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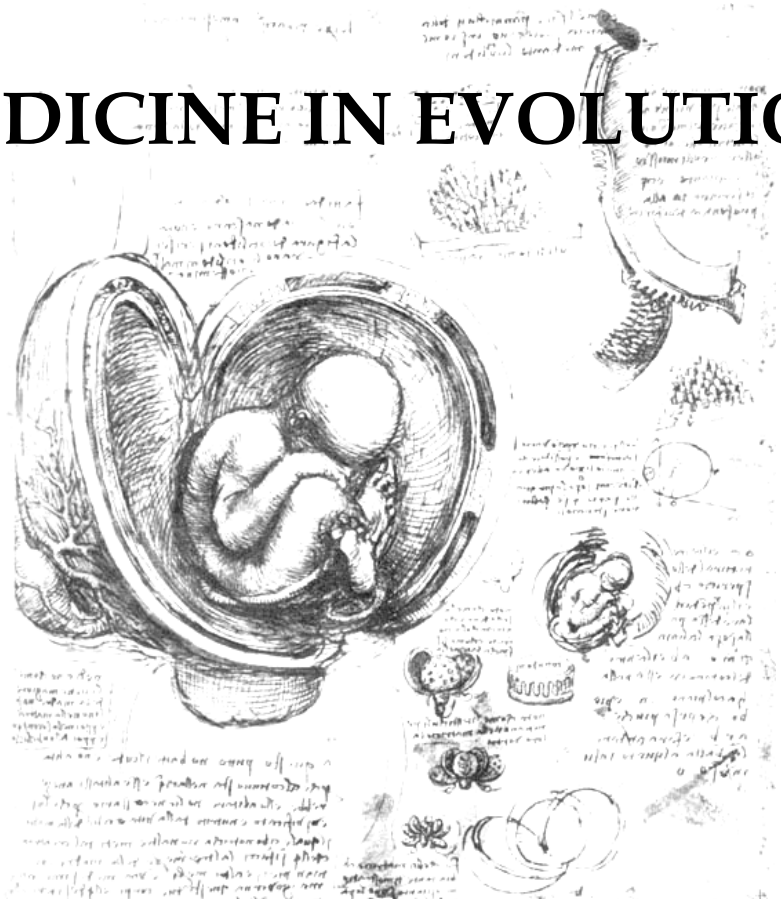

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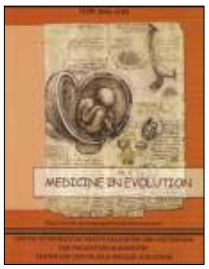
ARTICLES

AN UPDATED REVIEW ON THE RESIN INFILTRATION TECHNIQUE OF INCIPIENT PROXIMAL ENAMEL LESIONS



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ABSTRACT

Objectives: *Dental caries on proximal tooth surfaces is still a problem in many industrialized countries. The objectives of this review were to present the scientific basis and the principles of the resin infiltration concept, to discuss the inherent clinical applications, and to describe how these backgrounds can be integrated into the concept of minimum intervention dentistry.*

Data sources: *Data were identified by searches of the Cochrane Registers, Medline, and Scopus. Papers published in English and German up to October 2010 were selected and most up-to-date or relevant references were chosen. Crossreferencing of significant papers identified additionally relevant articles written in other languages and those of historical value.*

Study selection: *A total of 18 in vitro studies (focusing on penetration depths or demineralization prevention) were found, and four clinical/ one in situ study (involving 213 subjects) could be retrieved; these studies were not comparable.*

Conclusions: *The clinical research evidence on the resin infiltration technique currently is of moderate extent to reach any decisive conclusions; however, based on available laboratory and clinical studies it seems convincing that resin infiltration of enamel lesions should reduce (or even stop) the progress of white spot lesions. Combining this ultraconservative restorative approach (which is considered microinvasive) with a substantial caries remineralization program may provide therapeutic benefits and significantly reduce both longterm restorative needs and costs, thus complementing the concept of minimum intervention dentistry.*

Key words*: enamel, fluoride, minimum intervention dentistry, remineralization, resin infiltration, subsurface caries lesion*

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INTRODUCTION

Since its advent as an academic discipline at the end of the 19th century, dentistry was influenced by a mechanical era (with high speed rotary cutting instruments), and predominantly used a surgical approach to eliminate caries. This included radical removal of diseased portions of the tooth, along with (material-driven) geometrical extensions to areas which were assumed to be caries resistant; however, this concept was never scientifically based, and was misleading. Today, it can be stated that there is no need to remove sound tooth structure in the name of prevention, and modern techniques are considered minimally invasive and non-destructive.[1]

