases were successfully treated using orthodontic appliances in the early mixed dentition.

In Group II, the unilateral skeletal crossbite was corrected in 100% of the cases using Quad-Helix appliances (Figure 7). After SME, the intermolar width increased with 3.3-5.8 mm and the intercanine width increased with 1.3-3.9 mm.

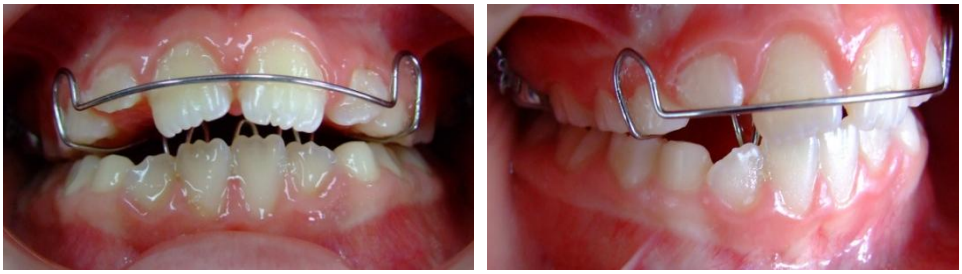


Figure 7. Unilateral crossbite: frontal and lateral view of the occlusion, after SME

In Group III, the RME therapy (dento-skeletal expansion) increased the intermolar width by 5.2-6.7 mm and the intercanine width by 3–4 mm, allowing the correction of the bilateral crossbite in 100% of the cases (Figure 8).

The opening of the midpalatal suture was observed clinically and on occlusal radiographs (Figure 9).

Figure 8. Bilateral crossbite: lateral view (right and left side) of the occlusion in MHI, after RME

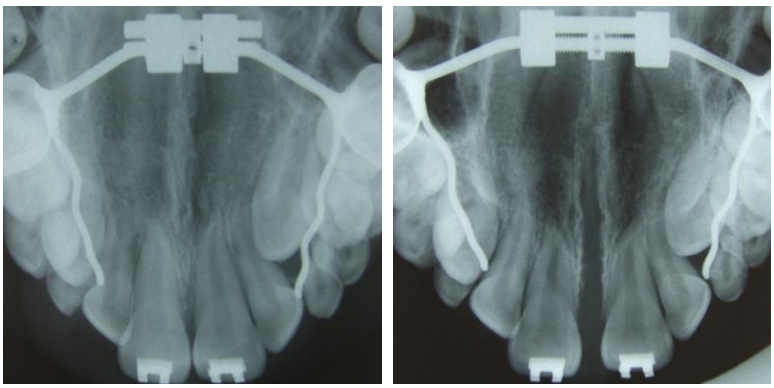


Figure 9. Occlusal radiographs before RME (left) and after RME (right), showing the opening of the midpalatal suture

Both in Group II and Group III, as part of the comprehensive orthodontic treatment, an optimal functional occlusion was established using removable or fixed orthodontic appliances (Figure 10, 11 and 12).

Figure 10. Intermediary treatment phase, after RME

Figure 11. Frontal view of the occlusion at the end of the orthodontic treatment

Figure 12. Lateral view (right and left side) of the occlusion at the end of the orthodontic treatment

DISCUSSIONS

Thilander, Vahlund and Lennartsson [6] stated that the removal of premature contacts of the primary teeth is effective in preventing a posterior crossbite from being perpetuated in the mixed and permanent dentition. When selective grinding alone is not effective, the use

of other orthodontic appliances for expansion will decrease the risk of a posterior crossbite to occur in the permanent dentition.

In the literature it has often been stated that posterior crossbite should be treated „as early as possible".

Beginning the orthodontic treatment as early as possible seems a pertinent therapeutic approach because it enables the complete or partial correction of many incipient anomalies or a reduction in their potential to worsen with age.

The rationale for early interceptive treatment is:

- if left untreated, the discrepancies can cause changes in the growth process and/or dental compensations;
- the discrepancies may eventually cause permanent mandibular lateral deviations and consecutively, craniofacial asymmetries.

The principle of sutural expansion through the application of orthopedic forces represents a method of inducing skeletal changes in subjects with a transverse skeletal-palatal deficiency. The slow and rapid palatal expansion demonstrated significant dento-skeletal changes in all planes with the most remarkable changes occurring in the transverse plane [7].

As emphasized by Graber [8], to avoid future skeletal asymmetries, it should be remembered that the early correction of posterior crossbite is of major importance.

The rapid palatal expansion demonstrated significant dental and skeletal changes in all planes with the most remarkable changes occurring in the transverse plane.

A posterior crossbite may also be a potential factor in the development of condylar asymmetries. The condyle is one of the most sensitive structures to occlusal changes [9] and it is generally affected by transverse anomalies in growing individuals [10]. The condyle on the crossbite side is positioned relatively more superiorly and posteriorly in the glenoid fossa than that on the non-crossbite side [11].

Altered muscle function, associated with posterior crossbite can reduce the bite force in mixed dentition. According to EMG analysis, children with posterior crossbite have asymmetrical muscle function during chewing or clenching. Subsequent neuromuscular adaptation to the acquired mandibular position can cause asymmetric mandibular growth, facial disharmony and several functional changes in the masticatory muscles and temporomandibular joint [12, 13].

CONCLUSIONS

1. Preventive and interceptive orthodontics can potentially eliminate the need for treatment in the later dentition stages and can reduce the cost for future extensive orthodontic treatment.
2. In those patients who did not respond to the selective grinding therapy, the addition of another orthodontic appliance was shown to be effective in preventing a posterior crossbite in the primary dentition from being perpetuated to the mixed and permanent dentitions.
3. The treatment strategies involving Quad-Helix therapy and rapid maxillary expansion are effective in the early mixed dentition with a high success rate.
4. Both slow and rapid maxillary expansion techniques are clinically capable of expanding the maxilla and correcting the posterior crossbite.
5. There is no scientific evidence available that shows which of the treatment options: selective grinding, slow or rapid maxillary

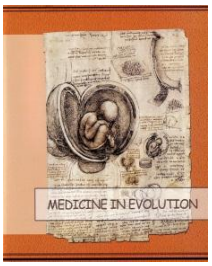
expansion is most effective for early correction of posterior crossbite.

6. Beginning the treatment of the posterior crossbite as early as possible is advisable because the growth in the transverse dimensions slows earlier, in comparison to the sagittal and vertical dimensions.

REFERENCES

1. Ackerman JL, Proffit WR. Preventive and interceptive orthodontics: a strong theory proves weak in practice. Angle Orthod. 1980 April;50(2):75-87.
2. Karaiskos N, Wiltshire WA, Odlum O, Brothwell D, Hassard TH. Preventive and interceptive orthodontics treatment needs of an inner-city group of 6 and 9 year old Canadian children. J Can Dent Assoc. 2005 Oct;71(9):649.
3. Kerosuo H. The role of prevention and simple interceptive measures in reducing the need for orthodontic treatment. Med Princ Pract. 2002;11:16-21.
4. Proffit WR. Contemporary Orthodontics. 3rd ed. St. Louis: Mosby; 2000. Section VI, Treatment of orthodontic problems in preadolescent children; p.435-439.
5. McNamara JA Jr. Early intervention in the transverse dimension: Is it worth the effort? Am J Orthod Dentofacial Orthop. 2002;121:572-574.
6. Thailander B, Wahlund S, Lennartsson B. The effect of early interceptive treatment in children with posterior cross-bite. Eur J Orthod. 1984;6:25-34.
7. Bratu DC, Bratu EA, Popa G, Luca M, Bălan R, Ogodescu A. Skeletal and dentoalveolar changes in the maxillary bone morphology using two-arm maxillary expander. Rom J Morphol Embryol. 2012;53(1):35-40.
8. Graber M, Vanarsdall RL. Orthodontics: Current Principles and Techniques. 4th ed. St. Louis: Elsevier Mosby; 2005; p.860-862.
9. Pirttiniemi P, Kantomaa T, Tuominen M. Effect of reduced articular function on deposition of type I and type II collagens in the mandibular condylar cartilage of the rat. Arch Oral Biol. 1996 Jan;41(1):127-131.
10. Tadej G, Engstrom C, Borrman H, Christiansen EL. Mandibular condyle morphology in relation to malocclusions in children. Angle Orthod. 1989 Fall;59(3):187-194.
11. Hesse KL, Artun J, Joondeph DR, Kennedy DB. Changes in condyle position and occlusion associated with maxillary expansion for correction of functional unilateral posterior crossbite. Am J Orthod Dentofacial Orthop. 1997 Apr;111(4):410-418.
12. Bishara SE, Burkey PS, Kharouf JG. Dental and facial asymmetries: a review. Angle Orthod. 1994;64(2):89–98.
13. Egermark I, Carlsson GE, Magnusson T. A prospective long-term study of signs and symptoms of temporomandibular disorders in patients who received orthodontic treatment in childhood. Angle Orthod. 2005;75(4):645-650.

DETERMINATION OF RISK IN CARIES DEVELOPMENT IN PATIENTS CARRIERS OF FIXED APPLIANCES



EŞIAN DANIELA [1], BICĂ CRISTINA [1], JURCĂ ANAMARIA[1]

[1]Department of Pedodontics - Orthodontics, University of Medicine and Pharmacy, Targu-Mures

ABSTRACT

Aim. *Orthodontic treatment achieved especially with fixed appliances is an additional risk factor in the development of carious processes by increasing and maintaining increased levels of cariogenic bacteria in saliva, but in the same time affects negatively the marginal periodontal tissue with the frecquent occurrence of gingival inflammation and bleeding of gums.*

Material and methods. *For this study were selected two groups with subjects aged 12-16 years old, respectively a control group of 10 patients without fixed appliances and a main group of 10 patients wearers of fixed appliances. In both groups were determined the salivary level of Streptococcus mutans and Lactobacillus and also the degree of caries-activity (based on values of index DMFT) and the pH value of saliva. In the same time the subjects were questioned about oral hygiene habits, respectively tooth brushing frequency, the use of mouthwash and interdentally toothbrush.*

Results. *The results of this study showed that all subjects from the main group were within the high risk group for caries initiation processes although the degree of caries activity is low or medium. More, it were observed lower values of salivary pH compared with those obtained in the control group even in patients whose degree of oral hygiene is good and very good.*

Conclusions. *Orthodontic treatment carried out especially with fixed appliances represent an additional risk factor in the initiation of carious lesions by increasing and maintaining high levels of cariogenic bacteria in saliva.*

Key words: *DMFT index, Streptococcus mutans, Lactobacillus, salivary pH*

Correspondence to:

Dr. Eşian Daniela
Address: Str. Pandurilor, 83/8, Târgu-Mures
Phone: +4 0729921317
E-mail address: danielaesi@yahoo.com

INTRODUCTION

The appearance of carious lesions in children presents a wide variety of issues and the carious process is the result of the imbalance between the *risk factors*, represented in particular by the pathogenic microorganisms and alimentation and the *protective factors*, such as additional measures of prevention and oral hygiene. The most popular and accepted hypothesis is the chemic-parasitic theory of *Miller* which emphasizes the role of microorganisms in the occurrence of carious processes. *Miller* did not indicate a specific bacterial species, but he incriminated all bacterial strains of the oral cavity as capable of fermenting carbohydrates with production of organic acids responsible for the tooth mineral dissolution [1].

The first micro-organism incriminated in the initiation of dental caries was ***Lactobacillus acidophilus***, normally present in the oral cavity flora but whose number increases significantly with 2-3 months before the occurrence of dental caries, phenomenon called "explosion of *Lactobacillus*"and decreases after the appearance of dental injury. However, the acid produced by the *Lactobacillus* represents only 0.025%, which means that it plays only a secondary role in initiating the caries processes and its appearance is related to decrease salivary pH in the oral environment [2]. Thus, the number of *Lactobacillus* was correlated with activity of another microorganism, *Streptococcus mutans*, whose major role in initiating caries process by demineralization of hard tissues is incontestable.

Streptococcus mutans (S.mutans) is a Gram-positive bacteria that through the ability to produce extracellular polysaccharides has the capacity to adhere to the tooth structure and through intracellular polysaccharides it creates energy reserves, so that the level of produced acids, mainly lactic acid, remain constant even under an external low intake of sugar. The main feature of *S. mutans* is its acidophilicity so that under acidic conditions it thrives and become the dominant bacteria of oral cavity. On the other hand, falling pH-levels prevents many oral strains from growing whereas the *S. mutans* counts increase [3].

Fixed orthodontic appliances increase the number of retentive areas in the oral cavity, reduce the possibility of dental buccal surface self-cleaning and impede the proper oral hygiene. As a result, the oral cavity of the patient carrying the fixed appliances undergoes a series of changes such as retention of food debris and low values of pH which creates favorable conditions for multiplication and propagation of *S. mutans* colonies in oral cavity.

Quantitative analysis of *S. mutans* in saliva was proposed first by *Klock and Krasse*, who found that the salivary concentration of these microorganisms is directly correlated to their quantity in dental bacterial plaque. Moreover, saliva is sampled more easily than dental plaque, which should be collected from many teeth in order to be representative of the whole mouth of an individual [4]. Previous studies have shown that an increased salivary level of *S. mutans* alone is not a decisive indicator for a high caries risk and thus determination of both S. *mutans* and the *L. acidophilus* counts, increases accuracy of microbiological evaluation from saliva [5].

Aim. The objective of this study is to determine the correlation that exists between the salivary level of *S. mutans* and *Lactobacillus,* the presence of fixed appliances as a risk factor in the development of carious processes and the degree of caries-activity based on DMFT index values ((**D**=decay, **M**= missing, **F**= filling, **T**=teeth).

MATERIAL AND METHOD

This study was conducted with the approval of the Research Ethics Committee of University of Medicine and Pharmacy, Targu-Mures (No.6/17.04.2012).

Selection of subjects

For this study were selected two groups: **a control group** consisted of 10 subjects, 6 girls and 4 boys who are not carriers of orthodontic appliances and **a main group** of 10 subjects, 6 girls and 4 boys also, whose main selection criteria is the presence of a fixed appliance on one or both arches. All subjects selected for the study aged 12 to 16 years. For examination, the informed consent was obtained from both the management of their schools and from their parents. Examination of children was done in Pediatric Dentistry Clinic of UMF Targu-Mures. In parallel with the examination of dental formula, the children were questioned about oral hygiene habits, especially the frequency of dental brush, mouthwash rinsing and eating habits (use of sweets and carbonated drinks between meals). Also, the degree of caries-activity of all subjects from both groups was evaluated using DMFT index according to the dental caries diagnostic criteria WHO (World Health Organization) [6]. The DMFT score is defined as the total number of teeth with caries, missing teeth or number of fillings for an individual. When calculating the DMFT index, teeth extracted for orthodontic reasons, or, primary teeth lost as a result of the physiological process of resorption, were no taken into account. Also, restored teeth with recurrent caries were considered as decayed.

After the DMFT score was calculated, all the subjects in both groups were assigned to one of three groups depending on the degree of caries-activity as follows:

1. low caries-activity (DMFT= 0- 3)
2. medium caries-activity (DMFT= 4-6)
3. High caries-activity (DMFT > 7).

Microbiological examination

Semi-quantitative determination of *S. mutans* and *Lactobacillus* was carried out using the *CRT® Bacteria test* (Ivoclar-Vivadent). This test enables the simultaneous determination of salivary level of cariogenic bacteria and the assessment of caries risk by including in one of the two risk groups regarding the appearance of caries lesions, respectively a low caries risk and a high caries risk. The *CRT ® Bacteria kit* test contains a pipette used to covered the culture media with saliva, a $NaHCO_3$ (sodium hydrogen carbonate) tablet to ensure appropriate conditions for growth and bacterial multiplication by releasing CO_2 (carbon dioxide) when it comes in contact with moisture and the specific selective medium for the two cariogenic microorganisms. *S. mutans* was identified by specific procedures that involve *mitis-salivarius blue agar* with bacitracin and *Lactobacillus* was identified on *Rogosa agar medium*.

Saliva sampling and medium cultivation

Before saliva collection, no food was allowed 1h before the test as well as no antibacterial mouthwash use 12-24 h before the test. To stimulate salivation and to transfer bacteria from the dental surfaces to the saliva, the subjects chewed 1-2 minutes a paraffin pellet enclosed in the test kit and then the saliva was collected in a suitable sterile container. After the protective foil has been removed, using a pipette, both agar culture media were entirely covered with saliva, carefully without scratching the surfaces, holding the agar carrier slightly oblique to prevent saliva from flowing off too quickly and thus favoring the bacterial growth. The bacteria will grow only in areas that have come in contact with saliva. The

agar carrier was closed tightly by placing it back immediately into the vial, with previous addition of $NaHCO_3$ –tablet at the bottom of the vial.

After cultivation, the agar carrier was placed upright in an incubator (Mini-incubator –Cultura from Ivoclar-Vivadent) and incubated at 37°C/ 99F for 48 hours, sufficiently to allow the bacterial colonies to grow. After agar medium cultivation, the determination of the salivary pH for each sample was performed, using a special test paper (*Paper pH-test).* The results obtained by comparison with the standard color map for pH have been reported to normal average children's pH, which is 7.5, higher than the average in adults (6.7).

Interpretation of microbiological results

Semi-quantitative determination of salivary level of cariogenic bacteria was obtained for each agar medium by comparing the density of *S. mutans* and *Lactobacillus* colonies with the corresponding images in the enclosed model chart. *S. mutans* shows as **small blue colonies** with a diameter of < 1 mm on the blue agar, while *Lactobacillus* grows as **white colonies** on the transparent agar.

A **B**

Figure 1. The aspect of cariogenic bacteria colony on specific culture media
A. Streptococcus mutans (level ≥ 10 ^{5} CFU)
B. B. Lactobacillus (level < 10 ^{5} CFU)

Frequently, on the specific *Lactobacillus* medium, yeasts may also grow, especially *Candida albicans,* whose appearance is distinguished by larger size and cream-coloured colonies (Fig.1.B).Thus findings:

- a salivary level of ***S. mutans*** **and** ***Lactobacillus*** **lower than 10^5 CFU** (colony-forming units) per milliliter of saliva indicates a **low risk** for caries occurrence and
- a level of ***S. mutans*** **and** ***Lactobacillus higher than*** 10^5 CFU framed the subjects in a **high risk** group for caries development.

In order, to facilitate the results interpretation, these groups have been quantified with **1** and **2** for the low-risk group (< 10^5 CFU), respectively with **3** and **4** for the high-risk group (≥ 10^5 CFU).

RESULTS

The results from both groups are presented in the following tables.

Table I. The parameters recorded to subjects from control group

No	Age (years)	Gender	*Fixed appliances*	DMFT	*Streptococcus mutans*	*Lactobacillus*	pH level	Oral hygiene
1.	14	F	-	1	< 10^5CFU (1)	< 10^5CFU (2)	7,5	3 times/day
2.	14	F	-	0	< 10^5CFU (1)	< 10^5CFU (1)	7	3 times/day
3.	13	M	-	3	< 10^5CFU (2)	< 10^5CFU (2)	7	2 times/day+MR

4.	12	F	-	5	≥ 10 ^{5}CFU(3)	< 10 ^{5}CFU (2)	6	2 times/day
5.	13	M	-	6	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	7	1-2 times/day
6.	14	F	-	4	< 10 ^{5}CFU (2)	< 10 ^{5}CFU (2)	7	2 times/day
7.	15	F	-	3	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6,5	1-2 times/day
8.	14	M	-	3	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6,5	2 times/day
9.	16	M	-	8	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6	2 times/day
10.	12	F	-	10	≥ 10 ^{5}CFU(4)	≥ 10 ^{5}CFU(4)	5,5	1 time/day

Table II. The parameters recorded to subjects from main group

No.	Age (years)	Gender	*Fixed appliances*	DMFT	*Streptococcus mutans*	*Lactobacillus*	pH level	Oral hygiene
1.	12	M	One arch.	4	≥ 10 ^{5}CFU(4)	< 10 ^{5}CFU (2)	6	3 times/day
2.	12	M	One arch	3	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6	2 times/day
3.	13	F	One arch	4	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	5,5	2 times/day
4.	14	M	One arch	5	≥ 10 ^{5}CFU(4)	≥ 10 ^{5}CFU(3)	6	2times/day +MR
5.	15	F	One arch	2	≥ 10 ^{5}CFU(4)	≥ 10 ^{5}CFU(3)	6	2 times/day
6.	15	F	One arch	5	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(4)	6	2 times/day
7.	15	F	Both arches.	3	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6,5	3times/day+MR
8.	16	F	Both arches.	3	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6,5	3times/day+MR
9.	16	F	One arch	6	≥ 10 ^{5}CFU(3)	≥ 10 ^{5}CFU(3)	6	2 times/day
10.	16	M	One arch	7	≥ 10 ^{5}CFU(4)	≥ 10 ^{5}CFU(3)	6	1 time/day

The results showed that in the main group of subjects with fixed appliances was observed in all cases increased salivary levels of *S. Mutans* and *Lactobacillus* (≥ 10 ^{5}CFU**)**, belonging to high risk group (No 3 or 4) in development of carious processes. In the control group it was observed that the salivary level of cariogenic bacteria is reduced in subjects with low degree of carioactivity compared with subjects in the main group that shows high levels of these micro-organisms even in cases with low degree of cario-activity.

Analyzing the degree of caries-activity within this group it was observed a mean of DMFT index Mt= 4,1, respectively M g= 3,5 in girls and Mb= 5 for boys, which places this group in a low and medium degree of caries-activity. Moreover, by analyzing the pH salivary levels in subjects from main group of study are observed average M_p = 6.05 lower than the average for the control group (M_c =6.6). These pH values are low even in patients who presents a rigorous oral hygiene.

DISCUSSIONS

The possibility of semi-quantitative determination of the salivary level of *S. mutans* and *Lactobacillus* represents a major progress in the current dental practice. *Gold et al.* [7] have used the agar blue mitis-salivarius medium with bacitracin for the first time in 1973 and it is still used because of the selective development of *S. mutans* strains, while other microorganisms are inhibited. *S. mutans* has the ability "quorum sensing"to detect the density of its population of cells and use that information through gene expression to adjust the biofilm mainly through peptide complex for stimulation (CSP). **Senadheera D. and Cvitkovitch DG (2008)** showed that the addition of a large amount of CSP leads to an "arrest "and possibly increasing bacterial cell death [8].

Ahumada et al. [9] have analyzed the origin of *Lactobacillus* in children with dental decay and without decay; they have noticed that in children with decays, 78% of the lactobacilli came from the tongue and 22% from the gums, while in children without dental decays, 42% of lactobacilli came from the tongue and 12% from the gums. This research suggests that these oral

mucous surfaces are reservoirs for *Lactobacillus. Sullivan and Storvick* [10] also showed that there is no statistically significant association between the salivary pH and *Lactobacillus* count. In another study, *Parvinen and Larmas* [11] have found that the pH plays an important role in primary colonization of saliva with *Lactobacillus* and that a low pH increases the number of bacteria.

More recently, it was found that negative correlation with caries incidence (the probability that *S. mutans* free subjects do not develop caries) was more reliable and predictive than positive correlation (probability that subjects with high *S. mutans* counts develop caries) [4]. In another study, *Matee et al.* [12] found a significant relationship between *S. mutans* level and dental caries index, but they also observed high levels of this microorganism in children who did not present carious lesions, which suggests that the presence of cariogenic bacteria does not necessarily mean high caries activity and the presence of protective factors such as fissure sealing, topical fluoride application, mouthwash rinsing, may reduce the risk of caries development in children.

In our study we found that there is no significant association between the salivary level of *S. mutans* or *Lactobacillus* and the oral hygiene. Thus, were observed lower values of cariogenic bacteria in saliva in patients who practiced tooth brushing with a frequency of 3 times a day and use an extra mouthwash but the degree of risk in caries process initiation remains high ($\geq 10^5$ CFU). **Nakas et al. (2011)** showed that frequent use of chlorhexidine gluconate from mouthwash may reduce statistically significant the salivary levels of *S. mutans* in patients carriers of fixed appliances, thus reducing the risk of developing carious processes [13].

Other studies have shown that tooth brushing does not have a significant effect on salivary level of cariogenic bacteria [14] but can balance the negative effect of these microorganisms on dental hard tissues [13].

In the main group was observed that all subjects are included in the risk group of developing carious processes though the degree of cario-activity is medium or low. More, it was observed low values of salivary pH level even in subjects whose oral hygiene degree is good and very good.

Carrillo E.L. et al. (2010) have shown that the orthodontic treatment has an anticariogen effect by increasing salivary flow but also affects the periodontal tissue effect signaled by gingival bleeding due to inflammation caused by retention of increased amounts of microbial plaque [15]. For patients who have an increased risk of developing caries processes orthodontic treatment need to be delayed and it will start only after 3 months, during which it will evaluate the patient's ability to achieve and maintain a good oral hygiene [16].

A remarkable example of the balanced relationship between salivary and oral micro biota is the fact that saliva is supersaturated with calcium and phosphate ions, which precipitate to form hydroxyapatite and re-mineralize the teeth [17]. This supersaturated solution should theoretically result in uncontrollable tooth growth as a result of constant precipitation of calcium phosphate onto the teeth. However, proteins present in saliva, especially those containing proline and a peptide called statherin, have been shown to slow the rate of precipitation of these ions to a rate that perfectly matches the rate of decay induced by bacteria during normal lactic acid formation [18].

CONCLUSIONS

In conclusion, the results of this study were correlated with the data from literature and emphasize the primary role played by the microbial factor in etiology of dental caries. Orthodontic treatment achieved especially with fixed appliances is an additional risk factor in the development of carious processes by increasing and maintaining increased levels of cariogenic bacteria in saliva and thus these cases of orthodontic patients need additional measures of prevention dental decay.

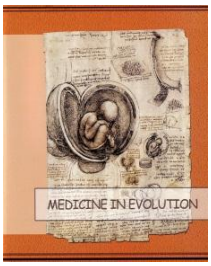
The possibility of semi-quantitative determination of cariogenic microorganisms from saliva by using *CRT bacteria test* represents a simple and efficient method to evaluate the degree of caries activity especially in children who required orthodontic treatment.

Acknowledgements: The sponsors had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

REFERENCES

1. Gafar M.- Odontologie.Caria Dentara.Editura Medicala.S.A., Bucuresti, 1995: 45-65
2. Monea Pop Monica, Monea Al. – Caria simplă.Ed. University Press Târgu-Mureş, 2006, cap.4-6: 41-88
3. Harper D.S., Loesche W.J.- Growth and acid tolerance of human dental plaque bacteria.Archs.Oral Biol. 29; 1984:843-848
4. Petti S. – Salivary distribution of Streptococcus mutans in schoolchildren from Rome (Italy).European Journal of Epidemiology, Vol.13; No.1; Jan.1997:113- 115
5. WHO: Oral Health Surveys: Basic Methods, 3rd edn.Geneva:World Health Organization, 1997
6. Gold O.G., Jordan H.V., Van Houte J.- A selective medium for Streptococcus Mutans; Archs.Oral Biol. 18, 1973:1357-1364
7. Senadheera D, Cvitkovitch DG.- Quorum sensing and biofilm formation by Streptococcus mutans.Adv Exp Med Biol. 2008;631:178-88.
8. Ahumada María del Carmen, López, María Elena, Colloca María Eugenia, Nader-Macía María Elena -Lactobacilli Isolation from Dental Plaque and Saliva of a Group of Patients with Caries and Characterization of their Surface Properties. Anaerobe. Volume 7, Issue 2, April 2001, 71-77
9. Sullivan J.H., Storvick C.A. - Correlation of Saliva Analyses with Dental Examination of 574 Freshmen at Oregon State College. J.Dent.Res. 29;1950: 165-172
10. Matee MI, Mikx FH, Maselle SY, Van Palestein Helderman WH- Mutans streptococci and lactobacilli in breast-fed children with rampant caries.Caries Res. 26;1992:183-187
11. Nakas Enita, Vildana Dzemidzic, Alisa Tiro, Enes Pasic, Sanja Hadzic - Antimicrobial activity of chlorhexidine in patients with fixed orthodontic appliances. Braz J Oral Sci. 2011 ; Volume 10 (2): 79-82
12. El-Nadeef, Bratthall D. - Intraindividual variations in counts of mutans streptococci measured by "strip mutans "method; Scand.J.Dent.Res. 99,1991: 8-12
13. Kala V., Venkanteshwara R. - Enamel demineralization. The Orthodontic Cyber Journal May 2011, online
14. Aiuchi H., Kitasako Y., Fukuda Y., Nakashima S., Burrow M., Tagami J. Relationship between quantitative assessments of salivary buffering capacity and ion activity product for hydroxyapatite in relation to cariogenic potential. Australian Dental Journal 2008, 53: 167–171
15. Loesche W.J.- Role of Streptococcus Mutans in Human Dental Decay. Microbiological Reviews 50(4):1986:353-380

THE INFLUENCE OF MICROCLIMATE AND EXISTING CONTAMINATION ON THE PERIODONTAL



LUPULESCU TEODORA EVA[1], COJOCARU IOANA[2], MORARIU STELIAN[3], ANGELA CODRUȚA PODARIU[4], URTILĂ EMIL[5], COVRIG VALERIA[6]

[1]University of Medicine and Pharmacy „Victor Babes"Timisoara, teaching assistant Dental School, Faculty of Medicine, Arad.
[2]University of Medicine and Pharmacy „Victor Babes"Timisoara, student.
[3]University of Medicine "Vasile Goldiş"Arad.
[4]Department of Preventive, Community Dentistry and Oral Health, Faculty of Dentistry,University of Medicine and Pharmacy „Victor Babes"Timisoara, Romania
[5]Department of Cranio-Maxillo-Facial Surgery, University of Medicine and Pharmacy „Victor Babes"Timisoara Romania.
[6]Department of Dental Prosthetics, University of Medicine "Vasile Goldiş"Arad

ABSTRACT

The problem of microclimate influence and the contamination on the periodontal represents a much less studied domain. This domain is at the border between the pathology of professional and dental diseases. In different branches of industrial activity an important number of people are exposed to special conditions of caloric radiation, electromagnetic or substances as: plumb, chromium, cadmium, iron, arsenic, or silica. The oral manifestations in contaminant poisoning represent a gate of the toxins in the human body and are the place of early manifestations of general diseases. Symptoms such as: gingival line, periodontitis or gingival inflammations can be characteristic signs of alarm and often occur early, a long time before the general symptoms.

Key words: *contamination, microclimate, periodontal, stomatitis, plumb*

Correspondence to:

Dr. Lupulescu Teodora Eva
Address: Dental School, Faculty of Medicine, Arad, com.Tudor Vladimirescu, M Eminescu nr.60, ARAD
Phone: +4 0745063958
E-mail address: teodora_lupulescu@yahoo.com

INTRODUCTION

The dependence of living organisms to the environment is reported from the ancient times. Physical agents acting on organisms can be divided in two big categories:

- Natural physical environments including: heat, cold, humidity, barometric pressure drop, light, cosmic rays,
- Artificial physical environments include: air pollution, toxic fumes, toxic substances, electromagnetic radiation, noise.

The widespread use of devices equipment in national economy and development of devices industry led to a situation where large groups of persons are exposed to radio waves in the microwave band. The annual research in the air-spatial domain, development of automation and communication, and also the use of speed devices in various branches of science and engineering have opened up tremendous opportunities for the use of radio-electronics. The explosive development in radio-electronics and its widespread penetration in different sectors of the economy (radio communication, television, radar, radio navigation, radio-spectroscopy, radio astronomy etc.) led to a situation where the number of people who come into contact with microwave radiation is increasing with each passing year. The study of this radiation led to the belief that radio waves in the microwave band can have both pathogenic effects and, in some circumstances, a therapeutic action on the human body. In this regard, there were issues of paramount industrial hygiene, which involves determining the negative effects of radio waves made by the human body, setting the maximum permissible exposure levels, and the development of preventive and protective measures.

The complexity of industrial technologic processes, agricultural, and the desire for profit made for the human exposure that produces or consumes these products to be more varied in contamination. The degree of exposure depends on the length and concentration of pollutants. During a long-term exposure to harmful substances, such as metals and non-metals, toxic substances penetration into the human body over the allowed limits, as the presence of favorable conditions can cause functional and morphological manifestations at different organs and systems, including the oral cavity. The occurrence of such oral events portends either increased oral intake of toxic, either decreased overall body strength exhibit.

The salivary flow decreases in volume, and becomes more viscous and more acid and therefore is no longer easily self-cleaning of food debris, the microbial germs forming the oral plaque cannot be removed in normal conditions, the processes leading to development of multiple caries and inflammatory type periodontitis.

MATERIAL AND METHOD

The occupational disease study involving a great difficulty that comes from both firms operating analyze subjects and are not interested in providing casework illnesses and diseases in which are involved several organs and affected systems. At the subjects analyzed are superimposed the direct action of harmful substances simultaneously with the irritation type of noxious agents or the microclimate.

The study that we conducted in collaboration with the Department of Occupational Diseases Hospital of

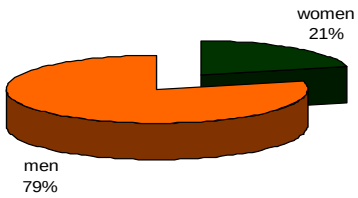
Arad Municipality was carried out on 284 subjects working in conditions of exposure to harmful action of toxic fumes, toxic substances, electromagnetic radiation, noise, atmospheric pollution among these after the dental exam a group of 48 subjects of different age, different sex with seniority in work from 5 to 20 years coming from businesses which are exposed to various toxins, presented dental disorders associated with professional illnesses.

Before starting this study the subjects were informed about its purpose and their consent were obtained, in write and signed. It was necessary obtaining the permission of the company manger to develop the research, and also the support of the mangers. Were not included in the study the subjects who have not given their consent or they did not received it from the manger.

The subjects were evaluated in natural light. The natural light or artificial was used according to the examination conditions. The clinical exam was performed by a single dentist with dental instruments (probe, forceps, disposable dental mirror) with detailed examination of dental and periodontal affected areas. Were visually inspected, and the suspects were explored with the probe to determine the contours and the surface defects. Diagnosis was made by comparison with standard images after from medical point of view was familiar with the injuries as defined by the authors.

Table and graphic 1. Distribution of sujects by gender

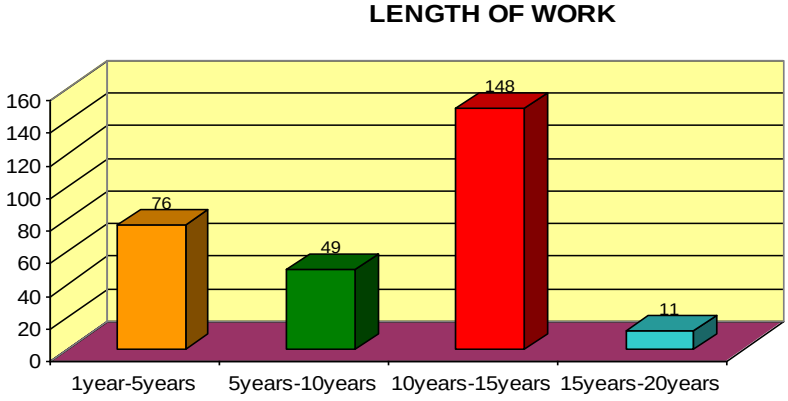
SUBJECTS	WOMEN	MEN
284	88	196



Statistically the number of men enrolled in this study is higher because they were subject to study in the small and medium companies (wood processing industry, construction industry of machinery parts, road construction industry, clothing industry, trade and services).

Table and graphic 2. Seniority of subjects

1year-5years	5years-10years	10years-15years	15years-20years	total
76	49	148	11	284



Regarding the working years, the ones with age from 1 years and 5 years is very high 52% because exists a high migration of labor. It is noted due to economic difficulties of the free market that the number of companies resists in time without changing the profile is less and therefore the number of those that have seniority in the area is reduced with 4% (the ones with seniority 15 years – 20 years).

Table 3. The predictor level of the microclimate and occupational contamination

VARIABLE	No of SUBJECTS	PERCENTAGE %
GENDERS	284	
MEN	196	69%
WOMEN	88	31%
SENIORITY		
1-5 years	148	52%
5-10 years	76	27%
10-15 years	49	17%
15-20 years	11	4%
LABOR CONDITIONS		
Pb	108	38%
Cu	75	29%
Hg	9	3%
Se	17	6%
Phosphates	38	13%
Acrylic	29	10%
Stress	241	85%
Physical exhaustion	209	74%
Radiations	56	20%
Vicious positions	197	7%
LIVING CONDITIONS		
>1000 lei	125	44%
<1000lei	159	56%
EDUCATIONAL LEVEL		
>10 classes	72	25%
<10 classes	212	75%

Table 4. Oral manifestations and their degree of addressability at the specialized treatment

VARIABLE	No SUBJECTS	%	TREATMENT	
			EMERGENCY	CONSERVATIVE
Congestive buccal mucosa with glossy aspect	2	0,5%	2	
Edematous gingival mucosa	4	8,3%	2	
Ulcerated gingival mucosa	3	6,3%	1	2
True periodontal pockets	19	39,6%	6	5
False periodontal pockets	4	8,3%	2	1
Periodontal abscess	11	22,9%	8	1
Spontaneous gingival	16	33,3%	10	2
Caused gingival	37	77,1%	7	11
Gingival retractions	24	50%	5	16
Gingival hypertrophy	12	25%	7	5

VARIABLE	No SUBJECTS	%	TREATMENT	
			EMERGENCY	CONSERVATIVE
Teeth with tartaric deposits	46	95,8%	5	21
Gingival lizereu	5	1,1%	2	1
Hyper chrome dental deposits	8	16,7%	3	2
Simple caries	362	43%	145	110
Complicated dental caries	171	20,3%	46	29
Extractions	694	45,2%		

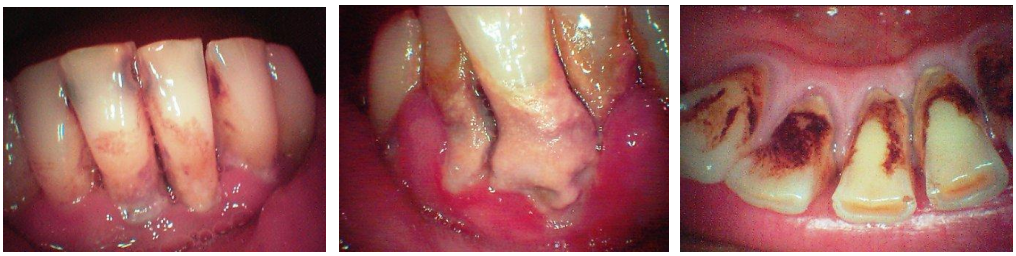


Figure 1. periodontal abscess, tartaric deposits teeth, hyper chrome dental deposits

Table 5. Dental maxillary apparatus diseases at the analyzed subjects

VARIABLE	No SUBJECTS	%
Necrotizing ulcerative stomatitis	1	2,08%
Medium intensity stomatitis	9	18,75%
Easy stomatitis		
Congestive form	6	12,6%
Catarrhal form	2	4,16%
Ulcerative form	1	2,08%
Marginal chronic profound periodontitis with atrophic appearance	4	8,33%
Superficial marginal chronic periodontitis	13	27,08%
Periodontal abscess	11	22,92%
Glossitis	1	2,08%

Figure 2. marginal atrophic periodontitis, periodontal abscess, medium intensity stomatitis

RESULTS

Generally the symptoms and manifestations at the dental-maxillary apparatus that we have found during the course development and we have shown in the tables from above falls among those described in the specialized literature. The most common oral lesions at the bucal mucosa were detected in the form of spontaneous gingival bleeding (33.3%) and especially challenging (77.1%) (chewing, tooth brushing), in case of a stomatitis with medium intensity and much rare as necrotizing ulcerative stomatitis. These manifestations were found at the subjects that work in

medium with environmental exposure at Hg, Cu, Pb.

The features is that due to the chronic exposure to work experience of over 10 years, frequently occurs gingival stomatitis, as necrotic ulcerative stomatitis.

Regarding the periodontal marginal lesions, commonly encountered are superficial marginal gingivitis and periodontitis (27.08%) and much smaller percentage marginal periodontitis with atrophic aspect (8,33%). As a clinical manifestations I frequently met gingival swelling, gingival papillae congestion as purple-red color, with fake periodontal pockets and sometimes periodontal abscess (22.9%). Subjectively, the patients accuses sensation of gum itching. Gingival bleeding caused at chewing or brushing make them to stop the oral hygiene, thus worsening the situation.

Gingival lisereum present only in 5 cases was determined by the presence of tartaric blocks favorable in the retention areas (dental or prosthetic ingrowth iatrogenic), having different colors depending on the type of contamination, grey, scarlet with Pb, black with Hg or green with Cu.

From clinical observations that we conducted in this study, deep chronic marginal periodontitis either it is shallow or profound it takes clinical forms by early involution of periodontal towards the age of the subject.

Regarding the dental lesions at the subjects exposed to a toxic environment, statistically I ascertain that the number of simple caries (43%) or complicated (20,3%) is no higher at this one's than at the subjects non-exposed. Exposure to pollutants has does not have a cariogenic effect.

DISCUSSIONS

Oral manifestations at contaminant exposure and micro-climate variations we have found that although are not in a first place of a general symptomatology, except for acute intoxication, they can be a warning signal, that indicates a decrease in overall body strength. We ascertain that toxic work environment for the subjects group 1 year – 5 years is not a decisive factor in the onset of disease, but irritant action of superimposed pollution (stress, longer working hours, radiation, heat variations and light intensity), those who often neglect or ignore wearing protective equipment.

CONCLUSIONS

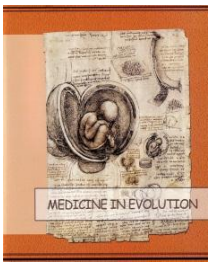
We can say with certainty that the mechanism of periodontitis occurrence in exposures to pollutions and microclimate influences is extremely complex and depends heavily to the prior exposure dental status, age, working years in the environment, the consciousness of properly wearing the protection equipment, dental hygiene, establishment of preventive measures.

It is clear that despite numerous technical progress there are still many risks of occupational illnesses. The occupational risks are unavoidable in many professions. Employers should be guided by the dictum "to be occupational productive, should be healthy."Must be remembered that each technology can exert a direct negative impact on the recipient and his family. Must always be a balance between maximum and minimum benefits without affecting in any way the health.

REFERENCES

1. Slagter AP, Bosman F, Van der Bilt A (1993) Comminution of two artificial test foods by dentate and edentulous subjects. J Oral Rehabil 29,
2. Morita M, Nishi K, Kimura T, Fukushima M, Watanabe T, Yamashita F, Zhou R, Yang J, Xu X (2003) Correlation between periodontal status and biting ability in Chinese adult population. J Oral Rehabil 30, 97-186.
3. Daniel, M., and F. Dusba´bek. 1994. Micrometeorological and microhabitat factors affecting maintenance and dissemination of tick-borne diseases in the environment, pp. 91Ð138. In D. E. Sonenshine and T. N. Mather [eds.], Ecological dynamics of tick-borne zoonoses. Oxford University Press, New York.
4. Semtner, P. J., D. E. Howell, and J. A. Hair. 1971. The ecology and behavior of the lone star tick (Acari: Ixodidae). I. The relationship between vegetative habitat type and tick abundance and distribution in Cherokee Co., Oklahoma. J. Med. Entomol. 8: 329Ð335.
5. Kanerva L, Estalender T, Jolanki R, Alanko K. False-negative patch test reactions due to a lower concentration of a patch test substances then declared. Contact Dermatitis 2000; 42: 219-99.
6. Bellissimo-Rodrigues WT, Bellissimo-Rodrigues F, Machado AA. Occupational exposure to biological fluids among a cohort of Brazilian dentists. Int Dent J 2006; 56: 308-7.
7. Kai M, Luebeck EG, Moolgavkar SH. Analysis of the incidence of solid cancer among atomic bomb survivors using a two-stage model of carcinogenesis. Radiat Res 1997; 102: 219-58.
8. Winship, K. A. Toxicity of inorganic arsenic salts. Adv. Drug. React. Acute poisoning Rev. 3, pp 141-17, 1984.
9. Zachariac, H., Sogard, H., and Nyfors, A. Liver biopsy in psoriatics previously treated with potassium arsenate. Acto Derm Venereol (Stock). 54, pp 115-229, 1974.
10. NAS. Medical and biological effects of environmental pollutants: Arsenic Washington, D. C.National Academic of Science. 1977.
11. Nordenson, I., Sweins, A., and Beckman, L. Chromosome abberations in cultured human lymphocytes exposed to trivalent and pentavalent arsenic. Scand. J. work Environ. Health. 7, pp 153-206, 1981.
12. Moore, J. E. In modern treatment of syphilis. Charles C Thomas. (ed.) Springfield III, 1933.
13. Morton, W. E., and Caron, G. A. Encephalopathy: An uncommon manifestation of workplace arsenic poisoning. Am. J. Ind. Med. 15, pp 3-9, 1989.
14. Podariu Angela, Jumancă Daniela, Găluşcan Atena, Văcaru Roxana, Muntean Ramona – Tratat de prevenţie oro-dentară - Editura Waldpress Timişoara, 2003
15. Emil Urtilă, Marius Pricop. Infecţiile Buco-Maxilo-Faciale Editura Helicon Timişoara 1993 p 11- 49
16. Swimmer L. Occupational disease and disorders as related to dentistry, J. Dent. Res, 1953 p14-18,
17. Pambuccian Gr. Infrastructura celulei şi a ţesuturilor normale şi parodontale şi patologice. Actualităţi medicale1971 p 9-54.
18. Gadariu Ghe, Barhad B, Gavrilescu N Igiena muncii, Editura Medicală Buc1967 p 52-91.
19. Practica Medicinii Muncii- subredacţia Toma Ion, Editia revizuită şi adăugită, Ed. Sitech Craiova 2011 p 67-112
20. Medicina Ocupaţională, vol. I si vol. II- subredacţia Aristotel Cocârlă, Ed. Medicală Universitară „ Iuliu Haţegan", Cluj Napoca 2009 p 35-62

ASSESSMENT OF WORK-RELATED MUSCULOSKELETAL DISORDERS RISK IN DENTAL TECHNOLOGY



ADRIAN BOLOS[1], CRISTINA MARIA BORTUN[2], MIRELLA ANGHEL[3], OTILIA BOLOS[4]

1 Victor Babeș˝ University of Medicine and Pharmacy Timisoara Department of Dental Technology, PhD student
2 Victor Babeș˝ University of Medicine and Pharmacy Timisoara, Department of Dental Technology
3 Victor Babeș˝ University of Medicine and Pharmacy Timisoara, Department of Oral Diagnosis and Ergonomics
4 Victor Babeș˝ University of Medicine and Pharmacy Timisoara, Department of Esthetic Dentistry

ABSTRACT

Introduction: *Dental technicians perform work, that is extremely delicate and time consuming. Sitting posture during work, with precise manual handling of small objects, may lead to back pain and strains of the musculoskeletal system.*

Aim of study: *To evaluate the risk of work-related musculoskeletal disorders development at dental technicians.*

Material and Method: *40 dental technicians from western part of Romania, aged between 24 and 61 years participated to study. The subjects were asked to fill in a questionnaire regarding their work style, their medical problems related to work and their recovery mode.*

Results: *94% of subjects use to work 8-10 hours a day, 5-6 days a week. All study participants argue that give importance to working posture, but 40% of them think, this is dictated by the performed procedure. All study participants reported work-related medical problems, pain being the most common: 91% experienced wrist pain, while 83% had thumb pain; 25% reported cold fingers and shaking hands. 55% of questioned dental technicians practice sport occasionally.*

Conclusion: *There is an ever-growing need for dental technicians to be aware of their job hazards, to recognize possible risks and to implement appropriate preventive measures to protect their health.*

Key words: *dental technician, musculoskeletal disorder, health*

Correspondence to:

Bortun Cristina Maria
DMD, PhD, Professor
Address: "Victor Babes"University of Medicine and Pharmacy Timisoara, Faculty of Dentistry, Department of Dental Technology, Blv: Revolutiei 1989, no.9
E-mail address: cristinabortun@gmail.com

INTRODUCTION

The work in dental technology laboratory as dental technician is extremely delicate and time consuming. A high degree of manual dexterity, good vision, and the ability to recognize very fine color shadings are necessary. An artistic aptitude for details and precise work is also important [1].

Salaried technicians usually work 40 hours a week, but self-employed technicians frequently work longer hours. Sitting posture during work, with precise manual handling of small objects, may lead to back pain and strains of the musculoskeletal system [2]. The musculoskeletal problems were identified as the most common complaints among technicians. It was demonstrated that smaller loads on the low back and neck cannot be ignored due to their magnitude if their duration is long [3].

In general, dental technicians work in clean and well-lighted areas, although this may not always be the case. Technicians usually have their own workbenches, equipped with Bunsen burners, grinding and polishing equipment and hand instruments. This is a job with relatively stable tasks and the process is used worldwide, but the occupational exposure can vary, according to working conditions and materials used [4].

Dental technician may be specialized in one of five areas: orthodontic appliances, crowns and bridges, complete dentures, partial dentures, or ceramics. In some laboratories, technicians perform all stages of the work, whereas in others each technician does only a few.

Among the hazards of the job, one can consider the following: 1. chemical hazards (they include solvents, mineral acids, gases and vapors released during polymerization, metal casting and porcelain baking, as well as dust from plaster, alloys, ceramics and acrylic resins); 2. respiratory effects (like cough and phlegm, as well as decreased respiratory functions); 3. allergies, asthma, dermatitis (due to exposure to various allergens and irritant factors, like wet work, contact with plaster, mechanical friction and thermal changes); 4. physical hazards (like noise- caused by grinding, cutting, polishing operations and exhaust ventilation or hand/arm vibrations while working with various tools); 5. other hazards that include risk of acquiring infections from dental prostheses or impressions that have been not properly disinfected [5].

The aim of the study was to assess the risk of work-related musculoskeletal disorders among 40 dental laboratory technicians.

MATERIAL AND METHOD

40 dental technicians from western part of Romania (Timisoara, Arad, Caransebes), aged between 24 and 61 years, were taken into study. All subjects filled in a questionnaire, that was divided in 4 sections.

The first section included besides the general data (like gender, height, weight, age), information about seniority in work and not least the importance given to the working posture.

The second section included questions regarding the way of work of the studied dental technicians:

- How many hours a day, how many days a week;
- How many breaks during work and their duration;
- The working posture.

The third section consisted of questions about any work-related medical events:

- If there appeared medical problems caused by the activity of dental technician;
- If these problems required sick leave with or without hospitalization;
- Pain, numbness or anesthesia in the wrist;
- Pain, numbness or anesthesia in the thumb;
- Pain, movement limitation, muscle spasm, crepitation in the neck;
- Pain in the shoulder with sensitivity decrease;
- Index and middle finger numbness, with atrophy of the triceps;
- Finger numbness and decrease or atrophy of the biceps;
- Cold fingers or shaking hands during work;
- Pain or mobility loss in the shoulder;
- The moment of symptoms onset: during or after work (how long after).

The fourth section revealed information about the subjects´ way of recovery:

- How many days off a year and at what interval;
- If there exist any kind of sport activity in a week (if yes, what kind);

Frequency and duration of the sport activity.

RESULTS

40 dental laboratory technicians, aged between 24 and 61 years, from the western part of Romania (20 men and 20 women) were taken into study: 34 from Timisoara, 4 from Arad, 2 from Caransebes.

- 94% of subjects use to work 8-10 hours a day, 5-6 days a week;
- 20% of subjects were overweight;
- All study participants argue that give importance to working posture, but 40% of them think, this is dictated by the performed procedure;
- All study participants reported work-related medical problems, but only 10% of them required sick leave without hospitalization;
- Seniority in work (Fig.1), breaks during work activity (Fig.2) and work-related medical events (Fig.3,4,5,6) are represented in graphics below.

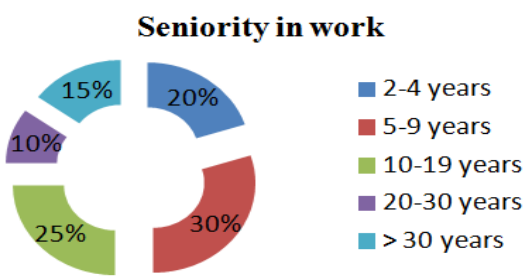


Figure 1. Graphical representation of seniority in work of the study participants

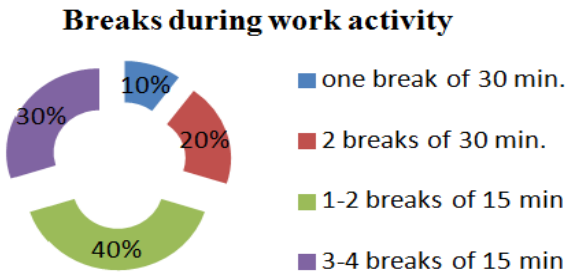


Figure 2. Graphical representation regarding the breaks that dental technician use to have during their work activity

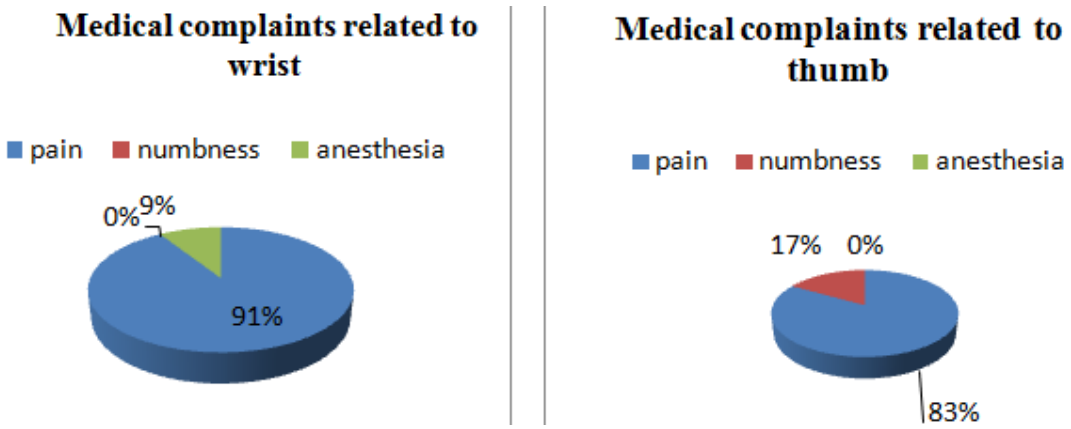


Figure 3,4. Graphical representation of medical complaints related to wrist and thumb

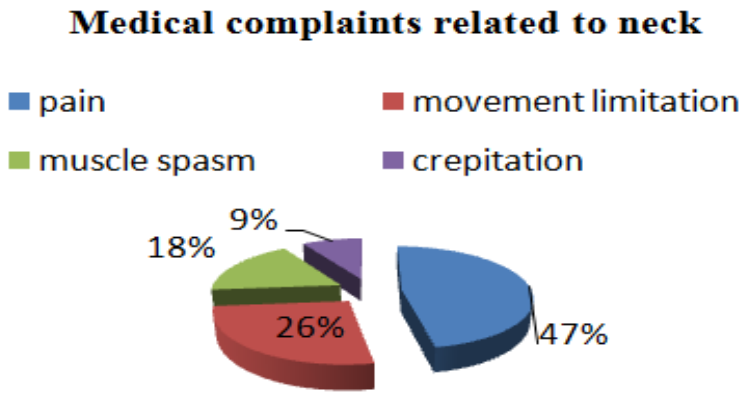


Figure 5. Graphical representation of medical complaints related to neck

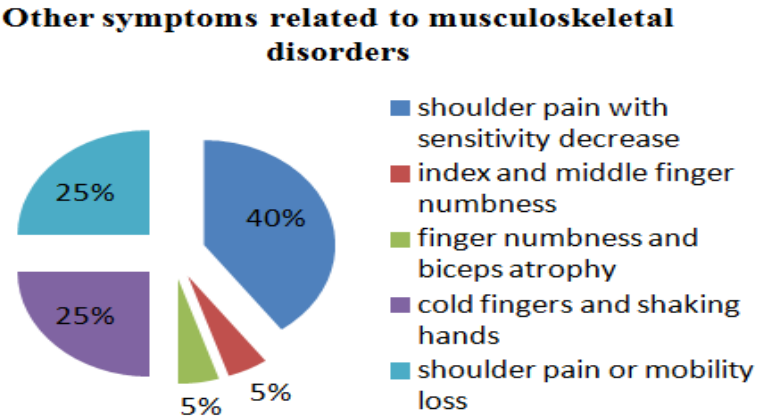


Figure 6. Graphical representation of different symptoms related to musculoskeletal disorders

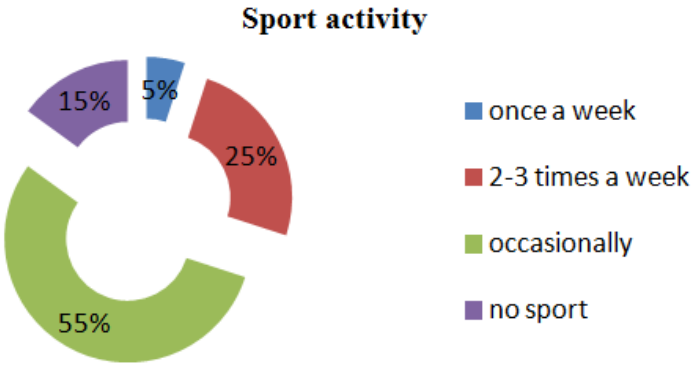


Figure 7. Graphical representation of sport activity among dental technicians

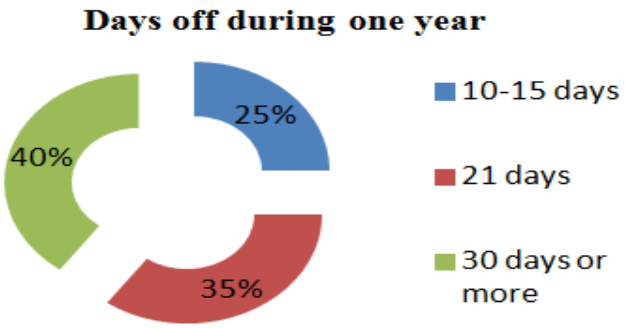


Figure 8. Graphical representation of the days off in one year of dental technician activity

- 60% of subjects reported pain during work and 30% experienced pain both during and after work;
- The dental technicians´ way of recovery is given in Fig.7, 8.