From the advanced knowledge on caries development, it is well accepted that a cavity is but a symptom of the disease. Therefore, discovering a frank cavity is not equivalent to caries diagnosis, and caries diagnosis – if defined as an intellectual course of collecting and consolidating data obtained by clinical and radiographic examination along with the use of objective diagnostic armamentarium, biological knowledge, and information gained from anamnesis – will be much more than detecting breakdown of surfaces. Today, the concept of minimum intervention dentistry has been well accepted,[2] and should be based on five generally accepted principles:

- scientifically orientated caries diagnosis of early lesions including adequate diagnostic devices;
- disease control by reduction of cariogenic bacteria/modification of the oral flora and patient education;
- remineralization of the earliest lesions;
- minimum surgical intervention of cavitated le-sions; and
- repair in favor of replacement of defective restorations.[2]

Proximal caries constitutes a large health problem, and, at the age of 21 years, up to 50% of pa-tients show carious or restored proximal surfaces.[3] Therefore, a much more tissue-preserving approach to arrest and control of proximal (or smooth surface) carious lesions has been considered beneficial, and this concept aims at infiltrating the highly porous structures of incipient enamel lesions by means of low viscous resins. Consequently, a dedicated resin (Icon caries infiltrant, DMG) with a low viscosity and a high penetration coefficient has been developed by the Berlin research group and has been marketed since March 2009.[1]

The purpose of this paper is to present the scientific basis and the principles of the resin infiltration technique, to discuss the inherent clinical applications (which are considered microinvasive), and to describe how these backgrounds can be transferred into clinical practice.

DATA SOURCES AND STUDY SELECTION

We searched The Cochrane Library, Medline, and Scopus for relevant papers up to October 2010. The main search terms were "demineralization", "enamel", "infiltration", "subsurface lesion", and

"white spot lesion". Papers published in English and German was selected and most uptodate or relevant references were chosen. The research resulted in 18 experimental and 5 clinical papers. Three fields of interest were identified (reaction of resin with artificial enamel lesions, 12 studies; with natural enamel lesions, 6 studies; in vivo or in situ studies, 5 studies). A compilation of the respective papers is presented in Table 1.

REVIEW – SUBSURFACE LESIONS

An initial subsurface lesion will appear in case of undisturbed growth of dental plaque, and with continuing acid production. Subsequently, a demineralized area can be histologically visualized (Fig. 1a), with differing pore volumes (translucent zone, 1%; dark zone, 2% to 4%; body of the lesion, up to 25%; surface zone, <5%). Dissolution may start at the prism cores, and mineral losses of up to 50% have been observed at interprismatic areas and from the prism peripheries. The surface layer has a varying thickness of some 40 µm and a mineral content of up to 82 vol%. Thus, this layer has been called pseudointact.

In 1966, BACKER DIRKS4 reported on the fate of initial carious lesions on smooth surfaces, and showed that some 51% of early white spot lesions might disappear after several years. This paper has been cited innumerable times, and, since that time, the profession has been increasingly attracted by the concept of remineralization.[3]

How-ever, in a very similar study by POT et al.,[5] only 13% of white spot lesions had disappeared while 50% showed no changes. In these two (uncontrolled) studies,[4, 5] the authors did not clearly differentiate between active (chalky, rough surface) and inactive lesions (shiny, hard surface), and lesion disappearance has been attributed to either (1) elimination of caries challenge, or (2) remineralization. Unfortunately, many of the ensuing work obviously has disregarded that in his original work BACKER DIRKS4 indeed did speculate on either re-mineralization, abrasion, or even both when trying to explain the clinically observable disappearance of the smooth surfaces' white spot lesions after several years. Moreover, while many white spot lesions on smooth surfaces had disappeared, the same paper emphasized that in the identical period proximal caries obviously did not.

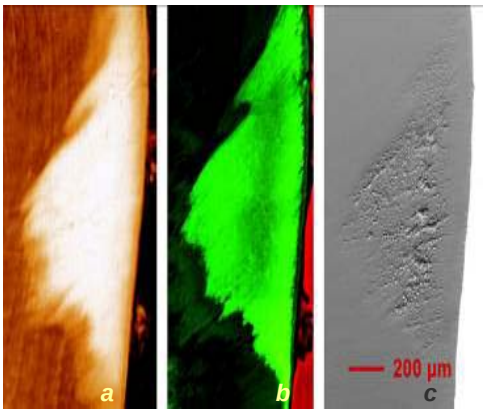

Fig. 1 Light microscopic (*a*) aspects of a perpendicularly cut proximal surface of a molar showing a white spot lesion. Confocal laser scanning micrograph (CLSM; *b*) of corresponding lesion confined to outer enamel, depicting the principle of resin infiltration into subsurface lesions and revealing resin-infiltrated parts of the lesion (green, resin infiltrant labeled with fluorescent dye, fluorescein isothiocynate [FITC]). Scanning electron micrograph (SEM) of the same lesion (*c*), confirming obturation of demineralized areas (note that at deeper lesion aspects, micropores have not been occluded).

Clinically, the degree of remineralization seems to be limited, and this has been attributed to the presence of organic substances attaching to the enamel surface and possibly occluding the underlying pores in the carious lesion.

Table 1 Compilation of laboratory and clinical studies on resin infiltration. Experimental design and main outcome of resin infiltration on artificially demineralized specimens and natural caries are given

Publication Year	Ref. No.	Number of Teeth/ Patients	Type of Enamel	Type of Demineralization		Surface Etching	Commercially Availabe/ Experimental Material	Evaluation	
				Gel	Solution			Penetration	Inhibition of Demineralization
2001	6	27	Human	x		H_3PO_4 (10%; 15 s)	Com./Exp.	Yes	Yes
2002	7	40	Human	x		H_3PO_4 (36%; 5 s)	Com.	Yes	*Not studied*
2003	8	15	Human	x		H_3PO_4 (37%; 60 s)	Com.	*Not studied*	Yes
2004	9	10	Human	x		H_3PO_4 (35%; 120 s)	Com.	Yes	*Not studied*
2005	10	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes	*Not studied*
2006	11	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes (prolonged application time)	*Not studied*
2006	12	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes	Yes
2006	13	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes	Yes (not with all resins)
2007	14	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes (high penetration coefficient)	*Not studied*
2007	15	27	Bovine		x	H_3PO_4 (20%; 5 s)	Com.	Yes (high penetration coefficient)	*Not studied*
2008	16	40	Bovine		x	H_3PO_4 (37%; 5 s)	Com./Exp.	Yes (high penetration coefficient)	Yes
2011	17	120	Bovine		x	H_3PO_4 (35%) HCl (15%)		high bond strengths (infiltrant/conventional adhesive	*Not studied*
1975	18	24	Human	Artificial/natural lesions		H_3PO_4 (50%)	Exp.	Yes (if surface etched)	*Not studied*
1976	19	25	Human	Natural lesions		HCl (1 N; 5/10 s)	Exp.	Yes	*Not studied*
2007	20	30	Human	Natural lesions		HCl (15%; 120 s)	Exp.	Yes (best with HCl etching)	*Not studied*
2008	21	40	Human	Natural lesions		HCl (15%; 120 s)	Com./Exp.	Yes (high penetration coefficient)	*Not studied*
2010	22	84	Human	Natural lesions		HCl (15%; 120 s)	Com.	*Not studied*	Yes (high penetration coefficient)
2010	23	64	Human	Natural lesions		HCl (15%; 120 s)	Com.	Yes (high penetration coefficient)	*Not studied*
2005	24	50 Patients	Clinical	Human		H_3PO_4 (37%; 60 s)	Com.	Test group: 93% no progression. Fluoride group: 88% no progression.	
2006	25	82 Patients	Clinical	Human		H_3PO_4 (37%; 60 s)	Com.	44% of the test group and 84% of the control progressed	
2010	26	9 Panelists	*In situ*	Bovine		H_3PO_4 (37%; 5 s)	Com.	Infiltrated lesions showed significantly lesser progression than controls	
2010	27	50 Children	Clinical	Human		HCl (15%; 120 s)	Com.	Resin infiltration/FV over FV alone >35%	
2010	28	22 Patients	Clinical	Human		HCl (15%; 120 s)	Exp.	Infiltration of proximal caries lesions reduced lesion progression	