CONCLUSIONS

Dental technician profession is at risk of developing musculoskeletal dysfunctions. There is an ever-growing need for dental technicians to be aware of their job hazards, to recognize possible risks and to implement appropriate preventive measures to protect their health.

To prevent musculoskeletal and repetitive strain disorders, improvement of height relationships of a chair and different work surfaces should be considered. Apart from one longer rest in a silent and well-ventilated area, personnel should have at least two 10-minute breaks more, preferably performing some exercise for arms and spine. Appropriate working posture, 45 minutes sport activity three times a week and 2-3 days off every 6 weeks are also recommended.

Dental technicians should regularly undergo specific medical examinations with the aim of assessing their fitness for work. During the check-ups, they should also be educated about the potential health hazards, recognition of early health effects and safety practice.

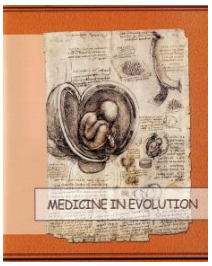
Acknowledgements

Research supported by PhD fellowship POSDRU 107/1.5/S/ID78702.

REFERENCES

1. Sales Peres A, Paschoarelli LC, Silva RHA, Kushima F (2005). Technological interface in the dentists' professional activities: ergonomics design boarding. Rev Fac Odontol Aracatuba, 26: 44-48;
2. Sartorio F, Vercelli S, Ferrrriero G, D'Angelo F, Migliario M, Franchignoni M (2005). Work-related musculoskeletal diseases in dental professionals. 1. Prevalence and risk factors. G Ital Med Lav Ergon, 27(2):165-169;
3. Newell TM, Kumar S (2005). Comparison of instantaneous and cumulative loads on the low back and neck in orthodontists, Clin Biomech; 20(2):130-7.
4. Torbica N, Krstev S (2006). World at work: Dental laboratory technicians, Occup Environ Med 63(2): 145-148;
5. Jacobsen N.; Derand T.; Hensten-Pettersen A. (1996). Profile of work-related health complaints among Swedish dental laboratory technicians, Community Dent Oral Epidemiol 24:138-144.

TREATMENT OPTIONS IN ANTERIOR CROSSBITE OF DENTAL ORIGIN. CASES PRESENTATION



POP SILVIA-IZABELLA[1], BRATU DANA CRISTINA[2], GYERGYAI REKA[1], POP RADU VASILE[3]

[1]Phd Student, Department of Paedodontics and Orthodontics, University of Medicine and Pharmacy Târgu-Mureș, 38 Gh. Marinescu street, Târgu Mureș, Mureș, 540139
[2]Assist. Professor, Department of Paedodontics and Orthodontics, University of Medicine and Pharmacy Victor Babeș, 9 Revoluției Street, Timișoara
[3]Dentist, Private practice, 1 Caraiman street, Târgu Mureş

ABSTRACT

Aims. *Crossbites of dental origin are defined as displacement of teeth, involving only some of the teeth in an area of the arch. They are considered less severe than crossbites due to skeletal discrepancies.The aim of this work is to outline and to exemplify the various treatment posibilities in anterior crossbites of dental origin.*

Material and methods. *Three cases of anterior crossbite of dental origin are presented. The therapeutic approach depended on several factors: space requirements, type of dentition, patient cooperation and specific characteristics of the malocclusion. The crossbites were treated with removable and fixed appliances.*

Results*. The main emphasis needs to be placed on the correct diagnoses and evaluation of malocclusion. Choosing the appliance for therapy must consider the overbite. Patient- orthodontist cooperation is important for the best outcome of the treatment.*

Conclusion. *Early correction of the crossbite of dental origin is important to prevent development of skeletal anomalies.*

Key words: *crossbite, orthodontics, removable orthodontic appliance*

Correspondence to:

Dr Bratu Cristina
Address: UMF Victor Babes Timisoara, 9 Revoluției Street, Timisoara
Phone: +4 0744835314
E-mail address: danacristinabratu@yahoo.com

INTRODUCTION

Crossbites of dental origin are defined as displacement of teeth, involving only some of the teeth in an area of the arch. They are less severe than crossbites due to skeletal discrepancies [1]. Crossbites of dental origin are classified as Class I malocclusions, because the major underlying cause is the inclination of the maxillary incisors [2].

The most important etiologic factor for nonskeletal anterior crossbite is lack of space for the permanent incisors. Also, eruption disturbances, with premature loss of deciduous incisors and delayed eruption of permanent incisors can cause alteration of the teeth position, resulting in anterior crossbites [1,3-7]. In permanent dentition, the crossbite can cause temporo-mandibular disorders [6].

In the diagnosis of anterior crossbite, critically important is to differentiate the skeletal problems of deficient maxillary or excessive mandibular growth from crossbites due only to displacement teeth. Dental crossbites and skeletal problems coexist in many patients [7,8]. Also, it must be determined whether a functional shift exists between centric relation and centric occlusion, because interferences are often present and they usually lead to shift on closure. The diagnostic evaluation in mixed dentition should determine whether tipping will provide appropriate correction, or it requires stripping or extraction of the adjacent primary teeth. Space opening procedures also can be necessary [1].

Various appliances have been devised for treatment of anterior crossbite, such as removable plates with springs, fixed appliances or inclined plates [1, 8,9]. In mixed dentition, removable appliances using fingersprings for facial movement of maxillary incisors or active labial bow for lingual movement of mandibular incisors are indicated. The use of a biteplate to reduce overbite is only necessary when an excesive deep bite is present or in child with clenching or grinding habit [1,2,8].

Fixed appliances are also used for correction of anterior crossbites. The treatment of the anterior crossbite is recommended in primary and mixed dentition, however early treatment does not always eliminates orthodontic treatment need in permanent dentition [8]. The aim of this work is to outline and to exemplify the various treatment posibilities in anterior crossbites of dental origin.

CASE REPORTS

We will present three therapeutic options for anterior crossbite of dental origin.

Case Report 1

I. Anamnesis. The patient,C.I, female, aged 8 years and 7 months, came in our practice 11 months ago. The parents' major complaint was her daughter's esthetic appearance when smiling. Her general medical and dental history were not significant and she had no family history of any oral or dental anomaly.

II. Clinical examination data. Extraoral examination revealed a slightly retrusive upper lip with class III tendency (Figure 1a,b). The patient had no extractions, and had several caries on the deciduous teeth. Minor crowding (about 2-3 mm) was present in the upper arch (Figure 1 c,d). Intraoral examination revealed a Class I malocclusion), confirmed by the examination in all the 3 plans:

Sagital plan

Right and left molars: dental class I

Canines: bilaterally class I

Incisors: 11,21,22 and 63 upper permanent central incisores, upper left lateral incisor and upper left primary canine in crossbite

Transversal plan

Neutral relationships posteriorly, 2 mm shift of the lower midline to left.

Vertical plan

Neutral relationship posteriorly

Normal overbite at the level of the incisors

III. Aditional paraclinical investigations. Cephalometric examination confirmed the class I skeletal relationship, with slightly protruded mandibulary incisors and retruded maxillary incisors.

IV. Treatment and evolution. With the parent's approval, the objectives of the orthodontic treatment were to correct the malocclusion, therefore a superior removable appliance, with posterior biteplate was used (Figure 2). The active parts of the appliance consisted of 2 springs for the protrusion of the upper central incisors and a lower vestibular arch for the retrusion of the lower incisors. An expansion screw was also inserted, in order to solve the space problem. It was recommended a nearly full time wear of the plate (about 20-22 hours/ day) in order to be effective. The screw was activated once at every 2 weeks, with 1 turn.

In approximately 2 months the overbite was corrected (Figure 3 a,b c,) and the upper lip protruded (Figure 4). Retention was not considered to be necessary because the overbite of the incisors, at the end of the treatment was about 2 mm.

Figure 1 a,b. Extraoral view of patient, before treatment -case 1

Figure 1 c,d,e. Extraoral view of patient, before treatment -case 1

Figure 2. Appliance used in case

Figure 3 a,b,c. Intraoral aspect of patient after treatment-case 1

Figure 4. Extraoral view of patient after treatment-case 1

Case Report 2

I. Anamnesis. The patient, S.P., male aged 13, reported to our office for functional and esthetic reasons. General medical history was not significant. Dental history revealed early loss of the upper primary incisors due to extended caries.

II. Clinical examination data. Extra-oral examination showed a well-balanced face with slightly retrusive upper lip (Figure 5 a,b). Intraoral examination revealed a class I malocclusion, with all 4 upper incisors in crossbite (Figure 5 c, d e, f). The diagnosis was confirmed by the examination in all the three plans:

Sagital plan

Right molars and left molars: dental class I

Canine bilaterally neutral, class I

Incisors: crossbite

Transversal plan

Neutral relationships both anteriorly and posteriorly.

Vertical plan

Neutral relationship posteriorly

Inverse overbite of ½, of the incisors.

III. Aditional paraclinical investigations. The skeletal basis of the pacient was class I, confirmed by the lateral cefalogram tracings. The upper incisors were retruded (upper incisors to NA- 20 °)

IV. Treatment and evolution. The objectives of orthodontic treatment

were to correct the anterior crossbite and to establish normal overbite and overjet. The necessary space was anticipated to obtain due to the upper incisors proinclination.

The chosen orthodontic appliance was the fixed orthodontic appliance on the upper arch and a lower bite plate (Figure 6). The bite plate was considered necessary because of the deep bite. In 3 months the crossbite was corrected and the lower bite plate was no longer necessary. Afterwards, in order to achieve the best results, lower fixed appliance was recommended, but the patient refused. After 12 months the appliance was removed and a fixed twistflex retainer was placed to maintain the results (Figure 7 a,b,c,d,e). The profile did not change after the treatment (Figure 8)

Figure 5 a,b. Extraoral view of patient, before treatment -case 2

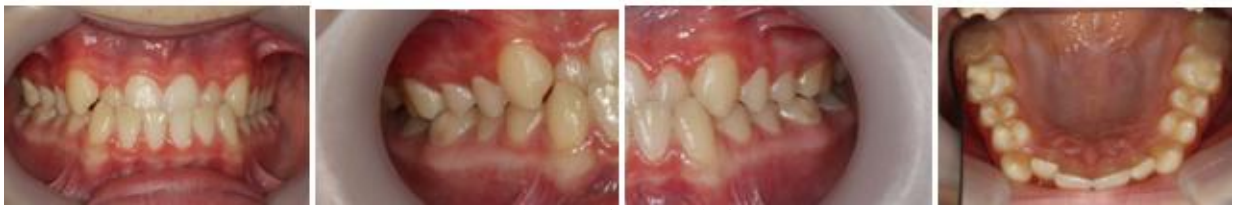


Figure 5 c,d,e. Intraoral view of patient before treatment- case 2

Figure 6. Appliances used in case 2

Figure 7 a.b.c.d.e. Intraoral aspect of patient after treatment-case 2

Figure 8. Extraoral view of patient after treatment-case 2

Case Report 3

I. Anamnesis. The patient, S.R., male, aged 24, came to our office for esthetic reasons, 6 months ago. General medical and dental history were not significant and he had no family history of any oral or dental anomaly.

II. Clinical examination data. Extraoral examination revealed a well-balanced face with normal facial profile and skeletal dental base relations (Figura 9 a,b). The patient had no extractions and caries. Moderate crowding (about 3 mm) was present in the upper arch and in the lower arch with lingual displacement of upper right lateral incisor and lower right lateral incisor. Intraoral examination revealed a Class I malocclusion (Figure 9 c,d,e,f,g), confirmed by the examination in all the 3 plans:

Sagital plan

Right and left molars: dental class I

Canines: bilaterally class I

Incisors: upper right lateral incisor in crossbite

Transversal plan

Neutral relationships posteriorly, 1 mm shift of the lower midline to right.

Vertical plan

Neutral relationship posteriorly

Normal overbite at the level of the incisors

III. Aditional paraclinical investigations. Cephalometric examination confirmed the class I skeletal relationship, with slightly retruded mandibulary and maxillary incisors.

IV. Treatment and evolution. The objectives of orthodontic treatment were to obtain space in order to correct the crossbite, to align the teeth for later prosthodontic care (venners). After consulting the patient, the therapeutic approach consisted of upper and lower fixed orthodontic appliance. Initially, only the upper appliance was placed.

The required space in the upper arch was gained due to incisors proclination, while in the lower arch a lip bumper appliance was placed. Composite build-ups on molars were used to open the bite during the crossbite correction. After 6 month the teeth are align, but in order to achieve the anticipated outcome the appliance will be kept in place until the dental and occlusal relationthips will be normalized (Figure 10 a,b,c).

Figure 9 a,b. Extraoral view of patient, before treatment -case 3

Figure 9 c,d,e,f,g. Intraoral view of patient before treatment- case 3

Figure 10 a.b.c. Intraoral aspect after the aligning phase- case 3

DISCUSSIONS

These cases reports illustrate the need for a correct treatment plan, not only at the treatment planning stage, but also throughout the entire course of treatment. The main objectives in the management of any anterior crossbite of dental origin case are to improve esthetics and restore masticatory function. The treatment plan should be based on a comprehensive evaluation of the age, occlusion, and space requirements of the patient. The

differential diagnoses with class III malocclusions, and crossbites due to skeletal discrepancies should also be done.

Treatment of the crossbite in mixed dentition is challenging because the growth and development of the oral structures have to be taken into account [11].

One of the treatment options is the use of removable plates [1,2]. Proffit stated that the most common problems with the removable appliances are lack of patient cooperation, poor designed leading to lack of retention and improper activation [1,2,11]. However, in our patient from case 1, the crossbite correction was achieved in less than 2 months, probably because of good patient-orthodontist cooperation. In the second case, bite plate was used to reduce the overbite and it was used for approximately 6 weeks.

A commonly used method to assess success rate and stability of crossbite correction has been to report the status of the overjet [9,11]. Our patients achieved a positive and often slightly overcorrected overjet during the active treatment. This positive overjet was maintained, after active treatment.

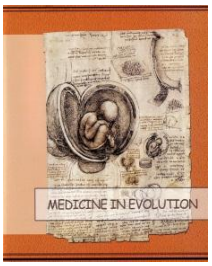
The other treatment option includes fixed orthodontic therapy. It has the advantages of more precise tooth movements and detailing of occlusion, but the space management must be carefully planned, sometimes, space opening devices being necessary [2,5,10].

The main emphasis needs to be placed on the correct diagnoses and evaluation of malocclusion. Choosing the appliance for therapy must consider the overbite. Patient-orthodontist cooperation is important for the best outcome of the treatment. Early correction of the crossbite of dental origin is important to prevent development of skeletal anomalies.

REFERENCES

1. Profitt WR, Fields HW. *Contemporary Orthodontics*. 3rd ed. St Louis, Mo: Mosby; 2000;276-277
2. Sharma PS, Brown RV. Pseudo mesiocclusion: diagnosis and treatment. *J Dent Child.* 1968;**35**:385–392.
3. McNamara JA. Mixed dentition treatment. In: Graber TM, Vanarsdall RL, eds. *Orthodontics: Current Principles and Techniques.* 2nd ed. St Louis, Mo: Mosby; 1994:507–541.
4. Rakosi T. Treatment of Class III malocclusion. In: Graber TM, Rakosi T, Petrovic AG, eds. *Dentofacial Orthopedics With Functional Appliance*. 2nd ed. St Louis, Mo: Mosby; 1997:462–480.
5. Kusy RP. A review of contemporary archwires: their properties and characteristics. *Angle Orthod.*1997: **3**;197–207
6. Rabie ABM, Gu Y. Diagnostic criteria for pseudo-Class III malocclusion. *Am. J Orthod. Dentofacial Orthoped*. 2000;**117**:1–9.
7. Gu Y, Rabie ABM, Ha¨gg U. Treatment effects of simple fixed appliance and reverse headgear in correction of anterior crossbites. *Am. J Orthod. Dentofacial Orthoped* 2000;**117**:691–699
8. Jirgensone I, Liepa A, Abeltins A. Anterior crossbite correction in primary and mixed dentition with removable inclined plane. *Balt Dent Maxillofac J.*,2008, **10**:140-144.
9. Major PW, Glover K. Treatment of anterior crossbite in early mixed dentition. *J Can Dent Assoc*. 1992;**58**:574–575,578–579.
10. Tulloch JFC, Antczak-Boukoms AA. A review of clinical research in orthodontics.. *Am. J Orthod. Dentofacial Orthoped*. 1989;**95:**499–504.
11. Kim JH, Viana MA, Graber TM, Omerza FF, BeGole EA. The effectiveness of protraction face mask therapy: a meta-analysis. *Am. J Orthod. Dentofacial Orthoped*. 1999;**115**:675–685.

SOFT TISSUE HEALING AND BONE REMODELING AROUND ONE-PIECE FULL SLA TREATED IMPLANTS USING A SHORT DRILLING PROTOCOL



SORIN MIHALI[1], CRISTINA MARIA BORTUN[2], EMANUEL BRATU[3]

[1]Department of Prosthodontics, University of Medicine and Pharmacy "Victor Babes" Timisoara,
[2] Department of Dental Technology, University of Medicine and Pharmacy "Victor Babes"Timisoara
[3]Dept. of Implant Supported Restorations, University of Medicine and Pharmacy "Victor Babes" Timisoara

ABSTRACT

Objectives: *The aim of this study was to examine the influence of short drilling protocol on the soft and hard tissue behavior around one-piece screw type implants.*

Material and methods: *Forty implants were inserted in different clinical case (24 patients). The implants (diameter 3.0 mm, length 11.5 – 13 mm) were inserted with the short drilling protocol sequence. Analysis of soft tissue and crestal bone level were measurement at the distal point of the alveolar crest for each implant using a periodontal probe and radiographs taken at insertion, 3 and 12 months after insertion.*

Results: *One of the 40 implants failed in the osseointegration during the 12-month follow-up period. Bone remodeled in almost all cases until the first thread, with a mean value of 1,8mm.*

Conclusions: *Using the narrow implants there is no significant crestal bone remodeling and the soft tissue adherence is very good on the rough surface neck.*

Key words: *one-piece implants, SLA treatment surface, short drilling protocol, soft tissue healing, bone remodeling*

Correspondence to:

Prof. Univ. Dr. Cristina BORTUN
Address: P-ta Eftimie Murgu No.2, Timisoara, Romania
Phone: +4 0745378254
E-mail address: cristinabortun@yahoo.com

INTRODUCTION

When a tooth or teeth are lost, resorbtion of the alveolar ridge in both width and height is unavoidable, especially in patients who have been edentulous for a long period of time. Coupled with anatomical restrictions, a standard diameter implant might not be a feasible option. In these clinical scenarios, numerous methods of alveolar ridge augmentation (1 have evolved, including blocks of autogenous bone-harvested from intra- and extra oral sources- being fixed to the resorbed ridge, and particulate grafts of autogenous, allogeneic, xenograft, or alloplasts, which are often combined with barrier membranes for example the guided tissue regeneration (GBR). Although widely utilized, these procedures are associated with greater patient morbidity, longer treatment time and higher costs, which might not be acceptable by some patients who are interested in implant therapy.

Another alternative treatment option might be the use of narrow diameters implants (NDI). The definition of "narrow implants"is not universal. It was defined as an implant with less than 3.75 mm in width (2, (3. Rationale for use of narrow diameters implants is to overcome some of the disadvantages brought about by bone augmentation surgeries. Although success rates of narrow diameter implants have already been analyzed in the literature, one meta-analysis based on prospective and randomized controlled trials, has been performed. One study analyzed the survival rates of narrow diameter implants compared to standard or wide diameter implants (4. The meta-analysis studies showed that narrower implants (< 3.3mm) had significantly lower survival rates compared to wider implants (≥ 3.3mm). In addition other variables such as type of prosthesis, implants surface and timing of prosthetic loading were found to have influenced the implant survival rates.

The use of narrow diameter implants is encouraging. A biomechanical analysis study (5 was purpose to examine force transmissions of narrow-diameter ITI implants when used as a terminal support for freestanding three-unit fixed partial dentures (FPD). Photo-elastic and strain-gauged models of two diameter of implant (normal 4.1 mm and narrow 3.3 mm diameter implant) implant supporting fixed prostheses were fabricated. A static force of 100 N was applied on both implants and on the intermediate of the prostheses in separate load cases, and the generation of isochromatic fringes was observed and photographed in the field of a circular polariscope. The use of reduced-diameter implants resulted in an overall increase in stress and strain magnitudes around supporting implants in comparison with support from two standard solid-screw implants. Narrow-diameter ITI implants may be used to support FPDs for patients with low bite forces. In other clinical situations involving narrow-diameter implants, increasing the implant support is crucial to improve the biomechanical outcome of the treatment.

One-piece implants have been in clinical use for several decades, evolving from steel to titanium, and from spiral shape to modern designs over the years. The treatment of the surface is different over the years. A retrospective study (6 assessed the 10-year outcomes of titanium implants with a sandblasted and acid-etched (SLA) surface in a large cohort of partially edentulous patients. The present retrospective analysis resulted in a 10-year implant survival rate of 98.8% and a success rate of 97.0%. In addition, the prevalence of peri-implantitis in this large cohort of orally healthy patients was low with 1.8% during the 10-year period.

AIM and OBJECTIVES

The present study evaluated the capability of soft and hard tissue behavior around narrow one-piece screw type implants under SLA treated surface. Another objective for this study was to determine the influence of reduced number of drills for implant osteotomies.

MATERIAL AND METHOD

The 40 implants were inserted to 24 patients, aged between 20 and 62 years, agreed to participate in the study, and signed a written informed consent. One piece implants (MIS UNO, MIS IMPLANTS, SHLOMI ISRAEL) diameter 3.0 mm, length 11,5 and 13 mm were clinically evaluated. The chosen patients were selected with narrow alveolar ridges with sufficient bone offer in height and about 4-5 mm bone width. No case needed bone augmentation for this implant diameter. The patients were all healthy, and with good oral hygiene. Smoking was not an exclusion criterion.

A crestal incision was performed and full mucoperiosteal flaps were elevated in the areas of implant insertion under local anesthesia. The implants have been inserted with the short drilling protocol sequence, with the use of a 2 mm pilot drill (marked the depth and angulation of the implant) and a 2,4 mm final drill. Implants were inserted using ratchet, until final position was reached. This position was considered right below the abutment, the threads being completely covered by bone. In the maxilla cases the final drill was used only in the cortical bone.

Periotest (Medizintechnik Gulden, Modautal, Germany) measurements were taken after insertion phase, and depending on periotest values, a decision of immediate restoration or healing time period was taken. All patients with negative periotest values received restorations (Fig. 1 c, d), the others waited for 3 months with restorations without any contacts (Fig. 1 a, b) (in form of plastic capes). In all cases immediate restorations have been placed over the implants. The immediate restorations were made of metal-ceramic, and cemented with provisional Temp-Bond cement (Kerr, Orange, Canada). Measurements were taken at the distal point of the alveolar crest for each implant with a periodontal soft tissue probe (Fig. 2). Soft tissue sounding was performed using a periodontometer 0,2 N (20g) (Aesculap, Melsungen, Germany).

Marginal bone loss (MBL) was analyzed on standardized peri-apical radiographic films. Films were taken on the surgical day, at 3 and 12 months after implant loading, using the paralleling technique with individual mounts. The radiographs were digitalized. The radiographic analyses were carried out with a software package under 12X magnification (Image J 1.46r, National Institute of Health). The MBL was measured from the implant apex to the first bone-to-implant contact at the distal sites, which was averaged to represent MBL for the implant (Fig. 3).

Clinical and radiographic measurements were obtained at the day of the implant insertion, at 3 months and 12 months. All data were summarized by mean, standard deviation, minimal and maximal level of soft tissue and bone remodeling. All statistical calculations of the radiographic data were performed using the statistical software SAS version 9.2 (SAS Institute Inc., USA) within the operating system Apple OS X version 10.8.4.

RESULTS

At insertion all implants reached a Periotest value with favorable readings from 02 to -04. After one-year follow-up, implants were clinically stable and osseointegrated. One of the 40 implants failed in the osseointegration period, probably due to bone resorbtion in the case of a very narrow ridge. The other implants showed good osseointegration. Bone remodeled in almost all cases over one year, with a mean value of 1,8 ± 0.33 mm, with a stable situation for the next year.

Probing depth values during the investigation period was summarized in the Table 1. Over this period the soft tissue reached values from 2 mm to 6 mm at suturing, from 1 to 5 mm at 3 months and from 1 to 4 mm at 12 months (Fig. 4) with a mean value of 2.90 ± 1.12 mm. No bleeding was observed. There was no significant difference between men and woman.

The group with the anatomical provisional restorations showed an even faster and better healing comparing to the ones with plastic capes.

All patients presented a fixed healed gingiva around the implants. Patients with tick peri-implant tissue presented smaller depths comparing to the ones with thin soft tissue.

Figure 1. Plastic vs. metal-ceramic restoration: a, c – clinical view of the one-piece implant; b – plastic capes without any contacts over the implant in the healing period; d – metal-ceramic restoration over implants.