Moreover, the role of possible remineralization inhibitors is not clearly understood; the ability of albumin to bind and to inhibit growth of calcium phosphate crystals raises the question as to the possible role of such molecules in the development of carious lesions. Not-withstanding, mucins have been shown to inhibit demineralization, and to promote remineralization (for compilation, see[1]). With proximal caries, it has been argued that once a lesion is cavitated, it cannot longer be cleaned with flossing by the patient and, hence, tends to progress (albeit slowly),[29] since the con-stantly metabolically active biofilm cannot be controlled. Therefore, from this threshold an operative intervention is generally recommended to prevent further lesion progression. Unfortunately, the bitewing radiograph does not give any direct infor-mation on the surface integrity of proximal lesions. Clinical studies found comparably few cavitations in R3 (radiolucency reaching the outer dentin on bitewings) lesions (22–52%), while several laboratory studies confirmed a considerably earlier cavi-tation, with breakdown of surfaces in up to 100% of R3 lesions (for review, see references [29] and [30]).

Interestingly, gingival bleeding is known to be related to situations with progressing proximal caries, and, according to the thoughts presented here, possibly with breakdown of surfaces (and higher accumulation of plaque). With this in mind, it should be emphasized that caries is a multifactorial disease, but dental plaque remains the only relevant cause. Indeed, this might be an explanation for the slow (but often constant) progression of proximal lesions.

THE RESIN INFILTRATION TECHNIQUE

Laboratory Studies on Lesion Penetration

With an initially demineralized caries lesion, the tiny porous openings and widened intercrystalline spaces act as diffusion pathways for acids and dissolved minerals. Based on these insights, it is possible to infiltrate incipient lesions with other liquids, i.e. with low viscous resins (Figs. 1b and 2). Thus, instead of removing the porous carious tissue at a relatively late stage in the disease process, successful attempts to "fill" the microporosities of lesions at a much earlier stage of lesion development have been documented.

The infiltration technique allows for reducing the microporosities (and therefore will hamper access of acids), and is capable to strengthen the demineralized tissue by mechanical support.[17] Early descriptive studies from the 1970s[18, 31] indicated that the adhesive encompasses the residual (in)organic materials of the demineralized portions, thus transforming the lesion into an acid-resistant unit.[18] While artificial lesions can be infiltrated with a comparable outcome, natural white spot lesions have to be acid-etched prior to infiltration.[18, 19, 32, 33] This obviously is due to the thickness and the low porosity/the high mineral content of the surface layer (see above), and due to organic substances to be found in natural caries. However, it was found that a resin infiltration depth of 60 µm was sufficient to prevent further demineralization.[18] In a pioneering attempt on resin infiltrants, well-defined requirements for potentially useful materials were characterized.[19] These should be:

- hydrophilic;

- highly surface-active and with low viscosity;
- bacteriostatic;
- non-toxic to oral tissues;
- polymerizable to a solid state;
- resistant against chemical and mechanical chal-lenges of the oral cavity;
- cosmetically acceptable.[19]

Successful infiltration of materials into lesions was demonstrated using resorcinol-formaldehyde which, however, was clinically unacceptable. Nevertheless, the results showed that up to 60% of the lesion pore volume had been occluded following infiltration and that this treatment was capable of reducing further acid demineralization.[19]

Some commercially available adhesives have been shown to be suitable for infiltration of artificial subsurface lesions as well,[7, 10, 11] but significant differences could be revealed, when infiltrants with differing penetration coefficients were used.[14, 15] This has been corroborated with natural lesions,[16, 20, 23] thus indicating that resin infiltrants with high penetration coefficients are able to penetrate more deeply into subsurface lesions. In Fig. 2, a typical example of a resin infiltrated natural lesion (extending to dentin) is shown. With etched enamel, penetration of an unfilled resin was considerably influenced by the degree of dental hard tissue mineralization. Resin tags in demineralized enamel were significantly longer (some 60 µm) than in other groups, and penetra-tion decreased significantly in remineralized areas or after use of fluoride; however, this was still significantly deeper than in control sites, and remineralized enamel also allowed good penetration of the unfilled bonding agent.[9] However, with subsurface lesions, a complete infiltration of all porous structures obviously does not seem possible (compare Figs. 1c and 3); at present, reasons are unclear, and more research is clearly warranted.