Figure 2. Probing depth with periodontometer after: a) insertion; b) 3 months c) 12 months

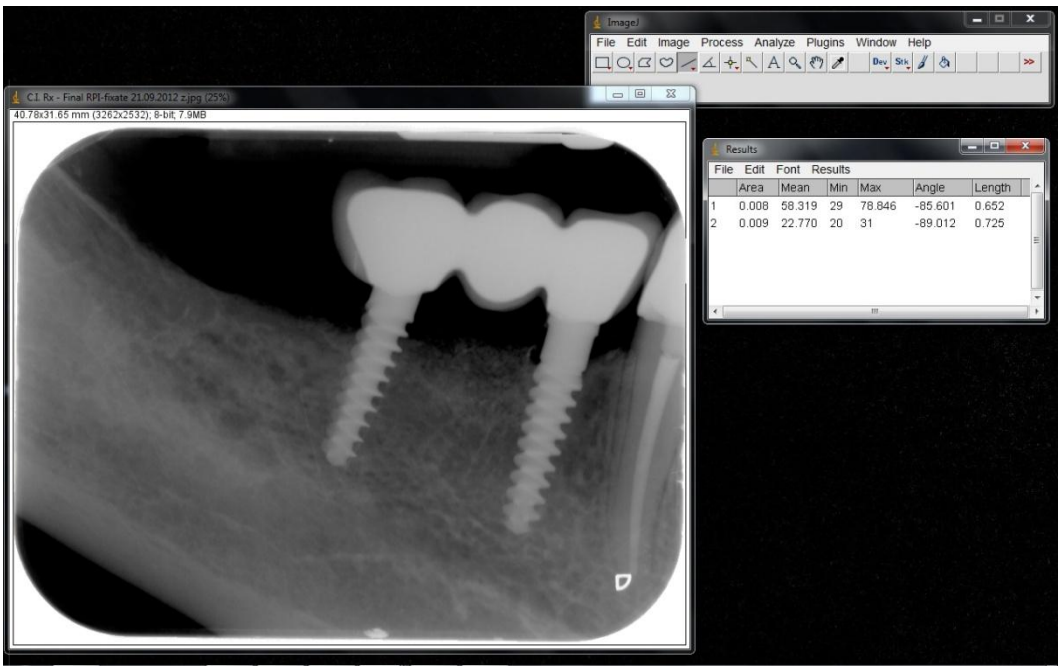


Figure 3. X-ray analyzes in Image J 1.46r software and its results in an xls database

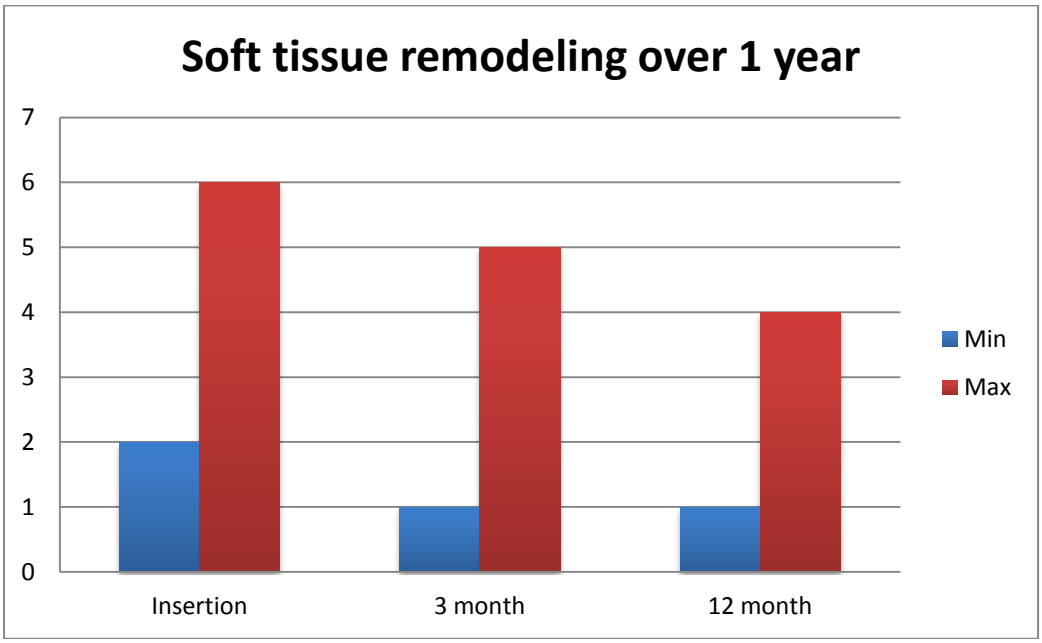


Figure 4. The soft tissue difference between intervals form insertion to 12 month with minimal and maximal values

Table 1. Statistical analyze of the soft tissue healing determined with periodontometer and of the bone remodeling using retro alveolar x-ray in mm over time

VISIT	**Probing depth – soft tissue**			**Radiographs – crestal bone level**		
	MEAN ±SD	Min	Max	Mean ±SD	Min	Max
Insertion	3.69 ± 0.95	2	6	0	0	0
3 month	2.64 ± 1.04	1	5	1.87 ± 0.39	0.8	1.93
12 month	2.34 ± 0.92	1	4	1.80 ± 0.33	0.6	1.95

DISCUSSIONS

The present clinical study evaluated the stabilization of soft and hard tissue around a narrow rough SLA treated surface implant.

At the initial examination after implant insertion, probing depths showed greater values comparing to the values obtained after 3 months. This is normal, because of the healing process of the peri-implant tissues. What is of clinical value, is the fact that there was no irritation of the soft tissues around the implants, during the healing period, which suggests, that regardless of receiving a provisional or not, the gingiva recovers well and adheres on a rough surface, if certain criteria are accomplished (8.

One piece implants with a SLA surface showed very good tissue integration (6, especially for the soft tissue at the implant neck. This type of implant has even today a large field of use in almost every clinical situation, presenting a minimal bone loss and allowing insertion in narrow ridges. Large augmentation procedures can be avoided. Even after 1 year of loading no significant changes of tissue around the implants were visible. Also, the prosthetic procedures are simple in case of good positioning of the implants. A problem that can occur in time is, that in the case of implant loss and abutment preparation, implant unscrewing can be difficult. This is why, sufficient prosthetic space has to be created before implant insertion in order not to destroy the abutment. Also, the clinician must be aware that only minor changes in implant insertion axis can be obtained with abutment preparation. For that reason, careful preoperative evaluation should be performed, and occlusion check should be made after pilot drilling.

The bone offer of patients differs significant in quantity and quality, and soft tissue is following these structures. Very often, patients refuse augmentative procedures, which are costly and sometimes involve important risk factors. Therefore, the use of one piece implants with reduced diameter, is still a treatment option even today, in the era of sub-gingival healing.

One big problem of modern implant dentistry, is maintaining soft tissue around dental implants. This problem is especially of great interest in the aesthetic zone (**Error! Reference source not found.**. Several methods of soft tissue management evolved in the last decades, with emphasis on soft tissue transpositions and transplants. These procedures are not always in reach of the general practitioner. Implant design has a great influence on bone and soft tissue level, as showed in different studies (7, (10. In the last 5 years, the polished neck of dental implants is loosing ground in favor of treated surfaces because of histological studies (11 that show a greater number and distribution of fibroblast around these surfaces. The non retentive parallel wall neck macro design of the UNO implant, comparing to other one piece implants favors a complication free healing even when gingival recessions occur.

Suturing technique is also important. Two interrupted sutures should be positioned very next to the implant abutment to avoid gaps between implant and tissue. Clinically, soft tissue adherence is very good on the rough surface neck of the UNO implant; which is in accordance with the histological results obtained in animal studies by different authors (7. Because of the small diameter of the implants there is possible in almost every case to obtain sufficient soft tissue thickness around the implant. Also, if the pocket depth, depends on the thickness of the mucosa, the thicker the mucosa, the smaller the depth. However, if the gingiva is not fixed, problems of plaque deposits can arise, and implant failure is possible.

CONCLUSIONS

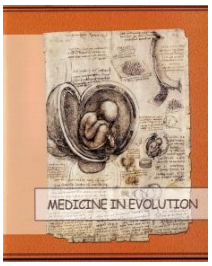
The study demonstrated that there is no absolute need of a polished implant neck in order to prevent peri-implant tissue irritation, if a fixed gingiva around the implant can be obtained. Initial results are promising, but further investigation and longer observation periods are needed in order to have a statement on this issue.

In conclusion, in terms of both clinical and aesthetic criteria, small diameter, mini-dental implants can be successfully used as an alternative to treatment with fixed partial dentures.

REFERENCES

1. Levin BP. Alveolar ridge augmentation: combining bioresorbable scaffolds with osteoinductive bone grafts in atrophic sites. A follow-up to an evolving technique. Compend Contin Educ Dent. 2013 Mar;34(3):178-86.
2. Arisan V, Bölükbaşi N, Ersanli S, Ozdemir T. Evaluation of 316 narrow diameter implants followed for 5-10 years: a clinical and radiographic retrospective study. Clin Oral Implants Res. 2010 Mar;21(3):296-307.
3. Mijiritsky E, Mazor Z, Lorean A, Levin L. Implant diameter and length influence on survival: interim results during the first 2 years of function of implants by a single manufacturer. Implant Dent. 2013 Aug;22(4):394-8.
4. Ortega-Oller I, Suarez F, Galindo-Moreno P, Torrecillas-Martínez L, Monje A, Catena A, Wang HL. The Influence of Implant Diameter Upon its Survival: A Meta-Analysis Based on Prospective Clinical Trials. J Periodontol. 2013 Aug 1.
5. Cehreli MC, Akça K. Narrow-diameter implants as terminal support for occlusal three-unit FPDs: a biomechanical analysis. Int J Periodontics Restorative Dent. 2004 Dec;24(6):513-9.
6. Buser D, Janner SF, Wittneben JG, Brägger U, Ramseier CA, Salvi GE. 10-year survival and success rates of 511 titanium implants with a sandblasted and acid-etched surface: a retrospective study in 303 partially edentulous patients. Clin Implant Dent Relat Res. 2012 Dec;14(6):839-51.
7. Orsini E, Salgarello S, Bubalo M, Lazic Z, Trire A, Martini D, Franchi M, Ruggeri A. Histomorphometric evaluation of implant design as a key factor in peri-implant bone response: a preliminary study in a dog model. Minerva Stomatol. 2009 Jun;58(6):263-75.
8. Di Alberti L, Rossetto A, Albanese M, D'Agostino A, De Santis D, Bertossi D, Nocini PF. Expression of Vascular Endothelial Growth Factor (VEGF) mRNA in healthy bone tissue around implants and in peri-implantitis. Minerva Stomatol. 2013 Jun 11.
9. Rodriguez AM, Rosenstiel SF. Esthetic considerations related to bone and soft tissue maintenance and development around dental implants: report of the Committee on Research in Fixed Prosthodontics of the American Academy of Fixed Prosthodontics. J Prosthet Dent. 2012 Oct;108(4):259-67.
10. Cehreli M, Sahin S, Akça K. Role of mechanical environment and implant design on bone tissue differentiation: current knowledge and future contexts. J Dent. 2004 Feb;32(2):123-32.
11. Piattelli A, Pontes AE, Degidi M, Iezzi G. Histologic studies on osseointegration: soft tissues response to implant surfaces and components. A review. Dent Mater. 2011 Jan;27(1):53-60.

MANAGEMENT AND PREVENTION OF ORAL CANCER – A REVIEW OF LITERATURE



ADELINA RAMONA BERARI[1], EMIL URTILA[2], ANGELA CODRUTA PODARIU[2], RUXANDRA SAVA-ROSIANU[2], ADINA BUCUR[3], SERBAN TALPOS[2], CIPRIAN PASCA[1], TEODORA EVA LUPULESCU[1], RAMONA AMINA POPOVICI[2]

[1]West University "Vasile Goldis"Arad, Faculty of Medicine, Pharmacy and Dental Medicine
[2]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry

ABSTRACT

Oral cancer is often preceded by specific oral lesions and oral conditions that are called precancerous. Oral cancer most commonly occurs in middle-aged and older individuals, although a disturbing number of these malignancies are also being documented in younger adults in recent years. There is now sufficient understanding of the causes to prevent at least one third of all cancers worldwide. Information is also available that would permit the early detection and effective treatment of a further one third of cases. Effective strategies exist for the relief of pain and the provision of palliative care to all cancer patients in need and of support to their families, even in low-resource settings. Although the existing body of knowledge about cancer prevention, treatment and palliative care is extensive, more still needs to be known in many areas, notably in etiology and prevention research. Implementation of effective, integrated and multi-sectorial preventive strategies targeting multiple risk factors for cancer will reduce in the long-term the incidence of cancer in sites such as oral cavity. However, it requires the facilities to confirm diagnosis and provide treatment, and availability of resources to serve the population in need.

Key words: *oral cancer, precancerous lesions, prevention, management, treatment*

Correspondence to:

Ramona Amina Popovici
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry, Splaiul Tudor Vladimirescu 14A
Phone: +4 0762006828
E-mail address: ramonaamina@yahoo.com

INTRODUCTION

Oral cancer is often preceded by specific oral lesions and oral conditions that are called precancerous. The most common oral precancerous lesion is oral leukoplakia. In studies, three clinical types of leukoplakia were recognized: homogeneous, nodular, and ulcerative. Among these, nodular leukoplakia is considered to be a high-risk precancerous lesion and homogeneous and ulcerated leukoplakia as moderate risk precancerous lesions. Several other tobacco-associated oral lesions are also seen in the oral cavity, and they are considered as carrying only a small extra risk that may not be significant. Among oral precancerous conditions, the most important one is oral submucous fibrosis. Oral lichen planus is another common condition, but it is not clear whether it came a significant excess risk of oral cancer.

EPIDEMIOLOGY OF ORAL CANCER

Oral cancer most commonly occurs in middle-aged and older individuals, although a disturbing number of these malignancies is also being documented in younger adults in recent years.[1-3] From an epidemiological and clinic-pathological perspective, "oral cancer"can be divided into three categories: carcinomas of the oral cavity proper, carcinomas of the lip vermilion, and carcinomas arising in the oropharynx. Intraoral and oropharyngeal tumors are more common among men than women, with a male:female ratio of over 2:1.2,8-9 However, the disparity in the male:female ratio has become less pronounced over the past half century, probably because women have been more equally exposing themselves to known oral carcinogens such as tobacco and alcohol.[4,1] In contrast to intraoral and oropharyngeal carcinomas, cancers of the lip vermilion are more akin epidemiologically to squamous cell carcinoma of the skin and occur primarily in white men.[5] These lip tumors are most strongly associated with chronic sun exposure, although sometimes they have been related to the site where cigarettes or pipestems have habitually been held. These malignancies are much more common in men, probably because men are more likely to have vocations and/or avocations that result in greater cumulative sun exposure. At one time, the lip was the most common site for oral cancer; however, the incidence of cancer in this location has decreased significantly over the past half century because fewer men hold outdoor occupations [5,4].

PREVENTIVE MANAGEMENT

There is now sufficient understanding of the causes to prevent at least one third of all cancers worldwide. Information is also available that would permit the early detection and effective treatment of a further one third of cases. Effective strategies exist for the relief of pain and the provision of palliative care to all cancer patients in need and of support to their families, even in low-resource settings. Although the existing body of knowledge about cancer prevention, treatment and palliative care is extensive, more still needs to be known in many areas, notably in etiology and prevention research. Nonetheless, this knowledge is not always put into practice. Efforts to prevent and control cancer are hampered by the low-

priority frequently given to the disease by governments and health ministries, excessive reliance and expenditure on treatment, and a considerable imbalance between resources allocated for basic cancer research and those devoted to its prevention and control. For example, primary prevention, early detection and palliative care are often neglected in favor of treatment-oriented approaches, even in cases where these approaches are not cost-effective and cause unnecessary human suffering. Another example is the failure to take into consideration the social inequalities related to cancer prevention and control. The overall goal of cancer prevention and control is to reduce the incidence and mortality of cancer and to improve the quality of life of cancer patients and their families. A well-conceived national cancer control programme is the most effective instrument to bridge the gap between knowledge and practice and achieve this goal. Integrated into existing health systems and related services, these programmes ensure systematic and equitable implementation of control strategies across the continuum of prevention, early detection, treatment and palliative care, as set out in WHO guidelines for national cancer control programmes.[6] A national cancer control programme can help policy-makers and programme managers make the most efficient use of available resources to benefit the whole population by taking a balanced approach to evidence based interventions. Prevention frequently offers the most cost effective long-term strategy for cancer control. Furthermore, cancer preventive measures are beneficial as they can also contribute to preventing other chronic diseases that share the same risk factors.

Implementation of effective, integrated and multi-sectorial preventive strategies targeting multiple risk factors for cancer will reduce in the long-term the incidence of cancer in sites such as oral cavity, stomach, liver, breast, uterine cervix, colon and rectum. Early detection, which comprises screening of asymptomatic populations and awareness of early signs and symptoms, increases the probability of cure. However, it requires the facilities to confirm diagnosis and provide treatment, and availability of resources to serve the population in need. The prevalence of the cancer should also justify the effort and expense. Awareness of early signs and symptoms is particularly relevant for cancers of the breast, cervix, mouth, larynx, endometrium, colon and rectum, stomach and skin. On the basis of existing evidence [6], population screening can currently be advocated only for cancers of the breast, cervix and colon and rectum, in countries where resources are available for wide coverage of the population, appropriate treatment is in place and quality-control standards are implemented. Nonetheless, studies are under way to evaluate low-cost approaches to screening that can be implemented and sustained in low-resource settings. Population studies on the predictive power as regards screening for oral cancer are also needed.[6].

STAGING AND TREATMENT

Treatment aims to cure disease, prolong life, and improve the quality of life. The most effective and efficient treatment is linked to early detection programmes and follows evidence-based standards of care. Treatment guidelines and praxis guides improve treatment outcome by setting standards for patient management. The formulation of guidelines and their adaptation to various resource settings help to assure quality including

equitable and sustainable access to treatment resources. Implementation of these guidelines can prevent the misuse of resources by ensuring that treatment is provided only to those patients whose cancers are at a stage where they would benefit from treatment. Patients can benefit either by cure or by prolonged life, in cases of cancers that are highly responsive to treatment.[7]

Because most individuals are seen more commonly by primary care physicians and general dentists than by specialists, it is important for these clinicians to perform screening examinations to identify potential oral and pharyngeal cancers. When a suspicious lesion is identified, a conventional biopsy using a scalpel or small biopsy forceps remains the best and most accurate means of assessing it. As stated by Alexander et al., "Noninvasive screening techniques such as cytologic testing (including brush biopsy)… have many pitfalls and should not be considered as substitutes for biopsy when there is concern about malignancy."[8] The biopsy can be obtained by the primary caregiver or by referral to a head and neck specialist (e.g., otolaryngologist/head and neck surgeon, oral and maxillofacial surgeon, etc.). In addition to the need for improved early detection by clinicians, it is also important that the patient and general public are knowledgeable about the disease [9,10]. Delays in identification and recognition of suspicious lesions contribute to advanced stage at diagnosis and lower survival statistics [11-18]. A complete, detailed discussion about the management of oral cancer and precancerous lesions is beyond the scope of this article. Generally speaking, it has been recommended that leukoplakias that show moderate epithelial dysplasia or worse be removed or destroyed if possible.2 The management of lesions showing mild dysplasia depends on the size, location, and apparent cause of the lesion. Sometimes early dysplastic lesions may be reversible if the source of irritation (e.g., smoking) can be eliminated. Molecular markers, such as DNA content and loss of heterozygosity, hold the promise of becoming important tools for predicting the risk of malignant transformation for oral leukoplakias.[19-21] The patient with invasive oral cancer is best managed by a coordinated, multidisciplinary team of health care professionals, which may include a head and neck surgeon, oral and maxillofacial pathologist, general pathologist, radiation oncologist, neuro-radiologist, reconstructive surgeon, medical oncologist, general dentist, oral and maxillofacial surgeon, maxillofacial prosthodontist, dental hygienist, nurse specialist, speech pathologist, nutritionist, and tobacco cessation counselor.[22] Up to 15 percent of individuals with oral cancer have been identified to harbor a second primary cancer; therefore, it is important that a complete head and neck examination, including the larynx, is performed.[23] Many clinicians perform an endoscopic examination to include the larynx, esophagus, trachea, and lungs in order to identify other potential lesions in the high-risk patient. For patients who present with a neck mass but no obvious primary site (or if the neck mass is more amenable to biopsy than the primary tumor), a fine needle aspiration remains the diagnostic method of choice rather than an open biopsy, because open biopsy has been reported to be related to a lower survival rate when not accompanied by a simultaneous neck dissection.[24,25] Imaging studies are now routinely performed to evaluate the primary tumor and neck disease. Both contrast-enhanced computed tomographic (CT) scans and magnetic resonance imaging (MRI) may be utilized in determining the extent of the primary tumor, invasion, regional lymph node status, and distant metastatic disease, thereby

providing important staging information. [26,27] Positron emission tomography (PET) scans are also becoming an increasingly popular tool for the identification of primary, recurrent, and metastatic disease. Treatment options are variable and depend on the size and location of the primary tumor, lymph node status, presence or absence of distant metastases, the patient's ability to tolerate treatment, and the patient's desires. Surgery and/or radiation therapy remain the gold standards for treatment of cancers of the lip and oral cavity. Oro-pharyngeal cancer may be treated with surgery and/or radiation therapy for early stage disease. For advanced-stage disease, surgery with adjuvant radiation therapy may be indicated, whereas recent evidence suggests that the addition of chemotherapy to radiation therapy may provide a survival advantage over radiation therapy alone in this population.[28,29] It is important to take into account disease status and prevalence of occult disease in the neck when evaluating primary cancers of the lip, oral cavity, and oropharynx.[30] Regardless of the treatment modality used, many patients will require consideration of problems related to airway protection, enteral feedings, xerostomia, mucositis, dysphagia, and voice change.

CONCLUSIONS

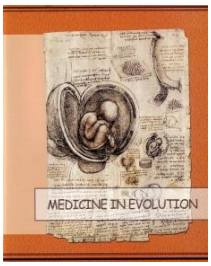
Surveillance and research are crucial for both planning effective and efficient cancer control programmes and monitoring and evaluating their performance [6]. A comprehensive surveillance system provides data on the magnitude of the cancer burden and trends in risk factors, and on the effect of prevention, early detection, treatment and palliative care. Cancer registries are part of the surveillance system. Population-based registries provide information on incidence cases and incidence trends; whereas hospital-based registries provide information regarding diagnosis, stage distribution, treatment methods and survival. Research contributes to determining causes of cancer and identifying and evaluating strategies for prevention, treatment and control. Hence research planning and priority setting are important elements of a cancer control programme.

REFERENCES

1. Chen JK, Katz RV, Krutchkoff DJ. Intraoral squamous cell carcinoma. Epidemiologic patterns in Connecticut from 1935 to 1985. Cancer 1990; 66:1288-1296.
2. Llewellyn CD, Johnson NW, Warnakulasuriya KA. Risk factors for squamous cell carcinoma of the oral cavity in young people — a comprehensive literature review. Oral Oncol 2001; 37:401- 418.
3. Schantz SP, Yu GP. Head and neck cancer incidence trends in young Americans, 1973-1997, with a special analysis for tongue cancer. Arch Otolaryngol Head Neck Surg 2002; 128:268- 274.
4. Silverman S Jr. Epidemiology. In: Silverman S Jr ed. Oral Cancer. 4th ed. Hamilton, Ontario, Canada: BC Decker Inc; 1998; 1-6.
5. Neville BW, Damm DD, Allen CM, et al. Oral & maxillofacial pathology. 2nd ed. Phila., PA: Saunders; 2002; 337-369.
6. World Health Organization. National cancer control programmes: policies and managerial guidelines: executive summary. Geneva: WHO, 2002.
7. Petersen PE, Oral cancer prevention and control – The approach of the World..., Oral Oncol (2008), doi:10.1016/j.oraloncology.2008.05.023
8. Alexander RE, Wright JM, Thiebaud S. Evaluating, documenting and following up oral pathological

conditions. A suggested protocol. J Am Dent Assoc 2001; 132:329-335.
9. Yellowitz JA, Goodman HS. Assessing physicians' and dentists' oral cancer knowledge, opinions and practices. J Am Dent Assoc 1995; 126:53-59.
10. Centers for Disease Control and Prevention. Preventing and controlling oral and pharyngeal cancer. Recommendations from a national strategic planning conference. MMWR 1998; 47RR-14.
11. Shafer WG. Initial mismanagement and delay in diagnosis of oral cancer. J Am Dent Assoc 1975; 90:1262-1264.
12. Elwood JM, Gallagher RP. Factors influencing early diagnosis of cancers of the oral cavity. Can Med Assoc J 1985; 133:651-656.
13. Guggenheimer J,Verbin RS, Johnson JT, et al. Factors delaying the diagnosis of oral and oropharyngeal carcinomas. Cancer 1989; 64:932935.
14. Prout MN, Hereen TC, Barber CE, et al. Use of health services before diagnosis of head and neck cancer among Boston residents. Am J Prev Med 1990; 6:77-83.
15. Schnetler JF. Oral cancer diagnosis and delays in referral. Br J Oral Maxillofac Surg 1992; 30:210-213.
16. Smart CR. Screening for cancer of the aerodigestive tract. Cancer 1993; 72:1061-1065.
17. Carpenter RD, Yellowitz JA, Goodman HS. Oral cancer mortality in Maryland. Maryland Med J 1993; 42:1105-1109.
18. Hollows P, McAndrew PG, Perini MG. Delays in the referral and treatment of oral squamous cell carcinoma. Br Dent J 2000; 188:262-265.
19. Rosin MP, Cheng X, Poh C, et al. Use of allelic loss to predict malignant risk for low-grade oral epithelial dysplasia. Clin Cancer Res 2000; 6:357-362.
20. Sudbø J, Kildal W, Risberg B, et al. DNA content as a prognostic marker in patients with oral leukoplakia. N Engl J Med 2001; 344:1270- 1278.
21. Lippman SM, Hong WK. Molecular markers of the risk of oral cancer. N Engl J Med 2001; 34:1323-1326.
22. Ord RA, Blanchaert RH Jr. Current management of oral cancer. A multidisciplinary approach. J Am Dent Assoc 2001; 132:19S-23S.
23. Lippman SM, Hong WK. Second primary tumors in head and neck squamous cell carcinoma: The overshadowing threat for patients with early-stage disease. Int J Radiat Oncol Biol Phys 1989; 17:691-694.
24. Lefebvre JL, Coche-Dequeant B,Van JT, et al. Cervical lymph nodes from an unknown primary tumor in 190 patients. Am J Surg 1990; 160:443-446.
25. Kleid S, Millar HS. The case against open neck biopsy. Aust N Z J Surg 1993; 63:678-681.
26. Som PM, Curtin HD, Mancuso AA. An imaging-based classification for the cervical nodes designed as an adjunct to recent clinically based nodal classifications. Arch Otolaryngol Head Neck Surg 1999; 125:388-396.
27. Robbins KT. Integrating radiological criteria into the classification of cervical lymph node disease. Arch Otolaryngol Head Neck Surg 1999; 125:385-387.
28. Forastiere A, Goepfert H, Goffinet D, et al. NCCN practice guidelines for head and neck cancer. National Comprehensive Cancer Network Proceedings. Oncology 1998; 12:39-247.
29. Calais G, Alfonsi M, Bardet E, et al. Randomized trial of radiation therapy versus concomitant chemotherapy and radiation therapy for advanced-stage oropharynx carcinoma. J Natl Cancer Inst 1999; 91:2081-2086.
30. Robbins KT, Atkinson JL, Byers RM, et al. The use and misuse of neck dissection for head and neck cancer. J Am Coll Surg 2001; 193:91 102.

PERIODONTITIS – A RISK FACTOR FOR CARDIO-VASCULAR DISEASES – A REVIEW



CIPRIAN PASCA[1], EMIL URTILA[2], ANGELA CODRUTA PODARIU[2], RUXANDRA SAVA-ROSIANU[2], ADINA BUCUR[3], IOANA MIHAELA CITU[3], ADELINA RAMONA BERARI[1], TEODORA EVA LUPULESCU[1], RAMONA AMINA POPOVICI[2]

[1]West University "Vasile Goldis"Arad, Faculty of Medicine, Pharmacy and Dental Medicine
[2]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry
[3]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of General medicine

ABSTRACT

Periodontal disease has been associated with atherosclerosis, cardiovascular disease (CVD), diabetes, pre-term low birth weight, stroke, and premature death. Accordingly, periodontal disease may account for a portion of the risk for cardiovascular disease via a shared pathogenic underlying inflammatory response. The presence of inflammatory mediators from the liver, cause periodontal destruction and favor the appearance of endothelial atheromas. Periodontal pathogens are also able to invade the endothelium and atheromas; in fact, oral infection, being a source of bacteria, is associated with CVD.It also seems that periodontitis can influence some types of hypertension. Several studies have taken into consideration the relationship between hypertension and periodontitis, although an association between periodontal disease measures and incident hypertension in cohort studies has not yet been evidenced.In this review, we tried to explain how various pathologies can be related to and favor the onset of CVD and, especially, periodontitis.The role of dentists in the diagnosis, therapy, and management of metabolic patients is fundamental, but an improvement of collaboration among dentists, cardiologists, endocrinologists, nutritionists, etc., is needed.

Key words: *oral health, periodontitis, cardiovascular disease, atherosclerosis, hypertension*

Correspondence to:

Ramona Amina Popovici
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry, Splaiul Tudor Vladimirescu 14A
Phone: +4 0762006828
E-mail address: ramonaamina@yahoo.com

INTRODUCTION

Cardiovascular diseases (CVD) are a leading cause of morbidity and mortality in developed countries. The disease process that underlies the majority of cardiovascular events is atherosclerosis, an inflammatory disease of the blood vessel wall. The earliest physical evidences of atherosclerosis are fatty streaks, which are typically present in childhood. In the presence of arterial endothelial dysfunction, which is involved in the initiation and progression of atherosclerosis, these early lesions progress through to complex atheromatous lesions in adulthood, finally resulting in occlusion, plaque rupture and ischaemic events [1].

Periodontal disease has been associated with atherosclerosis [2], cardiovascular disease [3], diabetes [4], pre-term low birth weight [5], stroke [6], and premature death [7]. Accordingly, periodontal disease may account for a portion of the risk for cardiovascular disease via a shared pathogenic underlying inflammatory response (figure 1) [8].

Periodontal disease is inflammation of the tissues surrounding teeth and results from a complex interplaybetween bacteria and host risk factors such as long-term smoking, poor oral hygiene, poorly controlled diabetes, stress and genetic predisposition [9]. Not only have periodontal organisms adapted to survive within an environment that is constantly besieged by host defenses, but they flourish in the presence of inflammation, enabling their capacity to invade host tissues and gain direct access to the circulation [8]. Repeated bacteremias and endotoxemias are characteristic of periodontal infection, and periodontal organisms have been found to co-localize within atheromatous plaques [10]. The constant exposure of the vasculature to these pathogens provides an opportunity for endothelial inflammatory activation and functional impairment. Clinically, periodontal disease manifests as deepening of the epithelial attachment around teeth, loss of periodontal attachment and, ultimately, tooth loosening (figure 1).

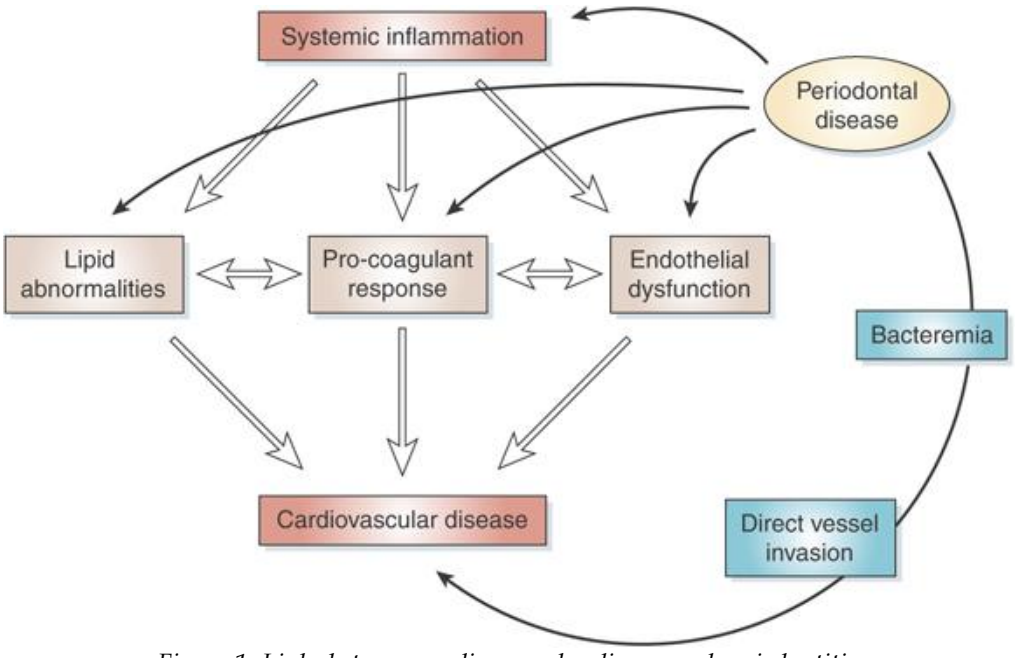


Figure 1. Links between cardio-vascular disease and periodontitis

PERIODONTITIS AND ATHEROSCLEROSIS

Periodontitis also contributes to atherosclerosis and CVD [11]. Periodontal pathogens draw lymphocytes in an attempt to stem infection through phagocytosis and killing, causing augmented production of ROS, which ends in a situation of oxidative stress. The presence of ROS promotes chemotaxis and recruits inflammatory mediators from the liver, causing periodontal destruction and favoring the making of endothelial atheromas. Periodontal pathogens are also able to invade the endothelium and atheromas; in fact, oral infection, being a source of bacteria, is associated with CVD [12]. There are several theories that attempt to explain the correlation between periodontitis and CVD [13].

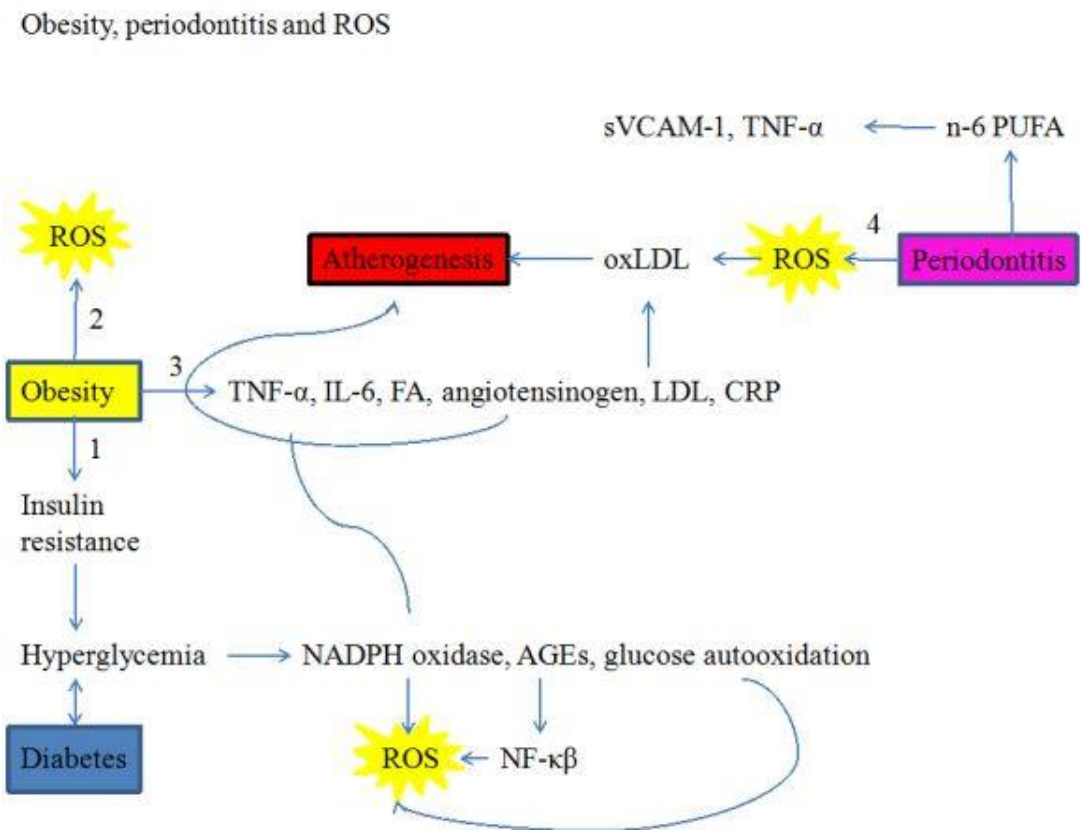


Figure 2. Conceptual model of periodontal disease and cardiovascular surrogate endpoint response

One theory is the bacteriological theory, according to which oral pathogens, such as P. gingivalis, invade the systemic circulation and by means of the virulence factors, such as fimbriae, are able to invade the atheromatous plaques. These bacteria can activate endothelialcells through TLR4 and induce apoptosis in these cells, disrupting the mechanisms of cell adhesion. The inflammatory theory holds that in the course of periodontitis, gingival cells produce inflammatory mediators such as TNF-α, IL-6, PGE-2, and MMPs that locally promote tissue destruction and, once in the circulation, stimulate endothelial cells to produce other mediators such as monocyte chemotactic protein (MCP-1), macrophage colony stimulating factor (MCSF), intercellular adhesion molecule (I-CAM), vascular cell adhesion molecule (V-CAM), P-selectin, and E-selectin. These cytokines accelerate the formation of atheroma. The third theory is the autoimmune theory, according to which antibodies against bacterial

antigens may also react against endothelial protein, causing their destruction and therefore the arterial lesion [13]. Systemic and local chronic inflammatory states, such as periodontitis, are characterized by an elevated presence of acute-phase proteins such as CRP and fibrinogen, which represent a decisive contribution to the insurgence of atherosclerosis and CVD [13]. Vice versa, the reduction of periodontal inflammation through plaque control, systemic antibiotics, scaling, and root planning seems to decrease CRP levels in patients reducing the risk of CVD [13].

Treating periodontal disease results in a functional improvement in cardiovascular status [14-17]. These studies are consistent with the concept that periodontal disease may be an important source of infectious and inflammatory vascular stress, and that periodontal therapy may be of particular clinical relevance in populations with high prevalence of both periodontal disease and cardiovascular disease.

PERIODONTITIS AND HYPERTENSION

It also seems that periodontitis can influence some types of hypertension [18]. Several studies have taken into consideration the relationship between hypertension and periodontitis, although an association between periodontal disease measures and incident hypertension in cohort studies has not yet been evidenced. In a sample of 31,543 participants of the Health Professionals' Follow-Up Study, based on a prospective cohort of 40- to 75-year-old men at baseline, with no prior hypertension history and complete baseline information on oral health, an incidence of 10.828 cases of hypertension over 20 years of follow-up was identified, with no significant association between incident hypertension and periodontal disease [19]. In a study population of 182 adults, a multivariate analysis showed no association between severe periodontitis and hypertension history (OR = 0.99; 95% CI: 0.40-2.48). Severe periodontitis was associated with high blood pressure, with an OR of 2.93 (95% CI: 1.25-6.84) after adjusting for age, gender, smoking, and binge drinking. This association was stronger when restricted to those with hypertension or taking antihypertensive medications (OR = 4.20; 95% CI: 1.28-13.80), suggesting that periodontitis may contribute to poor blood pressure control among older adults [20]. Although statistical evidence is lacking, a clinical relation between high blood pressure and aggressive periodontitis has been deduced, as patients with poor oral hygiene have higher blood pressure problems than do healthy subjects with good oral hygiene condition [19]. Regarding the biological mechanism of this relationship, a recent study evaluated endothelial function in patients with periodontitis. Circulating levels of CRP and IL-6 were significantly higher in the periodontitis subjects with hypertension, than in the control group. Periodontal therapy seems to reduce serum concentrations of CRP and IL-6 [21].

GOOD ORAL HEALTH

Maintaining good oral health is fundamental for individuals who have a tendency to develop CVD. Progressive loss of teeth produces a variation of diet, with an increased intake of foods with great caloric rate, saturated fats, "trans"fatty acids, and cholesterol, and less intake of fruits and vegetables rich in vitamins and fibers, folate, and potassium [22]. The use of partial or total removable prosthesis does not seem to cover the

masticatory efficacy of natural teeth [23], but fixed dental prosthetic devices and prosthetic overimplants seem to improve dietary practices [24]. Collateral drugs used in patients suffering from cardio vascular diseases may give rise to oral collateral effects and could interact with drugs prescribed in dentistry [25]. Sibutramine, used in weight control, may cause hypertension and tachycardia, and if associated with opioids, may provoke serotonin syndrome with confusion, palpitations, and loss of consciousness; the concomitant use of erythromycin and clarithromycin could lead to toxicity. Ace inhibitors, if prescribed in association with non-steroidal anti-inflammatory agents, may be inhibited in their activity. Statin medications in association with erythromycin and clarithromycin could lead to renal failure [18]. As diabetes is often associated with cardio-vascular problems, dentists may evaluate glycemic value before starting dental therapeutic measures [26]. The oral complications of diabetes are candidiasis, xerostomia, burning mouth syndrome, gingivitis, oral acute infections, and, clearly, periodontal diseases – all diseases treated with dentistry [27]. Therefore, the role of dentists in the diagnosis, therapy, and management of metabolic patients is fundamental [28], and an improvement of collaboration among dentists, cardiologists, endocrinologists, and nutritionists is needed to promote the multidisciplinary therapeutic approach to this syndrome.

CONCLUSIONS

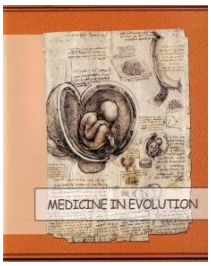
In this review, we tried to explain how various pathologies can be related to and favor the onset of CVD and, especially, periodontitis. Oxidative stress seems to be the chief suspect in ethiopathogenesis of periodontal disease; for this, the use of drugs with antioxidative activity or anti-AGE is the subject of research. Chemical agents such as pyridoxamine, metformin, and nefedipine, with their antioxidative ability, could be used. Other anti-AGE drugs are modified tetracyclines,such as doxycycline, which have anti-inflammatory and antioxidative effects. However, this argument needs more clarity, and the search for answers goes encouraged. As we await more results, we can increase prevention in at-risk individuals by advising lifestyle changes and prescribing a balanced diet to control body weight, hyperlipidemia, and hypertension; advising a stop to smoking and the maintenance good oral hygiene in periodontal therapy; and finally, establishing pharmacological and eating control of diabetes.

The role of dentists in the diagnosis, therapy, and management of cardio-vascularpatients is fundamental, but an improvement of collaboration among dentists, cardiologists, endocrinologists, nutritionists, etc., is needed.

REFERENCES

1. Pepine CJ: The effects of angiotensin-converting enzyme inhibition on endothelial dysfunction: potential role in myocardial ischemia. Am J Cardiol 1998, 82(10A):23S-27S.
2. Fifer KM, Qadir S, Subramanian S, Vijayakumar J, Figueroa AL, Truong QA, Hoffman U, Brady TJ, Tawakol A: Positron emission tomography measurement of periodontal (18)f-fluorodeoxyglucose uptake is associated with histologically determined carotid plaque inflammation. J Am CollCardiol 2011, 57(8):971-976.

3. Katz J, Marc H, Porter S, Ruskin J: Inflammation, periodontitis, and coronary heart disease. Lancet 2001, 358(9297):1998.
4. Thorstensson H, Hugoson A: Periodontal disease experience in adult long-duration insulin-dependent diabetics. J ClinPeriodontol 1993, 20(5):352-358.
5. Xiong X, Buekens P, Fraser WD, Beck J, Offenbacher S: Periodontal disease and adverse pregnancy outcomes: a systematic review. BJOG 2006, 113(2):135-143.
6. Joshipura KJ, Hung HC, Rimm EB, Willett WC, Ascherio A: Periodontal disease, tooth loss, and incidence of ischemic stroke. Stroke 2003, 34(1):47-52.
7. Soder B, Jin LJ, Klinge B, Soder PO: Periodontitis and premature death: a 16-year longitudinal study in a Swedish urban population. J Periodontal Res 2007, 42(4):361-366.
8. Offenbacher S, Elter JR, Lin D, Beck JD: Evidence for periodontitis as a tertiary vascular infection. J IntAcadPeriodontol 2005, 7(2):39-48. Van Dyke TE, Sheilesh D: Risk factors for periodontitis. J IntAcadPeriodontol 2005, 7(1):3-7.
9. Haraszthy VI, Zambon JJ, Trevisan M, Zeid M, Genco RJ: Identification of periodontal pathogens in atheromatous plaques. J Periodontol 2000, 71(10):1554-1560.
10. Offenbacher S, Madianos PN, Champagne CM, Southerland JH, Paquette DW, Williams RC, et al: Periodontitis-atherosclerosis syndrome: an expanded model of pathogenesis. J Periodont Res 1999, 34:346–352.
11. Libby P, Ridker P, Maseri A: Inflammation and atherosclerosis. Circulation 2002, 105:1135–1143.
12. Tonetti MS, D'Aiuto F, Nibali L, Donald A, Storry C, Parkar M, Suvan J, Hingorani AD, Vallance P, Deanfield J: Treatment of periodontitis and endothelial function. N Engl J Med 2007, 356(9):911-920.
13. D'Aiuto F, Parkar M, Nibali L, Suvan J, Lessem J, Tonetti MS: Periodontal infections cause changes in traditional and novel cardiovascular risk factors: results from a randomized controlled clinical trial. Am Heart J 2006, 151(5):977-984.
14. D'Aiuto F, Nibali L, Parkar M, Suvan J, Tonetti MS: Short-term effects of intensive periodontal therapy on serum inflammatory markers and cholesterol. J Dent Res 2005, 84(3):269-273.
15. Angeli F, Verdecchia P, Pellegrino C, Pellegrino RG, Pellegrino G, Prosciutti L, et al: Association between periodontal disease and left ventricle mass in essential hypertension. Hypertension 2003, 41:488–492.
16. Rivas-Tumanyan S, Spiegelman D, Curhan GC, Forman JP, Joshipura KJ: Periodontal disease and Incidence of Hypertension in the Health Professionals Follow-Up Study. Am J Hypertens 2012, 25(7):770–776.
17. Rivas-Tumanyan S, Campos M, Zevallos JC, Joshipura KJ: Periodontal Disease, Hypertension and Blood Pressure Among Older Adults in Puerto Rico. J Periodontol 2012.
18. Higashi Y, Goto C, Jitsuiki D, Umemura T, Nishioka K, Hidaka T, Takemoto H, Nakamura S, Soga J, Chayama K, Yoshizumi M, Taguchi A: Periodontal infection is associated with endothelial dysfunction in healthy subjects and hypertensive patients. Hypertension 2008, 51(2):446–453.
19. Krall E, Hayes C, Garcia R: How dentition status and masticatory function affect nutrient intake. JADA 1998, 129:1261–1269.
20. Morais JA, Heydecke G, Pawliuk J, Lund JP, Feine JS: The effects of mandibular two-implant overdentures on nutrition in elderly edentulous
21. Vernillo AT: Diabetes mellitus: relevance to dental treatment. Oral Surg Oral Med Oral Pathol Oral RadiolEndod 2001, 91:263–270.
22. Vernillo AT: Dental considerations for the treatment of patients with diabetes mellitus. JADA 2003, 134:24s–33s.



ASSESSING THE EFFECTIVENESS OF DIFFERENT METHODS OF ORAL HEALTH EDUCATION AND INFORMATION MATERIALS TO PRESCHOOL CHILDREN

IUSTIN OLARIU[1], RAMONA-AMINA POPOVICI[2], ATENA GALUSCAN[2], DANIELA JUMANCA[2], RUXANDRA SAVA-ROSIANU[2], ALIN MARINESCU[2], PAUL TICA[1], ANGELA CODRUTA PODARIU[2]

[1]University "Vasile Goldis"Arad, Faculty of Medicine, Pharmacy and Dental Medicine
[2]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry West

ABSTRACT

Health promotion is the process that gives individuals and organizations the opportunity to increase their control over the determinants of health and thereby to improve their health. Is a unifying concept for those who recognize the need for fundamental change in both lifestyle and standard of living World Health Organization (WHO) emphasizes (1986) that health is too important to be left only health practitioners, education and policy development must be focused on health development at the individual, community and national levels. The current generation of preschoolers is not only influenced by their social environment and teachers, but also by electronic gadgets, media, television, and cartoons. Health- Promoting Schools in the article: "An Opportunity for oral health promotion", is described like for oral health education program from Denmark, where at age 2.5 to 5 years is recommended songs, Puppet Theater, educational boards and playing a role on oral health to be undertaken lessons in kindergarten.

Key words: *oral health, oral health education, preschool children, means of education*

Correspondence to:

Angela Codruta Podariu
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry, Splaiul Tudor Vladimirescu nr. 14A
Phone: +4 0256204950
E-mail address: proiectetm@yahoo.com

INTRODUCTION

Health promotion is the process that gives individuals and organizations the opportunity to increase their control over the determinants of health and thereby to improve their health. Is a unifying concept for those who recognize the need for fundamental change in both lifestyle and standard of living. World Health Organization (WHO) emphasizes (1986) that health is too important to be left only health practitioners, education and policy development must be focused on health development at the individual, community and national levels. Behavior change theories such as Social Learning Theory [1] and the Health Belief Model [2] suggests that changes in knowledge, attitudes and behavior may be brought about using a concerted approach involving mass media, community, and individual interactions. [3] The effectiveness of media campaigns is enhanced when reinforced by individual interaction. A sustained behavior change regarding health can be created using a combined approach of media supported by a health professional input. Mass media has been accepted as one of vehicles for dental health education. [4] the decline in the prevalence of dental caries in most industrialized countries is attributed to changing life-styles, effective use of oral health services, and the implementation of school based oral health-care programs.

Oral diseases are among the most costly diseases on diet and lifestyle. Costs of treatment but tooth decay could easily exceed the total budget allocated to the health of children. However, their neglect costs would be high in terms of financial impact, socially and personally. Many oral health problems can be prevented and early damage may be reversible. However, in some countries there is a considerable number of children, their parents and teachers who have limited knowledge about the causes and prevention of oral diseases, but faced with limited access to dental treatment. Problems are exacerbated by eating sugary snacks and soft drinks, increased consumption among preschool children.

The current generation of preschoolers is not only influenced by their social environment and teachers, but also by electronic gadgets, media, television, and cartoons. Health-Promoting Schools in the article: "An Opportunity for oral health promotion"[5], is described like for oral health education program from Denmark, where at age 2.5 to 5 years is recommended songs, Puppet Theater, educational boards and playing a role on oral health to be undertaken lessons in kindergarten.

METHODOLOGY

In the study was taken 296 children aged 3 to 6 years, with a mean average age in group 1 was 4.35 ± 1.13 years and the average age of group 2 was 4.26 ± 1.068 years. The gender distribution was equal both age and batch. The distribution area was also equal batches and age groups.

Group 1 were conducted oral health education lessons using classical methods like: using the macro model to learn the teeth washing, Coloring dental layers, Coloring healthy food, healthy food sharing / unhealthy on a magnetic board, reading and puppet theater and reading fairy stories.

In group 2 were conducted oral health education lessons in kindergarten through play acting and also involving parents in their children

education plays on Palliative teeth. Thus kindergarten we played well the macro model, but we actually washing and teeth, I tried also to use dental floss, we played and plaster teeth for understanding the composition of the teeth, then I colored some tooth plates Montessori genre, then we colored teeth happy and sad tooth associated with healthy / unhealthy food. Finally I made a sketch tooth teeth happy sad and I watched an animated film on orthodontic hygiene, and gave homework to create a game on correct dental care with parents.

Figure 1. Playing association food with happy or sad tooth

Figure 2. Modeling by dough the oral cavity with the temporary teeth

Figure 3. Drawing the teeth structure on a Montessori style sketch

After 3 months we made the evaluations of knowledge's witch every child about oral health. After our lessons they had to know the number of temporary teeth, their name, the structure of a temporary tooth, healthy eating habits. Also we asked children what they liked most of all I wanted to do to learn about teeth and dental care The assessment method was by interviewing every child and to notice the questions and then created a database, witch finally we processed statistic.

RESULTS

At insertion all implants reached a In relation to the number of milk teeth normally existing in the oral cavity 77,08% of the batch components comparative test gave correct answer with only 39.58% of the components of the batch test, which represented in Figure 4. This difference is statistically significant, p = 0.001, resulting in that the method of information transmission in the test group were more effective.

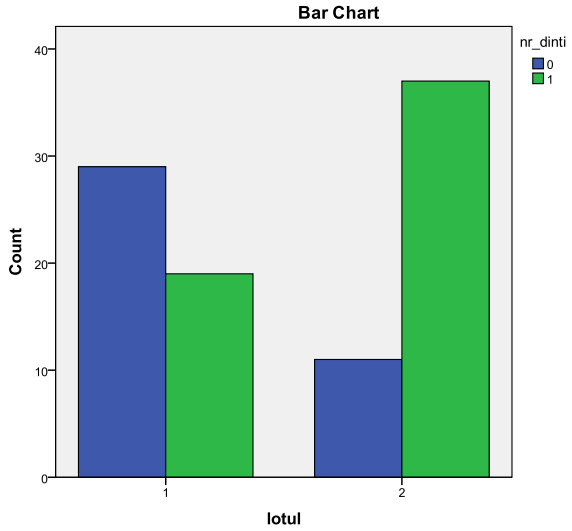


Figure 4 Distribution of response options to the question "How many milk teeth?"The two groups each consisting of 48 children each. Where group 1 = control group and test group 2 = group and nr of teeth = 1 is the correct answer, and 0 = incorrect answer

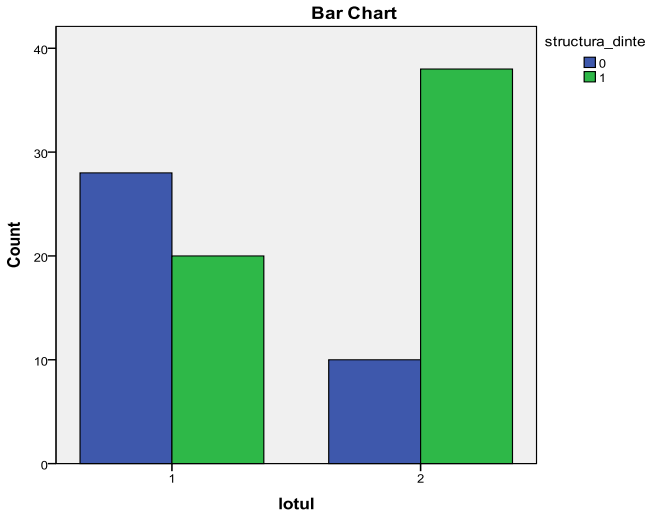


Figure 5. Distribution of response options to the question "What is the structure of milk teeth?"The two groups each consisting of 48 children each, where group 1 = control group and test group 2 = group and teeth structure 1 is the correct answer and 0 = incorrect answer

The structure of a tooth 79, 16% of the batch test ingredients answered correctly, compared with only 41.16% of the components control group, the difference was statistically significant, p = 0.03. Thus we can say that the way to provide information about dental structure used in the test group was significantly more effective than the one used in the control group.

Regarding to recognition of healthy children's food of the test group it was recognized at a rate of 72, 91% of children in contrast to the control group which only 50 per cent correct answers. This difference was statistically significant (p = 0.01), resulting in the methods of presentation of this information was more efficient to batch test components.

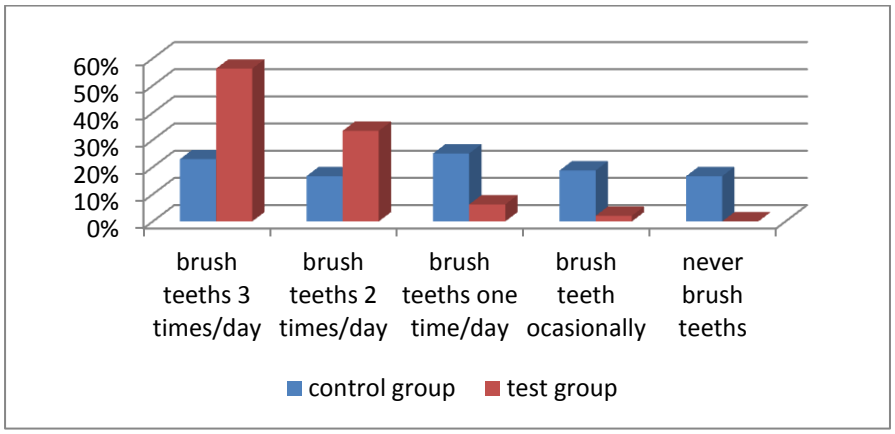


Figure 6. Distribution of response options to the question "How often do you brush your teeth?"The two groups each consisting of 148 children each. (Occasionally it was considered less than once per day), where group 1 = control group and group 2 = group test

The hygiene practices and skills were as follows: 56% of children in the test group states that carry brushing three times a day, as opposed to only 23 % of students in the control group, 33 % of children and 17 % of the batch test control group children performed brushing teeth twice daily, 6% of children in the test group and 25 % of children in the control group performed brushing once a day, 2% of children in the test group and 19% of children in the test group brush their teeth occasionally, and 17 % of children in the control group also states that not brushing never performed. The differences were statistically significant (p = 0.001) between the healthy oral health habits the two groups studied.

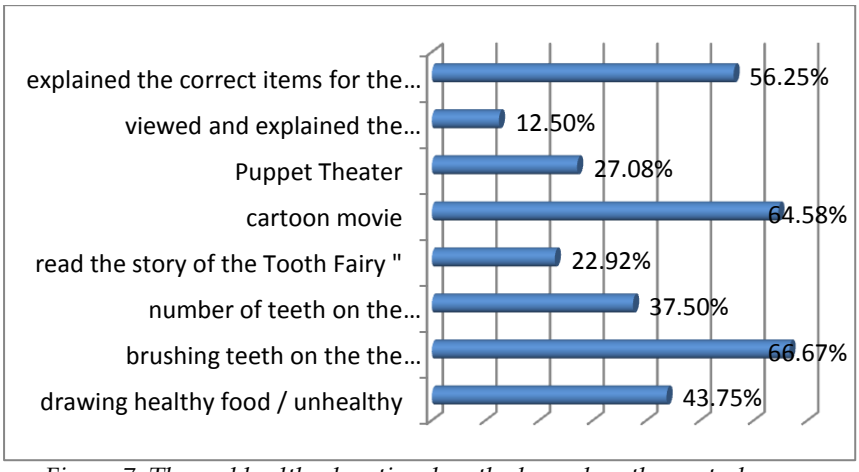


Figure 7. The oral health educational methods used on the control group

In the methods of oral health education for children in the control group used we can say that the most successful explanation had tooth brushing and playing with macro model 69 %, followed by the cartoon at the rate of 67 %, then captivated describing objects needed dental care fair play to them (56%). 44 % of the children were captivated by drawing too healthy or unhealthy food on plates with all kinds of food, and 38% also said that they loved and counting the number of teeth from the macro model as such have practiced. The least exciting moments have been viewed and explained the components of a tooth, only 27 % of children have loved this activity and only 13 % said they liked the puppet theater designed by me. (see Figure 7).

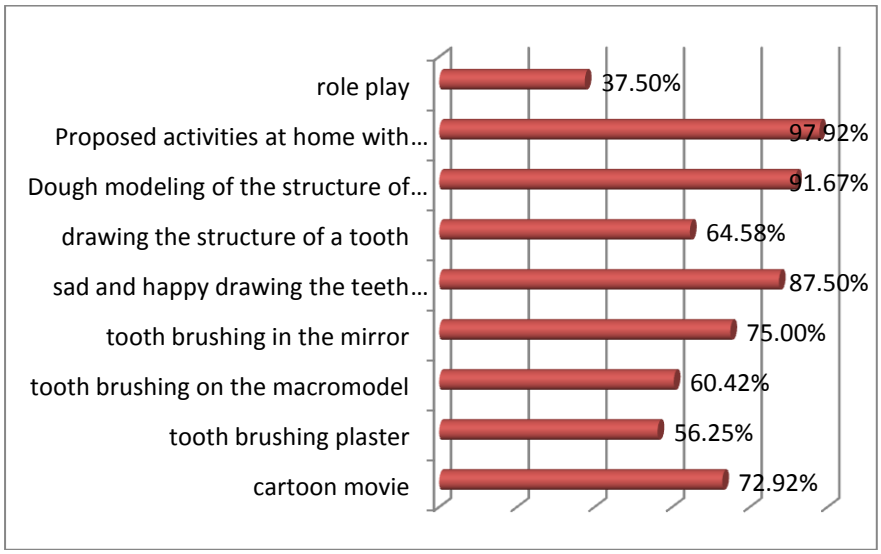


Figure 8. The oral health educational methods used on the control group

Regarding the methods of oral health education for children in the test group used, we can say that the most successful in our proposal had to do a project at home with their parents and then bringing it to kindergarten 98 %, followed by modeling of dough to 92 % of tooth structure, then sad and happy tooth fairy drawing by food consumed 88%. Regarding brushing steps suggested he liked best the third stage when they brushed themselves % in front of the mirror 75, followed by brushing the macro model 65 % and then to 56% of one tooth brushing. Viewing a cartoon was loved by 72% of children from the second group, but only 38 % have loved role play set. (See Figure 8)

From the graphs 8 and 9 results that the subjects from the test group were more enthusiastic than those in the control group, thanks to the most exciting game, but also the way of relationship with the person with teaching them. Transmitting educational messages were made significant statistically better p = 0.03 from among the children on the floor, rather than from the front of a desk.

CONCLUSIONS

When are preparing informational materials for the preschoolers children, it's should consider the following:

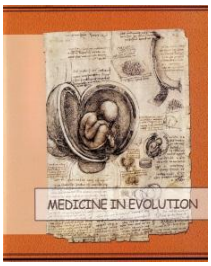
- Flyers and posters are not efficient, no matter how colorful or how is formulated the educational messages;

- Learning from logic games designed specifically for children is more educational than an educational slide presentation;
- Association sad and happy expressions on teeth with healthy or unhealthy food gives better results at preschoolers than showing with pictures with healthy food and unhealthy food, or drawing a alimentation pyramid ;
- By involving the parents in educational activities helps in better assimilation of knowledge and to a better oral hygiene;
- Drawing teeth are more educational in the Montessori style than classical;
- Preschool children do not relate well with doctors so oral health education should take place in a he kindergarten or in a meeting with mothers and children group;
- Presentation of educational materials on the floor, that among the children help to a better cooperation of preschool children
- Games that include palpation things helps better understanding of spatiality and the settlement of the teeth, as well as understanding the structure of the oral cavity;
- The cartoons are educative for children, if they don't have a lot of information and are short less than 30 minutes;
- Role plays are hardly to understood by preschool children (3-4 years);
- Learning the correct tooth brushing is easier to understand if it is in three stages: one tooth brushing plaster it on all sides, then the macro model, or a colleague, and the last stage is the mirror with the teacher or a parent.

REFERENCES

1. Bandura A. Social Learning Theory. Englewood Cliffs, NJ: Prentice Hall; 1977. p. 247.
2. Rosenstock IM, Strecher VJ, Becker MH. Social learning theory and the health belief model. Health Educ Q 1988; 15:175-83.
3. Bakdash MB, Lange AL, McMillan DG. The effect of a televised periodontal campaign on public periodontal awareness. J Periodontol 1983; 54:666-70.
4. Schou L. Use of mass-media and active involvement in a national dental health campaign in Scotland. Community Dent Oral Epidemiol 1987; 15:14-8.
5. World Health Organization. „Oral Health Promotion: An Essential Element of a Health Promoting School." WHO Information series on school health. Document eleven, Geneva, 2003.

STRATEGIES IN ORAL DISEASE PREVENTION AND ORAL HEALTH PROMOTION



ALIN MARINESCU[1], ANGELA CODRUTA PODARIU[1], DANIELA JUMANCA[1], ATENA GALUSCAN[1], RUXANDRA SAVA-ROSIANU[1], IUSTIN OLARIU[2], PAUL TICA[2], RAMONA-AMINA POPOVICI[1]

[1]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry
[2]West University "Vasile Goldis"Arad, Faculty of Medicine, Pharmacy and Dental Medicine

ABSTRACT

Oral health is an integral element of general health and wellbeing. Good oral health enables individuals to communicate effectively, to eat and enjoy a variety of foods, and is important in overall quality of life, self-esteem and social confidence. However, oral diseases affect a significant proportion of the world's population and exact a heavy toll in terms of morbidity and mortality. Oral diseases are however largely preventable. The challenge is to create the opportunity and conditions to enable individuals and communities to enjoy good oral health. Although advances in clinical operative techniques have made dental treatment more effective and acceptable, treatment approaches alone will never eradicate oral diseases. Indeed in many low-income countries in the developing world, the total costs of providing traditional operative dental care would exceed the entire health care budget. Effective public health approaches are therefore required to prevent oral diseases and promote oral health across the population. The aim of this paper is to outline public health strategies to promote oral health and reduce inequalities. An overview of the Ottawa Charter and other public health policy frameworks developed by WHO is presented. The evidence base for preventive interventions for oral disease is then summarized. The principles underlying oral health strategies are outlined, and finally some case studies are presented to illustrate the approaches recommended.

Key words: *Oral health, Oral health promotion, prevention, quality of life*

Correspondence to:

Ramona Amina Popovici
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry, Splaiul Tudor Vladimirescu 14A
Phone: +4 0762006828
E-mail address: ramonaamina@yahoo.com

INTRODUCTION

Oral health is an integral element of general health and wellbeing. Good oral health enables individuals to communicate effectively, to eat and enjoy a variety of foods, and is important in overall quality of life, self-esteem and social confidence (*1*). However, oral diseases affect a significant proportion of the world's population and exact a heavy toll in terms of morbidity and mortality (*2*). A range of diseases and conditions can be classified as oral diseases including dental caries, periodontal diseases, oral cancers, noma, dental erosion and dental fluorosis. Oral diseases are highly prevalent and their impact on both society and the individual is significant. Pain, discomfort, sleepless nights, limitation in eating function leading to poor nutrition, and time off school or work as a result of dental problems are all common effects of oral diseases.

Although overall improvements in oral health have occurred in many developed countries over the last 30 years, oral health inequalities have emerged as a major public health challenge because lower income and socially disadvantaged groups experience disproportionately high levels of oral disease (*2*). In many developing countries economic, social and political changes have had a significant effect on diet and nutrition with a shift occurring from traditional towards more "westernized" diets (*3*). As a consequence the consumption of sugars has risen and levels of dental caries have increased (*2*). This is a particular problem in the primary dentition in which most caries remain untreated. In some parts of the developing world, oral cancers and noma are a significant cause of premature death and extreme disability. The biggest recent changes in European oral healthcare were found to have occurred in Eastern Europe, where there has been wide scale privatization of the previously public dental services. However, most of the Eastern European states seemed to be slowly developing insurance systems to cover oral health treatment costs.

In developing countries, oral health services are mostly offered from regional or central hospitals of urban centers and little, if any, importance is given to preventive or restorative dental care. Many countries in Africa, Asia and Latin America have a shortage of oral health personnel and generally the capacity of the systems is limited to pain relief or emergency care. In Africa, the dentist to population ratio is approximately 1: 150 000 against about 1: 2000 in most industrialized countries

Oral diseases are however largely preventable. The challenge is to create the opportunity and conditions to enable individuals and communities to enjoy good oral health. Although advances in clinical operative techniques have made dental treatment more effective and acceptable, treatment approaches alone will never eradicate oral diseases. Indeed in many low-income countries in the developing world, the total costs of providing traditional operative dental care would exceed the entire health care budget (*4*). Effective public health approaches are therefore required to prevent oral diseases and promote oral health across the population. The aim of this paper is to outline public health strategies to promote oral health and reduce inequalities. An overview of the Ottawa Charter and other public health policy frameworks developed by WHO is presented. The evidence base for preventive interventions for oral disease is then summarized. The principles underlying oral health strategies are outlined, and finally some case studies are presented to illustrate the approaches recommended.

METHODS

A collection of published information sources was used as reference material for this paper. A series of WHO policy reports and reviews provided valuable guidance on the public health principles underpinning the development of oral health strategy. A range of Cochrane and other systematic reviews that have assessed the effectiveness of oral health interventions are summarized below. In addition, key publications on oral health and a collection of international case-studies have been used to provide practical details of the public health approaches used to promote oral health.

In recognition of the limited ability of health education and clinical prevention to produce sustainable improvements in health and to reduce inequalities, WHO organized an international conference in Canada in 1986 to develop a more radical public health approach to prevention. Following the discussions at this conference the Ottawa Charter was published to provide a set of guiding principles for health promotion (*5*).

The Ottawa Charter defined health promotion as: "The process of enabling individuals and communities to increase control over the determinants of health and thereby improve their health. Health promotion represents a mediating strategy between people and their environment, combining personal choice and social responsibility for health to create a healthier future"(*5*).

Five key areas of health promotion action are outlined in the Charter:

1. *Promoting health through public policy*: by focusing attention on the impact on health of public policies from all sectors, not just the health sector.
2. *Creating supportive environments*: by assessing the impact of the environment and clarifying opportunities to make changes conducive to health.
3. *Developing personal skills*: by moving beyond the transmission of information, to promote understanding and to support the development of personal, social and political skills which enable individuals to take action to promote their health.
4. *Strengthening community action*: by supporting concrete and effective community action in defining priorities, making decisions, planning strategies and implementing them to achieve better health.
5. *Reorienting health services*: by refocusing attention away from the responsibility to provide curative and clinical services towards the goal of achieving health gain.

WHO from 2003 recommend fluoridated toothpaste because is a highly effective means of caries control; every effort must be made to develop affordable fluoridated toothpastes for use in developing countries. The use of fluoride toothpastes being a public health measure, it would be in the interest of countries to exempt them from the duties and taxation applied to cosmetics.

RESULTS

In recent years, in line with the evidence-based movement in clinical dentistry, the effectiveness of preventive interventions has been scrutinized to determine which interventions are effective and which are not. Table 1 summarizes the findings of a range of reviews of the

effectiveness of preventive measures for improving oral health. As can be seen from Table 1, the most significant limitation of these largely clinical and educational interventions is that they fail to achieve sustainable improvements in oral health as the campaign are palliative in nature and largely ignore the underlying factors that create poor oral health. As a result, inequalities, rather than being reduced, may indeed be increased because those with more resources are able to benefit the most from the interventions delivered (*27*). These problems are not unique to dentistry. Reviews of the evidence base for a wide range of topic areas have highlighted the limitations of the clinical preventive approach (*28*).

Table 1 Evidence base summary of oral health intervention

Topic	Reference	Review type	Summary findings
Water fluoridation	Locker 1999 (10) McDonagh et al 2000 (11)	Systematic reviews	Quality of studies low to moderate Estimated caries preventive effect – 14% reduction Effect tends to be greatest in primary dentition
Topical fluorides	Marinho et al 2002 (12) Marinho et al 2002 (13) Marinho et al 2003 (14) Marinho et al 2003 (15) Marinho et al 2003 (16) Marinho et al 2004 (17) Marinho et al 2004 (18)	Cochrane review	Specific reductions in caries rates were estimated to be 24% for fluoride toothpaste. 26% for mouth rinses, 28% for gels and 46% for varnishes. Overall estimate of benefits was 26% in permanent definition and 33% in primary dentition.
Fissure sealants	Ahouvuo- Saloranto et al 2004 (19)	Cochrane review	Caries reductions ranging from 86% at 12 months to 57% at 48 months were achieved. The level of effectiveness is dependent upon the baseline caries rate.
Dental health education	Brown 1994 (20) Schou & Locker 1994 (21) Kay & Locker 1996 (22) Sprod et al 1996 (23) Kay & Locker 1997 (24)	Effectiveness review	Majority of interventions health education in nature Short term improvements in oral health knowledge achieved, but effects on behavior and clinical outcomes limited. Provision of health information alone did not produce long-term behavior changes. School- based tooth brushing campaigns ineffective at improve oral hygiene No evidence on effectiveness of dietary interventions to reduce dental caries. Mass media campaigns are ineffective at promoting either knowledge or behavior change Study design and evaluation quality generally poor.

Topic	Reference	Review type	Summary findings
Periodontal health	Watt & Marihno 2005 (25)	Systematic reviews	Interventions all involved health education Short-term reductions in plaque and gingival bleeding achieved in many studies. Clinical and public health significance of these changes questionable Evaluation quality generally poor
Screening for oral cancer	Kujon et al 2003 (26)	Cochrane review	Very few high- quality studies were identified One randomized controlled trial found no difference in age-standardized oral cancer mortality rates for screened group No evidence to support or refute the use of visual examination or other methods of screening for oral cancer.

Largely through the influence of WHO, a public health approach to disease prevention and health promotion has emerged as the dominant strategy for combating no communicable diseases worldwide (*29*). The WHO Global Oral Health Programme has adopted this approach as the best means of promoting oral health and reducing inequalities within and between countries (*2*). Details of the underlying principles of this public health approach are given below.

Based upon a biomedical model of disease, oral health professionals have traditionally focused preventive and educational action on altering those behaviors which were seen to be the cause of dental diseases. This "lifestyle"approach has dominated preventive practice across the world for many decades (*30*). The underlying theory behind this approach is that once individuals acquire the relevant knowledge and skills, they will then alter their behavior to maintain good oral health.

The assumptions underlying this narrow and reductionist approach are fundamentally flawed. Firstly, human behavior is extremely complex. Knowledge gain alone rarely leads to sustained changes in behavior (*23*). Secondly, it is incorrect to assume that lifestyles are freely chosen and can be easily changed by everyone. Health knowledge and awareness are of little value when resources and opportunities to change do not exist. People's behaviors are enmeshed within the social, economic and environmental conditions under which they are living (*31*). Although behaviors and lifestyles undoubtedly have some influence on health, it is essential to understand the broader context which determines patterns of behavior (*32*) (Fig. 1).

Source: Dahlgren G, Whitehead M. Tackling inequalities in health: what can we learn from what has been tried? Background paper for "*The King's Fund International Seminar on Tackling Health Inequalities*". Ditchely Park, Oxford: King's Fund; Reproduced with permission of the authors. WHO 05.111

Figure 1. Social determinants of health

Based upon an analytical framework developed from a social model of health, the broader context determining behavior becomes apparent. For example, individual behaviors such as oral hygiene practices, dietary patterns and attendance for dental care are largely influenced by family, social and community factors, as well as political and economical measures. Indeed social science and public health research now recognize the underlying importance to health and disease of psychosocial, economic, political and environmental factors (*28*, *32*). Collectively these are known as the social determinants of health (*33*, *34*). Public health strategies therefore need to be directed at the underlying determinants, *the causes of the causes* (*35*, *36*).

One of the major criticisms of clinical preventive measures and dental health education has been the narrow, isolated and compartmentalized approach adopted, essentially separating the mouth from the rest of the body. All too often oral health campaign have been developed in isolation from other health initiatives. This uncoordinated approach at best leads to duplication of effort, but in fact often results in conflicting and contradictory messages being delivered to the public. The common risk approach recognizes that chronic no communicable diseases such as obesity, heart disease, stroke, cancers, diabetes, mental illness and oral diseases share a set of common risk conditions and factors (*32*, *37*) (Fig. 2). Unhealthy conditions largely determine risk behaviors. For example a poor-quality diet, tobacco smoking, inadequate hygiene, stress and trauma are factors linked to the development of several chronic conditions including oral diseases (*2*, *37*, *38*).

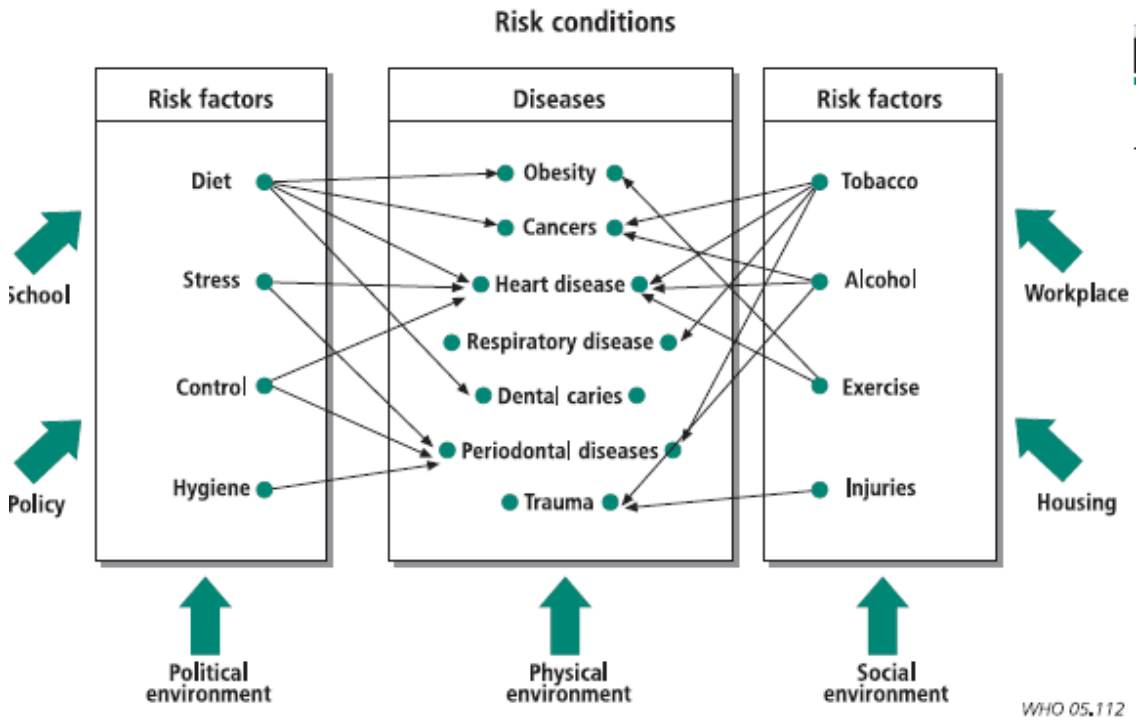


Figure 2. Common risk approach. Modified from Sheiham & Wat (2000)

The key concept of the integrated common risk approach is that by directing action towards these common risks and their underlying social determinants, improvements in a range of chronic conditions will be achieved more efficiently and effectively (*2*, *29*, *39*). The common risk approach provides a rationale for partnership working and is particularly applicable in countries with limited numbers of oral health personnel.

Geoffrey Rose in his seminal public health text, *The strategy of preventive medicine*, described two basic types of preventive approach, the high-risk and the population approach (*35*). The high-risk approach aims to focus attention on individuals at high risk who have been identified through screening tests. To be effective, the screening test must have an acceptable level of sensitivity, specificity and predictive power. Once identified, the high-risk individuals at the tail end of the disease distribution are then offered preventive support in an attempt to modify the course of the condition. This approach is very popular with many health professionals as it fits well with a clinical approach to prevention. However from a public health perspective the high-risk approach has certain recognized limitations (*40*, *41*). It is palliative in nature in that action is not directed at the underlying determinants of disease, new high-risk individuals will therefore constantly be emerging. The predictive power of available screening tests is limited and the approach ignores the majority of the population in whom most cases of disease occur. According to Beaglehole & Bonita (*42*) "the high-risk approach to primary prevention has overshadowed the more important population approach".

In the population approach, public health measures are implemented to reduce the level of risk in the whole population, shifting the whole distribution to the left (*35*). This more radical approach aims to address the underlying causes of disease across the whole population. Another option, known as the targeted or directed population approach, involves focusing action on higher risk groups or subpopulations. Screening methods are not used to identify the higher risk groups. Instead epidemiological

and/or sociodemographic data are used to define a particular subpopulation.

In the prevention of oral diseases the high-risk approach has been largely dominant. It is now increasingly acknowledged that a combination of the high-risk and directed population approaches is the best option (*2*, *29*, *35*, *42*).

Unhealthy dietary habits, smoking and other tobacco use, alcohol consumption and stress are some of the common risk factors for many NCDs, including oral health. The Global Oral Health Programme is ideally placed within the NPH at headquarters to enable effective execution of the common risk factor approach in disease prevention and health promotion.

While there has been encouraging improvement in oral health in many countries over the past few decades, much work remains to be done. With many challenges ahead, it is important to build on our achievements, and on strategies that work.

The guiding principles of the Ottawa Charter for Health Promotion (adopted in 1986) form a valuable platform for this work, while acknowledging the important prerequisites for health and well-being. Since then, a number of developments have underlined the relevance and

importance of key strategies in health promotion, including healthy public policy at a conference in Adelaide in 1988 and supportive environments for health in Sundsvall in 1991.

The Jakarta conference in 1997 further reiterated the five key action areas of the charter as the way forward, leading health promotion into the 21st century. Some countries should reorient their existing investments in health, to reflect the varying needs of a diverse population.

A key element of health promotion is the development and implementation of a range of complementary strategies to promote health (*5*). It is now widely recognized that clinical preventive and educational approaches alone can achieve only limited short-term effects, and may indeed widen health inequalities (*27*). Rather than relying solely on preventive and health education campaign targeted at high-risk individuals, a mix of complementary public health approaches is required which focus both on assisting individuals and communities to avoid disease and on the creation of supportive environments conducive to sustained good health. Policy development, organizational change, community action and legislation are all approaches that can be used to prevent oral diseases. In combination these strategies should address the broader social determinants of oral health.

Traditionally schools have been the main setting for oral health interventions (*30*), but a range of other settings can also be used. For example nurseries, youth centers, colleges, workplaces, places of worship and community centers may provide suitable settings in which to target defined population groups. In addition, rather than focusing solely upon influencing the general public, it may be more useful to target action at decision-makers and influential individuals in the local community. For example working with head teachers, local politicians or community representatives may lead to significant and sustainable change.

Based upon the actions outlined in the Ottawa Charter (*5*), a selection of case-studies from both developed and developing countries is presented below. These illustrate the different strategies to promote oral health that can be implemented in diverse locations. In many parts of the developing world, the prevalence of oral diseases and of many other chronic conditions are increasing (*2*, *29*). In view of the very limited

resources available for treatment, effective public health action is urgently needed. Isolated clinical preventive measures and educational campaign will have a minimal impact and be wasteful of scarce resources. Joint action in combating the common risks to general and oral health is needed.

Tobacco use adversely affects general and oral health, and is a significant global public health problem. Dentists and their teams are ideally placed to provide advice on smoking cessation, to offer support to smokers and to become actively involved in broader tobacco control policies (*2*). For many years, in several countries, smoking cessation initiatives have been developed for use in dental practices (*43*). A range of barriers have however hindered major progress in this important area of prevention.

Vic Health in Australia has developed a wide range of innovative and progressive public health campaign. Their Oral Health Strategy has adopted many elements of the Ottawa Charter and was developed on the basis of a thorough review of the evidence base (*44*). The strategy outlines detailed examples of a range of oral health policies, together with clear guidance on the roles and responsibilities of different partners.

The WHO Health Promoting Schools Initiative has encouraged the development of holistic action to improve the physical and social environment, curriculum and ethos in schools. A health promoting school can be characterized as a school that is constantly strengthening its capacity as a healthy setting for living, learning and working. In the city of Curitiba in southern Brazil, the local government has developed a range of healthy public policies including a health promoting schools network. A detailed evaluation of the impact of this approach on oral health revealed positive effects on levels of dental caries and orofacial trauma among the children attending schools with supportive policies (*45*).

Scottish children have one of the highest levels of caries experience in Europe. To address this problem a randomized controlled trial was undertaken to assess the efficacy of supervised tooth brushing in schools. The innovative element of the campaign was the delivery of the intervention by local mothers who volunteered to supervise tooth brushing (*46*). A significant mean reduction in caries increment was found in the test groups when compared with the controls.

The national Thai Health Promotion Foundation has supported and encouraged a variety of community initiatives to empower the community and foster participation in health campaign. In Chiang Mai, in the north of Thailand, rural oral health outreach campaign have been established in which the local community is actively engaged in efforts to promote better oral health (*47*). The dental faculty in Chiang Mai is also developing the concept of a health promoting dental school. One of the aims of this campaign is for dental students to engage with the wider community in activities for the promotion of oral health.

Based upon WHO guidance on the development and evaluation of public health policy (*48*), the following set of criteria are presented as a framework within which to assess the quality of oral health strategies:

- *Empowering:* oral health strategies should enable individuals and communities to assume more power over the personal, socioeconomic and environmental factors that affect their oral health.
- *Participatory:* oral health professionals should encourage the active involvement of key stakeholders in the planning, implementation and evaluation of oral health strategies.

- *Holistic:* oral health initiatives should foster physical, mental and social health, and focus upon the common risks and conditions that influence both general and oral health.
- *Intersect oral:* Oral health professionals should collaborate with the relevant agencies and sectors to place oral health upon a wider agenda for change.
- *Equity:* Oral health policies should be guided by a concern for equity and social justice and should ensure that inequalities in oral health are addressed where possible.
- *Evidence base:* Oral health interventions should be developed on the basis of existing knowledge of effectiveness and good practice.
- *Sustainable:* Oral health policies should bring about changes that individuals and communities can maintain and sustain once initial funding has ended.
- *Multi-strategy:* Oral health strategies should use a combination of approaches, including policy development, organizational change, community development, legislation, advocacy, education and communication to promote improvement in oral health.
- *Evaluation:* Sufficient resources and appropriate methods should be directed towards the evaluation and monitoring of oral health strategies. Both process and outcome evaluation measures should be used.

CONCLUSIONS

Oral health campaign tend to concentrate on individual behavior change and largely ignore the influence of socio-political factors as the key determinants of health. The common risk factor approach can be implemented in a variety of ways. Food policy development and the Health Promoting Schools initiative are used as examples of effective ways of promoting oral health

Future improvements in oral health and a reduction in inequalities in oral health are dependent upon the implementation of public health strategies focusing on the underlying determinants of oral diseases. A range of complementary actions delivered in partnership with relevant agencies and the local community are needed.

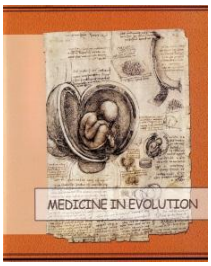
Clinical prevention and health education alone will not achieve sustainable improvements in oral health. In addition these approaches are very costly and are dependent upon the availability of appropriately trained oral health personnel. In both developed and developing countries public health strategies based upon the common risk approach are more likely to be effective in achieving significant oral health gains.

Healthy public policies are fundamental to improving access, promoting equity and creating supportive environments. Public accountability for health can be a driving force for change, a vital element in the advancement of healthy public policies. In order to build effective partnerships for health development and to form healthy alliances, global, national and local commitment is critical

REFERENCES

1. Locker D. Measuring oral health: a conceptual framework. *Community Dental* Health 1988;5:3-18.
2. Petersen PE. The World Oral Health Report 2003. Continuous improvement of oral health in the 21st century – the approach of the WHO Global Oral

Health Programme. *Community Dentistry and Oral Epidemiology* 2003;31 Suppl 1:3-24.
3. Drewnowski A, Popkin B. The nutrition transition: new trends in the global diet. *Nutrition Review* 1997;55:31-43.
4. Yee R, Sheiham A. The burden of restorative dental treatment for children in third world countries. *International Dental Journal* 2002;52:1-9.
5. WHO. *The Ottawa Charter for Health Promotion.* Geneva: World Health Organization; 1986.
6. WHO. *Adelaide recommendations on healthy public policy.* Geneva: World Health Organization; 1988.
7. WHO. *Sundsvall statement on supportive environments for health.* Geneva: World Health Organization; 1991
8. WHO. *Jakarta Declaration: new players for a new era.* Geneva: World Health Organization; 1997.
9. WHO. *Mexico Ministerial Statement: bridging the equity gap.* Geneva: World Health Organization; 2000.
10. Locker D. *Benefits and risks of water fluoridation.* Toronto: Ontario Ministry of Health; 1999.
11. Marinho VC, Higgins JP, Logan S, Sheiham A. Fluoride varnishes for preventing dental caries in children and adolescents. *Cochrane Database of Systemic Reviews* 2002a;(3):CD002279.
12. Marinho VC, Higgins JP, Logan S, Sheiham A. Topical fluoride (toothpastes, mouthrinses, gels or varnishes) for preventing dental caries in children and adolescents. *Cochrane Database of Systemic Reviews* 2003b;(4):CD002782
13. Ahovuo-Saloranta A, Hiiri A, Nordblad A, Worthington H, Mäkelä M. Pit and Fissure sealants for preventing dental decay in the permanent teeth of children and adolescents. *Cochrane Database of Systemic Reviews* 2004;(3): CD001830.
14. Brown L. Research in dental health education and health promotion: a review of the literature. *Health Education Quarterly* 1994;21:83-102.
15. Schou L, Locker D. *Oral health: a review of the effectiveness of health education and health promotion.* Amsterdam: Dutch Centre for Health Promotion and Health Education; 1994.
16. Kay L, Locker D. Is dental health education effective? A systematic review of current evidence. *Community Dentistry and Oral Epidemiology* 1996;24:231-5.
17. *Global strategy for the prevention and control of noncommunicable diseases.* Geneva: World Health Organization; 2000.
18. Towner E. The history of dental health education: a case study of Britain. In: Schou L, Blinkhorn A, editors. *Oral health promotion.* Oxford: Oxford University Press; 1993.
19. Graham H. Behaving well: women's health behaviour in context. In: Roberts H, editor. *Women's health counts.* London: Routledge; 1990.
20. Marmot M, Wilkinson R. *Social determinants of health.* Oxford: Oxford University Press; 1999.
21. Newton JT, Bower EJ. The social determinants of oral health: new approaches to conceptualising and researching complex causal networks. *Community Dentistry and Oral Epidemiology* 2005;33:25-34.
22. Rose G. *The strategy of preventive medicine.* Oxford: Oxford University Press; 1992.
23. Sheiham A. Improving oral health for all: focusing on determinants and conditions. *Health Education Journal* 2000;59:351-63.
24. *Risk factors and comprehensive control of chronic diseases.* Geneva: World Health Organization; 1980.
25. Grabauskas V. Integrated programme for community health in non communicable disease (Interhealth). In: Leparski E, editor. *The prevention of non communicable diseases: experiences and prospects.* Copenhagen: WHO Regional Office for Europe; 1987.
26. Phantumvanit P. Community care model for oral health in Thailand. In: *Evaluation of community based oral health promotion and oral disease prevention.* Geneva: World Health Organization; 2004.
27. *Health promotion evaluation: recommendations to policy makers.* Copenhagen: WHO Regional Office for Europe; 1998.



A COMPARATIVE STUDY ON EARLY ORTHODONTIC TREATMENT IN CLASS II MALOCCLUSIONS BY THE TRAINER SYSTEM VERSUS TREATMENT WITH REMOVABLE ORTHODONTIC APPLIANCES

RAMONA AMINA POPOVICI[1], MARCEL MOJSE[1], MARIANA PACURAR[2], MELINDA ONET[3], LIGIA VAIDA[4], ANA MARIA POPOVICI MUT[4], ANGELA CODRUTA PODARIU[1]

[1]University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry
[2]University of Medicine and Pharmacy Tg. Mures, Faculty of Dentistry
[3]West University „Vasile Goldis"Arad, Faculty of Medicine, Pharmacy and Dental Medicine
[4]University of Oradea, Faculty of Medicine and Pharmacy, Dental Medicine II

ABSTRACT

Functional appliances have been reported since early in the past century to produce skeletal and dentoalveolar changes. The aim of this study was to highlight the benefits and the positive effects that myofunctional interceptive orthodontic treatment has in combating problems that interfere and negatively influence growth and harmonious development of the jaws in children. Also, what is the importance and the consequences of applying a mixed interceptive orthodontic treatment (functional and mechanical) to improve early signs and symptoms of malocclusion.

Key words: *Functional appliances, myofunctional interceptive orthodontic treatment, malocclusion, children*

Correspondence to:

Angela Codruta Podariu
Address: University of Medicine and Pharmacy "Victor Babes"Timisoara, Faculty of Dentistry, Splaiul Tudor Vladimirescu 14A
Phone: +4 0256204950
E-mail address: ramonaamina@yahoo.com

INTRODUCTION

Functional appliances have been reported since early in the past century to produce skeletal and dentoalveolar changes. [1, 2, 3, 4] The skeletal effect of these appliances appears to result from various phenomena: remodeling and relocation of the glenoid fossa, accelerated and enhanced condylar growth and neuromuscular adaptation. [4, 5, 6]

Myofunctional therapy, also called orofacial myofunctional therapy, is the neuro-muscular re-education or re-patterning of the oral and facial muscles. It might include muscle exercises, which create a normal freeway space dimension.[7, 8, 9, 10]

Myofunctional appliances have been used for many years. There is a definite place for these appliances in orthodontics today because they are simple and economical, but the cases need to be carefully selected, and the operator needs to be well trained in their use[7].

Aim

The aim of this study was to highlight the benefits and the positive effects that myofunctional interceptive orthodontic treatment has in combating problems that interfere and negatively influence growth and harmonious development of the jaws in children. Also, what is the importance and the consequences of applying a mixed interceptive orthodontic treatment (functional and mechanical) to improve early signs and symptoms of malocclusion.

MATERIAL AND METHOD

The study included 30 children who had a class II malocclusion. Patients were selected from dental clinics: Profident and GM Clinic. Every patient developed clinical history dental extraoral photographs (front, profile, smile), intraoral (former side - left, right) study casts-logical radiological examinations. Distribution of patients per group was based on the type of the appliance used to correct the signs and symptoms of class II malocclusions, division 1, 2 Angle.

a. Group A - treatment was achieved by removable appliance.

b. Group B –for treatment we used Trainer system.

Patients in both groups were reassessed after 8 months from the initiation of the orthodontic treatment. We made extraoral photographs (front, profile, smile), intraoral (anterior, lateral - left, right), mid-term model, X-rays (orthopantomography, lateral cephalometric).

RESULTS

Results for Group A:

Mean values, standard deviations with minimum and maximum values for CEF parameters for the 15 patients before and after 8 months of treatment with the unit mobilized are calculated in the table below:.

Table 1. Mean values, standard deviations

CEF parameters		N	Mean	Standard Deviation	Minimum	Maximum
Before treatment	SNA	15	84,63	3,568	79,5	92,0
	SNB	15	77,00	2,070	73,0	80,0
	ANB	15	7,50	2,353	3,5	12,0
	FMA	15	25,53	3,270	20,0	30,0
	IMPA	15	88,07	5,444	82,0	101,0
	FMIA	15	66,40	5,902	52,0	76,0
	ANGLE	15	117,07	6,250	102,0	128,0
	AXIS Y	15	61,27	3,654	56,0	68,0
After 8 months of treatment	SNA	15	82,30	1,386	80,0	85,0
	SNB	15	78,73	1,534	76,0	81,0
	ANB	15	3,57	1,321	2,0	6,5
	FMA	15	26,27	1,831	24,0	31,0
	IMPA	15	92,60	2,230	89,0	97,0
	FMIA	15	60,73	3,195	52,0	65,0
	ANGLE	15	126,87	3,583	120,0	132,0
	AXIS Y	15	61,23	1,545	59,0	64,0

To determine the therapeutic effect of the device, we have compared these values with nonparametric tests "Wilcoxon Signed Ranks"[12, 13]. Probability values with p meanings are listed below:

Table 2. Probability values

Comparisons	SNA	SNB	ANB	FMA	IMPA	FMIA	UNGHI	AXA Y
Z value	-2.334	-2.374	-3.419	-1.125	-3.052	-3.238	-3.410	-0.282
pvalue	**0.020** s	**0.018** s	**0.001** s	0.261 ns	**0.002** s	**0.001** s	**0.001** s	0.778 ns
αlimit	0.05	0.05	0.01	0.05	0.01	0.01	0.01	0.05

s – significant differences
ns – insignificant differences

Results for group B:

Mean values, standard deviations with minimum and maximum values for CEF parameters for the 15 patients in group B, both before and after treatment with the device myofunctional - Trainer, are calculated in the table below:

Table 3. Mean values, standard deviations

CEF parameters		N	Mean	Standard Deviation	Minimum	Maximum
Before treatment	SNA	15	83,60	4,067	77,0	90,0
	SNB	15	76,27	2,463	72,0	82,0
	ANB	15	7,33	3,155	1,0	12,0
	FMA	15	24,47	4,015	20,0	31,0
	IMPA	15	87,37	5,280	82,0	98,5
	FMIA	15	67,77	5,895	55,5	76,0
	ANGLE	15	123,20	15,839	108,0	154,0
	AXIS Y	15	60,00	6,256	50,0	70,0

CEF parameters		N	Mean	Standard Deviation	Minimum	Maximum
After 8 months of treatment	**SNA**	15	81,73	1,799	80,0	83,0
	SNB	15	78,67	1,047	76,0	80,0
	ANB	15	3,07	1,163	2,0	6,0
	FMA	15	26,20	1,656	23,0	28,0
	IMPA	15	90,40	1,352	89,0	93,0
	FMIA	15	63,40	2,473	60,0	68,0
	ANGLE	15	128,13	4,734	120,0	137,0
	AXIS Y	15	60,83	2,889	56,0	65,0

To determine the therapeutic effect of the device, we have compared these values with nonparametric tests "Wilcoxon Signed Ranks"[12, 13]. Probability p value with significance values are written in the table:

Table 4. Probability values

Comparisons	SNA	SNB	ANB	FMA	IMPA	FMIA	UNGHI	AXA Y
Valoare Z	-1.937	-2.854	-3.302	-2.116	-2.006	-2.892	-1.166	-0.883
Valoare**p**	0.053^{ns}	**0.004**^{s}	**0.001** ^{s}	**0.034** ^{s}	**0.045** ^{s}	**0.004** ^{s}	0.244 ^{ns}	0.377 ^{ns}
Prag**α**	0.05	0.01	0.01	0.05	0.05	0.01	0.05	0.05

s – significant differences
ns – significant differences

Comparisons between parameters of group A and B

To compare values obtained for the 8 parameters of the group A with group B before and after treatment we applied nonparametric test of significance Mann-Whitney [12, 13] for the independent variables, and we obtained the following results:

Table 5. Probability values before treatment

Before treatment	*Mann-Whitney values*	*P value and semnification*
SNA	97.5	0.532^{ns}
SNB	86.0	0.264 ^{ns}
ANB	112.5	0.998 ^{ns}
FMA	93.5	0.427 ^{ns}
IMPA	94.0	0.438 ^{ns}
FMIA	95.5	0.479 ^{ns}
UNGHI	109.5	0.901 ^{ns}
AXA Y	94.0	0.440 ^{ns}

ns – insignificant differences

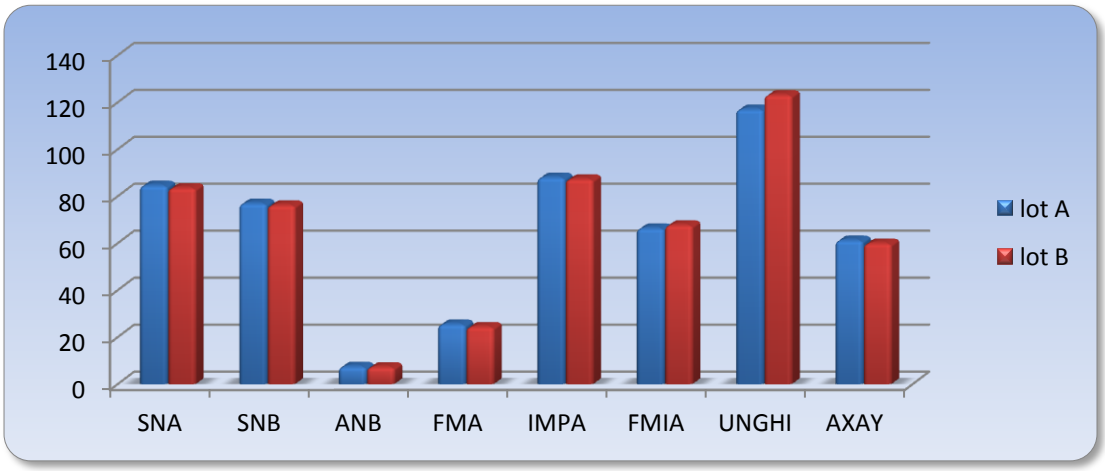


Figure 1. Differences between group A and B on the 8 parameters before orthodontic treatment

Table 6. Probability values before treatment

After treatment	*Mann-Whitney values*	*P value and semnification*
SNA	85.5	0.245 ns
SNB	108.0	0.847 ns
ANB	86.0	0.253 ns
FMA	106.0	0.781 ns
IMPA	46.0	0.005 s
FMIA	57.0	0.020 s
ANGLE	95.0	0.466 ns
AXIS Y	107.0	0.818 ns

ns –insignificant differences
s – significant differences

It is noted that IMPA values after treatment are significantly higher for group A compared to group B (p = 0.005, with significance limit α = 0.01) and FMIA values are significantly higher in group B compared to A (p = 0.02, the limit of significance α = 0.05).

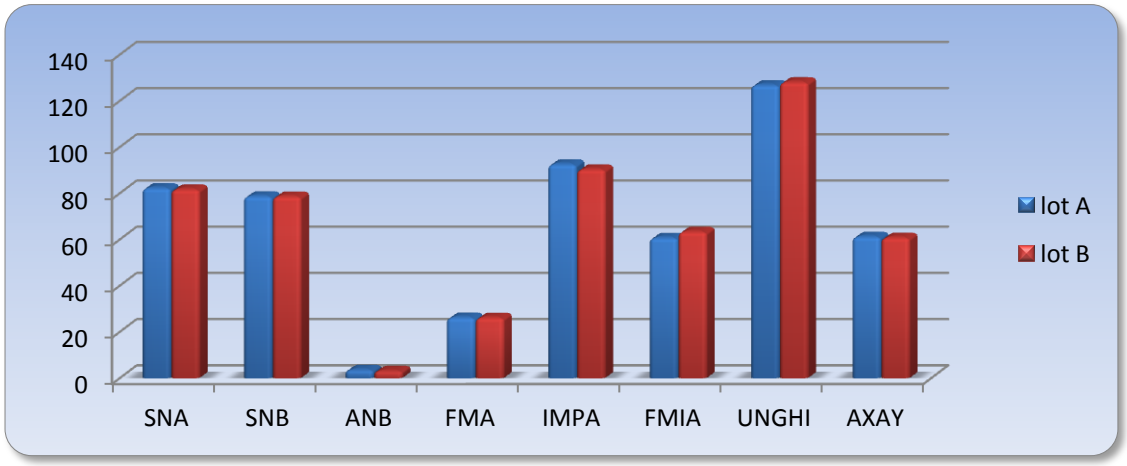


Figure 2. Differences between group A and B on the 8 parameters after 8 months of treatment

CONCLUSIONS

Clinical trials comparing the two types of devices have drawn the following conclusions:

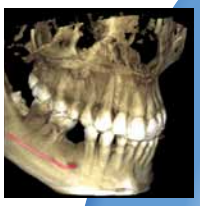
1. The major problem we face when we use the trainer as a means of treatment, is the acceptance of the device by the patient. In this case the motivation is the most important if we are to achieve results. The trainer determines changes in the teeth unlike traditional movable devices. This is a disadvantage because most pacients want a quick result.
2. For these reasons I found that the best results can be achieved when you combine them both. In the first phase mechanical treatment, to demonstrate to the patient improved dental changes. This will make him more motivated to continue treatment and he will certainly accept the trainer.
3. In biostatistical analysis of the cephalometric parameters of patients treated with movable devices and those treated with trainer it follows that: **IMPA values** after treatment are **significantly higher** for group A compared to group B ($p = 0.005$, with significance limit $\alpha = 0.01$) and **FMIA values** are **significantly higher** in group B compared to a ($p = 0.02$, with a significance limit $\alpha = 0.05$).

REFERENCES

1. *Proffit, W. R. (2007). In Fields H. W. (Ed.),* Contemporary Orthodontics (4rd ed.) St. Louis: Mosby.
2. *Frans P.G.M Van der Linden.* Problems and procedures in Dentofacial Orthopedics. Quintessence Publishing Co., Ltd., London, U.K. 1990.
3. *Frans P.G.M. Van der Linden.* Orthodontic Concepts and Strategies. Quintessence Publishing Co, Ltd, United Kingdom 2004.
4. *Graber, T, Vanarsdall, Robert L Jnr,* Orthodontics Current Principles and Techniques, Third Edition, St.Louis, Missouri, Mosby Inc. 2000.
5. *Graber T M* 1963 The 'three Ms': muscles, malformation, and malocclusion. American Journal of Orthodontics 49: 418–450
6. *Graber T M, Rakosi T, Petrovic A G* 1985 Dentofacial orthopedics with functional appliances. C. V. Mosby Company, St. Louis, pp. 139–160
7. *Chris Farrell. T4K™* (the Trainer for Kids) pre-orthodontic trainer. 2003 Copyright Myofunctional Research Co.
8. *A.S.Cayley, A.P.Tindall, W.J.Sampson and A.R.Butcher.* Electropalatographic and cephalometric assessment of tongue function in open bite and non-open bite subjects. European Jurnal of Orthodontics 22(2000) 463-473.
9. *Denize Ramirez De Souza, Tatiana Adamov Semeghini, Lucio Benedito Kröll, Fausto Berzin.* Oral myofunctional and electromyographic evaluation of the anterior suprahyoid muscles and tongue thrust in patients with class ii/1 malocclusion submitted to first premolar extraction. J Appl Oral Sci. 2007;15(1):24-8
10. *George Sargiss, DDS Brad Elkin, DMD Josh Epstein, DMD, Sonalee Kapoor, DMD Thomas Morgenstern, DMD Martin Epstein, DDS.* Management of oral habits: non-nutritive sucking and tongue thrusting. Brace place orthodontics, Volume 1, Issue 4, November, 2006.
11. *Marshall WA, Tanner JM. Puberty. In: Falkner F, Tanner JM, editors.* Human growth; a comprehensive treatise. 2nd ed. New York: Plenum Publishing; 1986. p. 171–209.
12. *Carol K. Redmond, Theodore Colton* - Biostatistics in clinical trials, Wiley Reference Series in Biostatistics, 2001, ISBN 0-471-82211-6.
13. *Dawson B. and Trapp R.G.:* Basic & Clinical Biostatistics, 4 th edition, McGraw-Hill Companies, Inc., 2004, ISSN: 1045-5523 3.

ProMax 3D • PlanScan • ProFace

Unique 3D combination for open CAD/CAM



Digital perfection

Planmeca sets new standards with world's first dental unit integrated intraoral scanner for open connectivity to various CAD/CAM systems.

We would like to invite you to explore the dentistry in new dimensions – see the perfect combination of digital intraoral scan, CBVT and 3D facial photo datasets in one 3D image. This digital perfection enables you to study patient's complete anatomy in detail, plan and utilise open interface with modern CAD/CAM systems according to your needs. Now you can be one of the pioneering specialists, whether you are an implantologist, endodontist, periodontist, orthodontist or maxillofacial surgeon. The new era of dentistry is reality. It's your decision.

Planmeca Oy, Asentajankatu 6, 00880 Helsinki, Finland
tel. +358 20 7795 500, fax +358 20 7795 555, sales@planmeca.com, www.planmeca.com

PLANMECA

1971 - 2011

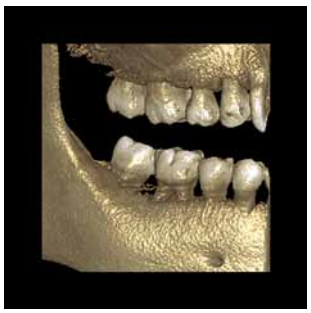
Planmeca ProMax 3D

All volume sizes

The Planmeca ProMax concept offers a full range of imaging volumes providing detailed information on patient anatomy. The comprehensive Planmeca ProMax platform complies with every need in dental radiology, offering digital panoramic, cephalometric, and 3D imaging as well as 3D face photo together with advanced imaging software.

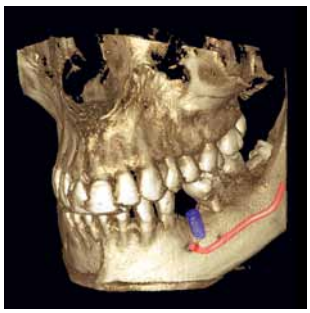
At the heart of the concept is the robotic SCARA technology: the unique robotic arm enables any movement pattern required by existing or future program, eliminating all imaging restrictions. With the Planmeca ProMax concept superior maxillofacial radiography can be performed with a single platform, today and in the decades to come.

All volume sizes



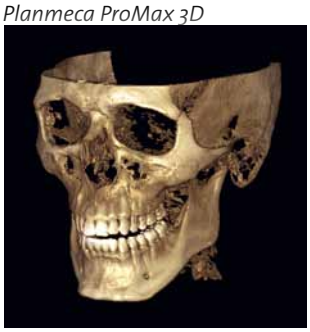
Planmeca ProMax 3D s

Ø42 x 42 mm–90 x 60 x 130 mm



Ø34 x 42 mm–140 x 105 x 130 mm

Planmeca ProMax 3D



Planmeca ProMax 3D Mid

Ø34 x 42 mm–Ø160 x 160 mm

Planmeca ProMax 3D Max

Ø42 x 50 mm–Ø230 x 260 mm

Planmeca Oy, Asentajankatu 6, 00880 Helsinki, Finland
tel. +358 20 7795 500, fax +358 20 7795 555
sales@planmeca.com, www.planmeca.com

PLANMECA

Planmeca Romexis

Software refined

Available on the App Store

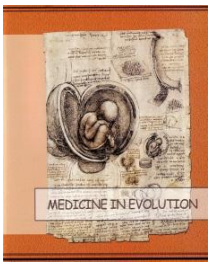
Planmeca Romexis is the software of choice for all dental imaging purposes. All patient's digital images – intraoral and extraoral X-ray images, 3D volumes, and photographs – are processed and stored in one easy-to-use system. Planmeca Romexis offers a complete set of tools for image viewing, enhancement, measurement, and implant planning, and fully integrates digital imaging with the patient's other clinical data.

Thanks to its powerful printing features, stunning printouts can be produced. Planmeca Romexis provides direct image capture from Planmeca X-ray units, interfaces with 3rd party devices via TWAIN, and is fully DICOM-compatible. Planmeca Romexis is a JAVA software that runs on Windows, Mac OS, and Linux operating systems, and embraces modern IT standards.

Planmeca Oy, Asentajankatu 6, 00880 Helsinki, Finland
tel. +358 20 7795 500, fax +358 20 7795 555
sales@planmeca.com, www.planmeca.com

PLANMECA 40 1971 - 2011

A STUDY REGARDING THE RELATIONSHIP BETWEEN CLINICAL ACTS AND TIME IN DENTIST'S SCHEDULE



CRISTINA PÎRVU[1], ION PĂTRAŞCU[2], DANIELA PÎRVU[3], MONA CORINA BUZEA[4], ANCA AXANTE[5]

[1]Department of Oro-Dental Diagnosis, Ergonomics and Research Methodology, University of Medicine and Pharmacy "Carol Davila"Bucharest
[2]Department of Dentures Technology and Dental Materials, University of Medicine and Pharmacy "Carol Davila"Bucharest
[3]Department of Dentures Technology and Dental Materials, University of Medicine and Pharmacy "Carol Davila"Bucharest
[4]Department of Oro-Dental Prevention, University of Medicine and Pharmacy "Carol Davila"Bucharest
[5]Department of Oro-Dental Diagnosis, Ergonomics and Research Methodology, University of Medicine and Pharmacy "Carol Davila"Bucharest

ABSTRACT

Aim and objectives.The present study is an investigation of some aspects of time management in dentistry. We consider these information useful in providing a better understanding of each practitioner's working context and in enabling different correlations. The general view about the discussed issues is one of the activity management in dental office and of the ergonomics applied in dental practice. Usually time management is mostly discussed in terms of economic profitability and less from the ergonomic perspective of a practice which aims to facilitate the team work. The ergonomic perspective shows that a good time management can reflect in a good functionality in the working program and can help our medical business.

Material and methods. The starting point was questioning a group of dentists on the average time they usually reserve for some common clinical acts in a general dental practice. Beside the time aspect, there were taken into account some other aspects considered important: the level of difficulty of clinical acts, the degree of assistance provided by the dental assistant, the dentist fee, the age and sex of the dentists and the number of years of practice.

Results and conclusions.The findings of our study focus on discussing the level and significance of the amount of assistance provided by the dental assistant, on assessing the degree of difficulty of clinical acts and the required total time necessary for clinical acts (sum of preparation time and execution time) as important factors to consider in determining the working time and in calculating the dentist fee. All the data series obtained for the preparation and execution times can be used for a better time management in dentistry.

Key words: *clinical acts, the difficulty of clinical acts, time for preparation, time for execution*

Correspondence to:

Dr. Cristina Pîrvu
Address: Department of Oro-Dental Diagnosis, Ergonomics and Research Methodology, University of Medicine and Pharmacy "Carol Davila"Bucharest
Phone: +4 0721278028
E-mail address: crstnprv@yahoo.com

INTRODUCTION

In this study we investigated several aspects of time management in dentistry. We started from the idea of questioning a group of dentists on the average time usually reserved for some ordinary clinical acts in a general dental practice. This coordinate of time was regarded from two perspectives: the time required for the preparation of a clinical act and the time for its execution. Besides this aspect of time, there were taken into account some other aspects considered important: the level of difficulty of clinical acts, the degree of assistance provided by the dental assistant, the dentist fee, the age and sex of the dentists and the number of years of practice. We consider these information useful in providing a better understanding of each practitioner's working context and in enabling different correlations.

The general vision of the issues is one of the activity management in dental office and of the ergonomics applied in dental practice. These concerns of the authors, dental practitioners, led to our study. On these issues we followed the literature not very vast, though. Usually time management is discussed in terms of economic profitability rather than from an ergonomic perspective of practice which aims to facilitate the team work. The ergonomic perspective shows that a good time management can reflect in a good functionality within the working program and can help our medical business.

Aim(s):

It is very important to understand the relationship between productivity and time management. Dentists who run their own practices and dental clinics managers could learn a lot about time management from economy and business studies. Time management involves planning activities and avoiding the waste of time. For an efficient use of time, continuous care should be given to this aspect and it should be evaluated periodically using records and time using analysis. One can determine which activities are more or less time consuming [1].

If the team would develop a slip of paper containing all particularities of each clinical act (difficulty, possible options for treatment technique, time for preparation and time for execution, instruments and materials needed, price) both business management and communication within the team would be much easier. Since the dentist can't always benefit from the aid of the same dental assistant for long periods of time, the moment of changing team composition would be easier to pass. Immersed in various daily needs of the practice many dentists can't take a step back to get a true picture of their own practice. No matter how much they are trying they can't figure out why their practice is constantly faced with many challenges [2].

Evaluating the difficulty of various clinical acts is motivated by the attempt of understanding dentists' different perceptions on the difficulty of the clinical acts. Assessment of the degree of difficulty at an individual personal level is useful in making the distribution in difficulty classes of the full range of clinical acts carried out in practice. This distribution helps provide rigorous time management and resources management (the proper moment for a specific clinical act, the degree of dental assistant help, time for preparations and time for executions, patient information, the dentist fee). Considering the difficulty we took into account the physical and mental involvement (focusing, attention, decision, etc.) the dentist needs in order to perform the clinical acts at an appropriate level of quality.

In an attempt to realize the use of his time the dentist must see what tasks consume most of the time and if he allocates the longest periods of time to the most important tasks or to the

least important ones. He has to know the daily period when he is the most productive and he has the greatest amount of energy in order to schedule the most challenging and important tasks for this period [3].

Because of the difficulty of clinical acts and the additional variables related to the patients, the rhythm of work (number of patients treated per day), should be individualized. There can be no question of establishing a daily work norm because of the high variability of the possible clinical situations and finally the working volume isn't as important as the quality of the clinical acts performed in the practice. Any private practice can be profitable through the quality provided not only through the large amount of patients addressing the office [4].

During this study the preparation time of a clinical act was appreciated as that period from the beginning of the program or between the patients required for organization of the scheduled clinical act. In an ergonomic vision this period of time has different meanings and purposes for the dentist and for the dental assistant. The special work request of the dentist, both physical (body posture and great finesse executions), and psycho-emotional (concentration and high demands) should be followed by a break for relaxation and recovery of physical resources. Thus the interval of time between patients, should it be long or short, must be a „break"for the dentist. The dental assistant's work is much different- depending on the level of help requested by dentist: assistance only at special demand or a permanent assistance possibly four handed dentistry (working style where the dentist works seated and is assisted permanently by a specialized dental assistant who knows very well the stages of the treatment). Regardless of the level of help, the dental assistant is responsible for preparing the clinical acts. However, a dental assistant working four handed dentistry needs a little time to recover because of the high postural and physical demands that appear during working. If some of the instruments and materials were selected and arranged from the beginning of the working day for the whole day (using trays of instruments for each scheduled clinical act) the dental assistant could have easier working tasks.

The time of preparation between the patients often functions as a buffer for the disturbance situations in the program (patient delay, extension of time of executions for a clinical act). To the extent that there is a rigorous time management, schedule disturbances occur less often and breaks between the patients could be properly used. This time is a part of the working routine impossible to rule out and it should be managed properly.

The execution time of various clinical acts is the most important period in the consciousness of all dentists. There is a large variability of clinical cases and working situations and therefore we can talk only about approximated average values for the time of executions. However for a good time management it is important to refer to these values and use them when we work out on the agenda. The difficulty of the clinical acts is often perceived in terms of this component of time though sometimes a difficult clinical execution does not last very long and on the contrary, an easy one may ask for a longer period of time. The execution time is naturally an important element in the calculation of the dentist fee corresponding to each clinical act. Being difficult to asses the value of the dentist's work we can still relate to a measurable element that is time. Also, for the correct judgment of the dentist's fee we can enter a degree of difficulty given by the personal perceived degree of difficulty.

In this study we took a discreet look on the dentist's fee as an

important component of the price, but difficult to investigate.

MATERIAL AND METHOD

The study was divided into two phases. In the first phase we asked a group of 12 general dentists to specify on an interview record which are the 10 most common clinical acts performed by them in daily practice. We mentioned that we understand by "clinical act" the intervention performed during a patient's appointment with a reserved time for preparation and execution. We synthesized the responses and chose the most frequently mentioned clinical acts and we obtained the following list:

M1. consultation and Rx recommendation
M2. scaling and cleaning on the front lower teeth
M3. preparation and filling with resin composite for a second class cavity
M4. preparation and filling on a front upper tooth – high aesthetic requirement
M5. cuneiform lesion treatment
M6. anesthesia and one root tooth nerve removal
M7. endodontic treatment (mechanical and chemical) on an one root tooth
M8. one root canal filling - old technique (one gutta-percha cone)
M9. one root canal filling - condensing gutta-percha
M10. one tooth preparation for metal-ceramic crown
M11. impression of two abutments and prosthetic field
M12. preparation and impression for a metal post
M13. anesthesia and one root tooth extraction

The consultation was not among the frequently mentioned clinical acts but as it precedes any action of investigation of the case we thought it would be useful to be evaluated in the study.

For the second stage of the study we made a questionnaire chart that included the list of clinical acts. We asked the dentists to make an assessment of the difficulty (with variations small, medium, large), time of preparation and time for execution for each clinical act from the chart. The request was stipulated as follows *"Please value the following therapeutic maneuvers from the difficulty point of view, the average time for preparation and average time for execution- in your vision according to your practice and the way you work."*. The questionnaire chart also included two separate questions: one on the help offered by the dental assistant with the options: "I do not have a dental assistant", "my dental assistant helps me only when I ask her" and "my dental assistant helps me permanently or we work four handed dentistry" and another question on the dentist fee per hour with the following responses: "I don't know, I haven't calculated", "....RON / hour" and "confidential".

The application of the questionnaire chart to all participants in the study was preceded by a phase of validation required due to the questionnaire format of the chart and the originality of the study. For this we asked ten colleagues who initially responded to the questionnaire to respond one more time after a minimum of two weeks. Afterwards we evaluated and compared their two variants and noticed the following:

— regarding the difficulty assessing we paid attention to the situations where there was a significant difference in assessment (low- difficulty and great-difficulty) indicating a situation of difficult assessment or inattention in filling the chart. From the 130 assessments (10 participants, 13 clinical acts) this situation occurred in only 2 cases.)
— regarding difficulty assessment our attention has been withdrawn by the situations in which there has

been significant appreciation difference- low versus high difficulty, situations which mark a difficulty in appreciating these aspects or lack of attention when filling in the questionnaire. From the 130 assessments (10 participants, 13 clinical acts) this situation occurred in only 2 cases.

— regarding the time of preparation and time of execution assessment in the two variants we followed the time differences between the two responses. The differences sometimes significant shows that regarding the time required for preparations and time required for execution of the clinical acts dentists do not realize very well their needs „being wrong" and hesitating both in plus and minus. That can be easily attributed to the fact that the clinical situations are very diverse but we also suspect a lack of concern in determining their own time needs. For the time of preparation the differences that occur are on an average 3.5 minutes and for the time of execution an average of 9 minutes. These means will be further used for discussing the final results.

This study including 180 participants is a transversal investigation. The only criteria for the selection of participants was the request to be a general practitioner dentist. The evaluator was present when filling and he could provide complete explanations for participants, as required.

RESULTS

Data processing was performed with Stata 11IC software (StataCorp LP, Texas, USA, version 2009). Probability value $p < 0.05$ was considered statistically significant.

Participants in the study were aged between 25- 75 years (mean 37.7 years), the 118 women (65.6%) and 62 men (34.4%), with experience in the profession, or the number of years of practice between 1- 50 years (mean 12). Due to the large ranges of age and years of practice we have generated three groups divided as follows: first 10 years – „teens" in profession, the next 20-years, „adults" and the last 20 years, „seniors".

Evaluation of the level of dental assistant help generated the results shown in Figure 1. Gender distribution was also recorded.

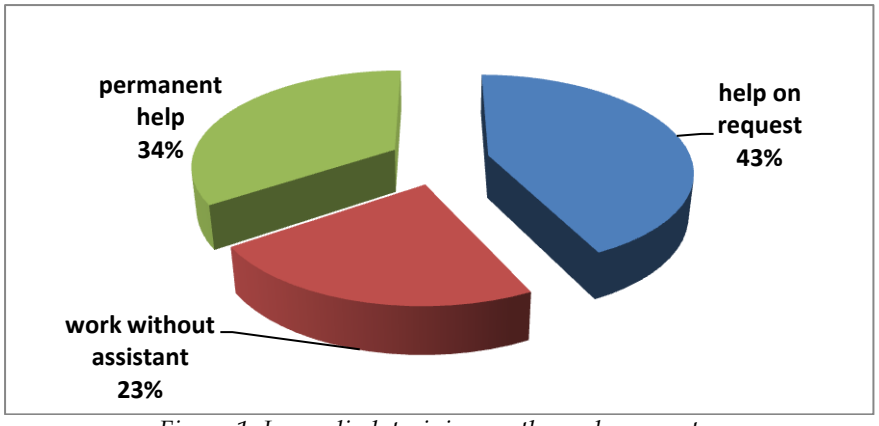


Figure 1. Lower limb training on the cycloergometer

By evaluating the difficulty we sought to obtain a ranking of difficulty perceived by all participants in the study for the 13 clinical acts from the questionnaire chart. For this we calculated a difficulty score for each clinical act generated by all participating dentists and we obtained

a series of values that enabled us to order the clinical acts. The ranking obtained from the maximum value to the minimum value or from the most difficult clinical act to the least difficult one is: M10, M4, M3, M9, M12, M11, M7, M13, M6, M8, M5, M2 and M1.

We also calculated a score of overall perceived difficulty for each respondent (the sum of the difficulty for the 13 clinical acts per dentist) and we watched (the values of the statistical data, t-Student and oneway ANOVA tests) the perceived difficulty associating with: gender, age, years of practice and dental assistant help with the following results:

— There is no significant difference between the 2 sexes difficulty assessment (p = 0.71)
— There is no significant difference difficulty appreciation for the 3 age groups (p = 0.34)
— There is no significant difference difficulty appreciation for the 3 years of practice groups (p = 0.33)
— There is no significant difference reported difficulty assessing the degree of support of health (p = 0.35)
— In order to assess the time of preparation we calculated the average preparation times for each clinical act generated by all participants and we obtained values between 3.5 minutes and 6 minutes and an order of preparation time for the 13 clinical acts (show low: M3, M4, M6, M7, M12, M11, M13, M10, M8, M5, M2, M9, M1).
— We calculated the average preparation time for all clinical acts (an average of preparation time for the 13 clinical acts) for each dentist and we obtained values between 0-15 minutes with an average of 5.27 min. Afterwards we watched (through statistical data values, t-Student and oneway ANOVA tests) the associations of the average preparations time for all clinical acts with gender, age, years of practice and the level of dental assistant help with the following results:
— There is no statistically significant association of the average preparation time with participants' gender (p = 0.93)
— There is no statistically significant association of the average preparation time with participants' age group (p = 0.45)
— There is no statistically significant association of the average preparation time with participants' years of practice (p = 0.29)
— There is no statistically significant association of the average preparation time with participants' level of dental assistant help

There were dentists who have not mentioned a preparation time (0 minutes) to any clinical act (19 dentists), representing 10.5% of all participants.

In order to assess the execution time we calculated the average execution times for each clinical act generated by all participants and obtained a series of values for each clinical act and an order of specific execution time. The order is shown in table 1. The table shows the execution times in three groups differentiated by color: 30-40 minutes, 20-30 minutes, and a group under 20 minutes. A separate column shows the times obtained to which 9 minutes were added, the value obtained in the validation stage as a variation of the working time.

Table 1. The execution times of the 13 clinical acts

	Clinical acts	Time-minutes	+9 minutes
1	preparation and filling on a front upper tooth – high aesthetic requirement	39	48
2	preparation and filling with resin composite for a second class cavity	33	41

	Clinical acts	Time-minutes	+9 minutes
3	one tooth preparation for metal-ceramic crown	27	36
4	endodontic treatment (mechanical and chemical) on an one root tooth	26	35
5	preparation and impression for a metal post	26	35
6	anesthesia and one root tooth nerve removal	25	34
7	scaling and cleaning on the front lower teeth	21	30
8	one root canal filling - condensing gutta-percha	21	30
9	anesthesia and one root tooth extraction	20	29
10	impression of two abutments and prosthetic field	20	29
11	cuneiform lesion treatment	20	29
12	one root canal filling - old technique (one gutta-percha cone)	19	28
13	consultation and Rx recommendation	17	26

We also calculated the average execution time of all clinical acts (an average execution time for the 13 clinical acts) calculated for each dentist and then we watched (through statistical data values, t- Student and oneway ANOVA tests) the associations of the average executions time for all clinical acts with gender, age, years of practice and the level of dental assistant help with the following results:

— There is no statistically significant association of the execution time with participants' gender (p = 0.52)
— There is a statistically significant association of the execution time with participants' age group (p = 0.002), in the sense of the average execution time descending as the dentist get older.
— There is a statistically significant association of the executions time with participants' years of practice (p = 0.007) within the meaning of descending average execution time as advancing in years of practice.
— -There is no statistically significant association of the average preparations time with participants' level of dental assistant help (p = 0.14)

Evaluating the dentist's fee gave us the results shown in figure 2.

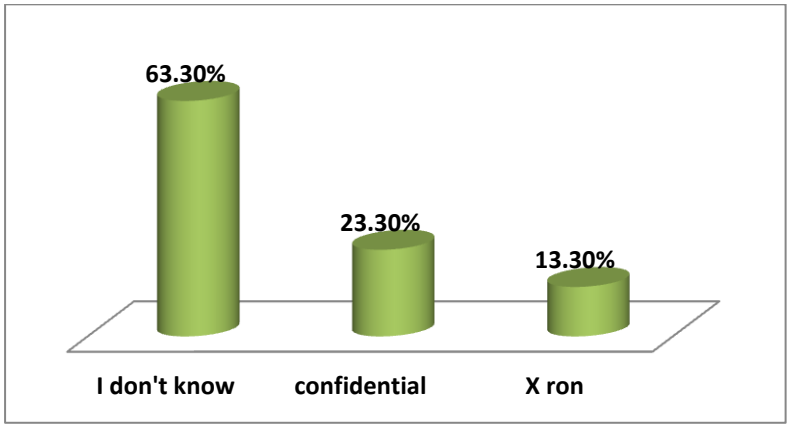


Figure 2. The dentists' fee per hour

Bearing in mind the small number of those who declared a value for their fee per hour we can only make „shy" assessment. Results of these data are:

— of the 24: 12 women, 12 men, years of practice: from 2 to 24, average 8.41 (until 10 meaning „teenagers" in the profession)
— fee / hour: 50-200 RON, overall average- 117 RON, women average- 97, 5 RON, men average- 136, 6 RON

— 2 age groups (2-12, 13-24), fee / hour: 120 RON, respectively 110 RON

DISCUSSIONS

The level of dental assistant help is a very important factor that can determine very different working times from one dentist to another. Following the results we see that there is a significant amount (23%) of dentists who work without dental assistant for various reasons-either economical or claiming difficulties in achieving a functional dentist-assistant team. This category is particularly disadvantaged in terms of ergonomics as the dental practice has a surgical character and the clinical acts are extremely complex and require many tools and materials. Dentists who receive support from a dental assistant use it on different levels: on request (43%) or on a permanent basis (34.4%). We believe that in terms of dental assistant's help, it should be used at the maximum level. To consent as a dentist to be helped only by request when there is the possibility of getting permanent aid is unproductive. Sometimes a permanent efficient assistance requires the involvement of the dentist for proper training of the dental assistant.

Regarding the difficulty of clinical acts the ranking obtained by us for the limited range of clinical acts under discussion can be an example and a brief guide for individual assessment in each team. Evaluating the degrees of difficulty of all the clinical acts of practice could be useful for a rational activity planning.

Following the individual perceived degree of difficulty in relation to gender, age, years of practice and dental assistant help there is no significant association. This is probably due to the outstanding ability of dentists to adapt to any working conditions, to assume a total responsibility for clinical acts and to compensate by personal effort many difficulties. Nevertheless, it is hard to believe that a clinical act could be easier and less time consuming without a proper dental assistant help.

The differences and the classification obtained for the preparation times of different clinical acts suggests that there is a motivation for discrimination of the preparations times. Both dentists and dental assistants should pay attention to this fact.

At the average obtained for the time of preparation (5.27 minutes) we could add the 3.5 minutes observed as variation between two successive responses of the same dentist in the validation stage to get a rounded value of 9 minutes. This value may represent a minimum preparation time to be booked between the clinical acts.

We appreciate that dentists who haven't mentioned a time of preparation for any clinical act even if in real working conditions they have a time for preparation either do not sufficiently realize it, or do not consider it very important or they do not offer it a special attention. Under these conditions its management may not be appropriate.

The values obtained for the execution times of clinical acts suggest how we can adjust the execution time to the specific clinical acts to be performed and allow us to compare our times to the average data collected from a large number of colleagues. In addition, dentists can create their own groups of data for the executions times including all the clinical acts they perform in practice and taking into account their personal experience.

Following the association of the average execution time of all clinical acts gender, age, years of practice and the level of dental assistant help we observed a significant association with

the age and years of practice. Reducing the execution time with the age and years of practice may be related with the experience gained in time. This experience translates into better organization. We ask if advancing in practice could determine a lower working patience and maybe even a loss of "the sense of detail "unfavorable aspects for the practice quality.

The dentist's fee per hour means the price strictly calculated for the dentist's work and we explained this in the questionnaire. We watched this aspect because for a correct calculation of the price of a clinical act the price of the working time has to be taken into account, in addition to many other items.

Only 24 participants showed transparency of fees and thus we can only take for granted the values given. The participants who ticked "confidential" calculated probably a personal fee but they were reluctant to declare it although the questionnaire was anonymous. The majority of participants who answered „ I do not know, I haven't calculated" shows that were not concerned with making a rigorous calculation of the clinical acts costs. The exact fee of the dentist should be used when calculating the price for a clinical act.

We noticed on the filled questionnaires that there were three clinical acts that some dentists do not perform: one root canal filling - old technique (one gutta-percha cone) - 6.1%, one root canal filling - condensing gutta-percha - 24.4% and, preparation and impression for a metal post - 1.6%.

For the two techniques of root canal filling there is a simple explanation one being the alternative to the other one. The root canal filling with one gutta-percha cone technique is an old technique and there is a tendency in the natural evolution of the profession to be replaced by gutta-percha condensation techniques. We noted that most of the dentists declare that they use both techniques. For the reconstructions with metal post there is also an alternative – the use of prefabricated glass fiber posts and resin composite materials.

CONCLUSIONS

The level of dental assistant's help should be evaluated carefully in the team work. The higher it is, the more ergonomic could the everyday practice become and the work efficiency could be increased. The difficulty of the clinical acts and the total time required for them (the sum of time for preparation and time for execution) may be an important factor to consider in composing the working program and in calculating the dentist honorary. All the data obtained for the preparation and execution times could be used for better time management in dental medical practice.

REFERENCES

1. Finkbeiner B.L., Finkbeiner C.A., *Practice Management for the Dental Team,* Sixth Edition, MOSBY 2006.
2. Levin R.P., *Evaluarea obiectiva a unui cabinet stomatologic*, Actualităţi Stomatologice, 2012; 55:14-15.
3. *Curs de management in medicina dentara,* Proiect: ErgoManagementPreventiv: Ergonomie, Prevenţie, Management performant în medicina dentară prin aliniere la standarde europene, Proiect cofinanţat prin Fondul Social European prin Programul Operaţional Sectorial Dezvoltarea Resurselor Umane 2007-2013,, Investeşte în oameni"
4. Dougherty M., *Ergonomic principles in the dental setting: Part 1,* dentalproducts.net., 2001

INSTRUCTIONS FOR AUTHORS

The journal publishes general reviews, studies and clinical, epidemiological, experimental and laboratory research, clinical case presentation, papers from the history of medicine, reviews, scientific and technical state-of-the-art articles, medical informations and opinions. Only papers which have not been published or sent for publishing in other journals are accepted. The authors are responsable for the opinions expressed in the papers. ***The paper must be edited both in Romanian and in English; the English version will be supervised by our collaborator Dana Brehar-Cioflec, MD, PhD; typed on white A$_4$ paper (fonts - Times New Roman 12, Romanian characters, line spacing 1.5, upper and lower margins 2cm, left border 3cm, right border 2cm) and on CD, DVD or Memory Stick***.

Manuscripts will not exceed:

- general reviews: 6-8 pages
- studies and researches: 5-7 pages
- case presentations: 2-4 pages
- reviews, scientific and technical state-of-the-art articles, medical informations and opinions: 1-2 pages.

The paper will be edited according to international editing rules for manuscripts. The title will be written in capital characters and it will be followed by the name and surname of the author (authors), followed by their place of work (place where the paper has been elaborated). Studies and researches will be followed by a brief abstract, followed by 3-4 key-words.

The body of the paper will be structured on the following chapters: introduction, aim, objectives, material and method, results and discussions, conclusions. The references will be presented alphabetically and in conformity to the Vancouver Convention, including:

- for articles: name of the authors and surname initials, title of the article in the original language, title of the journal according to the international abreviation system, year of issue, volume, number, pages;
- for books: name of the authors and surname initials, volume, publisher (editors), city of publishing, year of issue.

Citation of references inside the body of the paper will be put between brackets, Harward style (author, year) or Vancouver style (number in square brackets or superscript). Cited reference titles will be selected, maximum 6 for studies and case presentations and 12 for general reviews. Acceptance, rejection or the need of alterations in sent materials, or in inconography, will be comunicated to the authors in due time. For this, the authors will indicate the person and address for corespondence (phone number, e-mail address). Given the less pleasant experience of the editorial board with some articles being rejected because they did not meet publishing criteria, we decided to support those who intend to publish in this journal by detailing the way such a paper should be elaborated, as well as our requirements.

Except some particular aspects concerning this journal, the following details are general requirements asked or imposed by other journals as well. Conditions to be met in order to propose a paper for publishing. The main author has the

responsability to make sure the article has been approved by all the other authors. The journal will have copyright for papers accepted for publishing. The editorial board reservs the right to change the style and dimensions of an article (major changes will be discussed with the main author) and to decide the date of issue.

2. FIRST PUBLICATION

The editorial board will not consider a paper already reported in a published general review or described in a paper proposed to or accepted by another journal. This does not exclude papers which have been rejected by other journals. Also, papers which have been presented at a scientific meeting will be accepted for discussion if they have not been entirely or partially published in a similar publication. „Multiple" publishing of the same study is seldom justified. One of the possible justifications is publishing in a second language but only if the following conditions are met:

- Editors of both journals involved are fully informed;
- Priority of the initial publication will be respected by a minimum publishing interval of two weeks;
- For the second publication, a shortened version will suffice;
- The second version strictly reflects data and interpretations in the first;
- A footnote may state: „This article is based upon a study initially published in [title of the journal]".

3. PATERNITY

Paternity must reflect the common decision of the coauthors. Each author must have participated enough to take public responsability for the content. A paper with collective paternity must have a key person responsable for the article.

4. COPYRIGHT

In order to reproduce materials from other sources, written agreement from the copyright owner must be obtained:

- photographer – for unpublished photographs;
- hospital where the photographer (physician) is employed – for unpublished photographs performed during the employment period;
- initial publisher – for a table, picture or text which have previously been published elsewhere.

5. ETHICAL ASPECTS

Do not use name of patients, initials or hospital observation charts numbers. If a photograph of a body part which could allow direct or deductive recognition of the patient needs publishing, then the paper must be accompanied by the written consent of the patient and clinician, as well.

6. PRESENTING THE MANUSCRIPT

For the journal *„Medicine in evolution"*, the manuscript must be typed double spaced, on white A_4 paper – 210 x 297mm, on one side (2.5cm upper and lower borders, 3cm left and 2cm right border, respectively), in clear characters, no further corrections or addings. It is advisable that articles are presented on CD or other data transfer methods, in Word format, 12 Times New Roman fonts - using Romanian characters – respecting the same page order, accompanied by a printed version. Graphs – black and white or coloured – may be generated in MS Excel or MS Graph, inserted in the body of the paper or presented in a different file.
Infected materials will not be used.

6.1. FIRST PAGE (TITLE PAGE)

Together with the title and names of the authors, the first page must include the affiliation, professional and university degree (if applicable), marked by asterisc for every author; it is advisable to give at least a phone and/or fax number or e-mail address of the first author who may be contacted by the editors for additional recommendations or explanations.

6.2. ABSTARCT OF THE PAPER

6.2.1 Recommendations for original studies

Original studies must include a structured abstarct of maximum 150 words, containing the following titles and informations:

- Aim and objectives;
- Material and methods;
- Results;
- Conclusions;
- Key words: give 3-5 key words;
- The abstract will be translated into an international circulation language.

6.3 CONTENT OF THE PAPER

6.3.1 For original articles

The text will usually be divided into sections:

- Introduction – presentation of general aspects, in the context of the approached theme
- Aim and objectives – Define the aim of the article. Briefly expose the rationale of the presented study or observation. Make strictly pertinent referals and do not exhaustively review the subject. Do not include data or conclusions from the paper.
- Material and methods – Describe the selection of observations or subjects for the experiment (including controls). Identify methods, equipments (with the name and address of the manufacturer in brackets) and give sufficient details on procedures. Give references for the selected methods, including statistical methods; offer details and brief descriptions for previously published methods which are not well known; describe new or

substantially modified methods, justify their use and assess their limitations. Precisely identify all used drugs and chemicals, including generic names, dosage and administration ways. Describe statistical methods with sufficient details for reported results to be verified. Whenever possible, quantify discovered aspects and present them with appropriate measurement indicators for the uncertainty or error of measurement (such as confidence intervals).

- Results – Present results in a logical succession as text, tables and illustrations. Emphasize or briefly describe only important observations.
- Discussions – Underline new, important aspects of the study. Do not repeat in detail data which have been presented in previous sections. Include implications of revealed aspects and their limitations, including implications for future studies. Connect your observations to other relevant studies. Relate the results to the aim proposed for the study.
- Conclusions – organize conclusions which emerge from the study. In the end state: a) contributions to be acknowledged but which do not justify paternity right; b) thanks for technical support; c) thanks for financial or material support.

6.3.2 Indications for case reports

Themes may be selected from all medical fields. Manuscripts which offer a special gain for daily activity will have priority. The title must be clearly, precisely stated. It may be completed by a subtitle. It is advisable to include in the key words of the title the main message, the special element which may be observed from the case evolution. The content of a case report must be divided into three parts:

- Introduction – It must include a maximum of 15 typed rows (half page). Here, the main medical problem is summarized in order to place the case in a specific domain.
- Case report – It contains essential specific information on the case.
- In order to make a logical, chronological and didactical case report the following 5 chapters are needed:

  I. Anamnesis;
  II. Clinical examination data;
  III. Laboratory data;
  IV. Additional paraclinical investigations;
  V. Treatment and evolution.
- Discussions – The reason for the case report must be stated. The report must be patient-centered. Occasional deviations from typical (characteristic) evolutions, nosologically important facts must be presented in such a manner to expose the clinical picture as completely as possible. The case report must not appear as an appendix of a general review. Dimensions of a case report: maximum 6-8 typed pages, 30 rows of 60 characters/page.

6.4. MEASUREMENT UNITS, SYMBOLS, ABREVIATIONS

All measurements must be expressed in International System (IS) units. Abreviations must be fully explained when first used.

6.5. TABLES

Tables are noted with Roman figures and they will have a brief and concise title, concordant with their content.

6.6. ILLUSTRATIONS

Number all illustrations in Arabic figures in a single succession. Apply a label on the back side of every illustration, containing its number and an arrow indicating the upper side. Coloured illustrations may be accepted but it is the choice of the editors, according to particular technical abilities of each journal issue, or it may involve a fee in special cases.

6.7. EXPLANATIONS FOR DRAWINGS AND GRAPHS

Explanation for drawings and graphs must be clear and in readable dimensions, considering the necessary publishing shrinkage.

6.8. PHOTOGRAPHS

Offer glossy, good quality photographs. Any annotation, inscription, etc. must contrast with the ground. Microphotographs must include a scale marker.

6.9. ILLUSTRATION LEGENDS

Include explanations for each used symbol, etc. Identify the printing method for microphotographs.

6.10. REFERENCES

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in the text of the publication, assignment or essay, not in alphabetical order(according to the Vancouver rules). List only one reference per reference number. It is very important that you use the correct punctuation and that the order of details in the references is also correct.

- Books - Standard format - #. Author of Part, AA. Title of chapter or part. In: Editor A, Editor B, editors. Title: subtitle of Book. Edition(if not the first). Place of publication: Publisher; Year. p. page numbers.
- Journal Articles - Standard format - #. Author of article AA, Author of article BB, Author of article CC. Title of article. Abbreviated Title of Journal. year; vol(issue):page number(s).
- E-Books - Standard format - #. Author A, Author B. Title of e-book [format]. Place: Publisher; Date of original publication [cited year abbreviated month day]. Available from : Source. URL.
- E-Journals - Standard format - #. Author A, Author B. Title of article. Abbreviated Title of Journal [format]. year [cited year abbreviated month

day];vol(no):page numbers[estimated if necessary]. Available from: Database Name (if appropriate). URL.

- Internet Documents - Standard format - #. Author A, Author B. Document title. Webpage name [format]. Source/production information; Date of internet publication [cited year month day]. Available from: URL.

7. COPIES FOR PUBLISHING

In order to accelerate publishing, the main author will send a set of printed sheets presenting the final version of the paper, as it will appear in the journal. It is really helpful that texts to be also sent on electronic support, diacritic characters mandatory.

8. REJECTION OF PAPERS

If a paper does not meet publishing conditions, whatever these may be, the editors will notify the first author on this fact, without the obligation of returning the material. Original photographs or the whole material will be returned only if the author comes to the editor and takes them.

Papers submitted for publishing will be addressed to:

Prof. Angela Codruta Podariu, DMD, PhD

Journal Medicine in evolution
Department of Preventive, Community Dental Medicine and Oral Health
Splaiul Tudor Vladimirescu no. 14 A
300041, Timişoara
Phone: 0256-204950
Email: proiectetm@yahoo.com

Dana Brehar-Cioflec, MD, PhD

Institute of Public Health *"Prof. Dr. Leonida Georgescu"* Timişoara
Bd. Victor Babeş no. 16
300226, Timişoara
Phone: 0256-492101
Email: dcioflec@yahoo.com