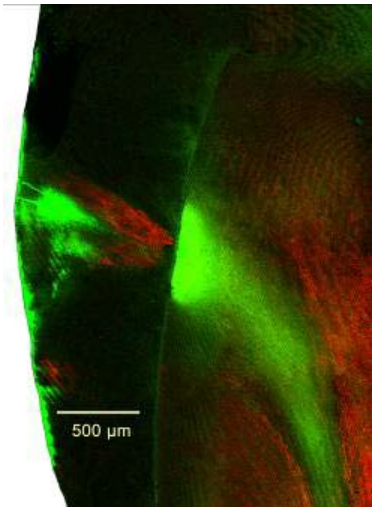

Fig. 2 Confocal laser scanning micrograph of an advanced lesion (not confined to outer enamel), depicting the principle of resin infiltration into subsurface lesions *and* into the dentin lesion (resin-infiltrated parts of the lesion indicated in green color; resin infiltrant labeled with fluorescent dye, fluorescein isothiocynate). Note that at deeper enamel lesion aspects, parts of microporosities have not been occluded (red color, labeled with Rhodamine B).

Recently, it has been shown that conventional phosphoric acid-etching (if used alone) has some limitations, and a deproteinization pretreatment using sodium hypochlorite (5.25%; 60 s) before etching revealed favorable results with regard to the retentive surface.[34] Various modifications (in addition to acid concentration and etching time) of the application technique have been proposed to improve the penetration depths in sound but etched enamel. Ultrasonic treatment during etching procedure and drying of etched fissures by means of acetone increased the mechanical interlocking considerably.[35]
The additional use of alcohol has also been advocated to dry the lesion areas,[7] and the mentioned measures might be

beneficial for infiltration of natural lesions. Future studies should evaluate these additional pretreatment regimens with regard to a potentially increased penetration depth of resin infiltrants.

Laboratory Studies on Lesion Progress

Since the initial studies mentioned above[18, 19, 31] the initiative to arrest caries by infiltration of resins has been followed extensively. Several recent studies on artificial caries-like lesions have demon-strated that commercially available adhesives having infiltrated the micropores of the demineralized areas revealed a considerable reduction of lesion progression by either single or double application, or by extended penetration times (30 s compared to 15 s).[6, 9, 12, 13, 21-23]

Using infiltrants with high penetration coefficients facilitated inhibition of lesion progression, thus showing that resin infiltration sufficiently oc-cludes the acids' pathways, and hampers demine-ralization.[16, 20, 21, 23]

This beneficial effect could be confirmed even after thermocycling; when placed on acid-etched surfaces, the resin adhered firmly to the enamel with no evidence of demineralization or enlargement of previously demineralized areas underneath the sealants (Table 1).[8]

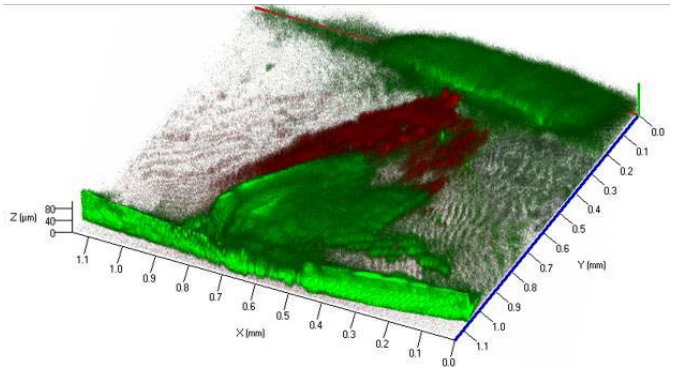

Fig. 3 Tridimensional imaging of the lesion already known from Fig. 2. Consecutive CLSM sections of the lesion have been collected without the preoperative effort of serial sectioning. Post-processing and rendering of z-stacks enhanced visual saliency and displayed the reconstructed 3D volume of both the infiltrated enamel and the "filled" dentin lesion (green). Note that at deeper enamel lesion aspects, parts of microporosities have not been occluded (red color, labeled with Rhodamine B), thus indicating that the dentin lesion has been infiltrated via pathways not visible with this tridimensional detail. Discontinued outer lesion surface (see arrow) indicates that the resinous infiltrant was not capable to induce an adequately smooth surface.

In vivo Studies Proving the Infiltration Concept

A recent SEM study on in vivo sealed (Clinpro Sealant; 3M ESPE; with and without a preceding bonding) natural subsurface lesions demonstrated an irregular resin network with twisted and curved tags, while with the sound enamel areas a regular etching pattern was observed. Resin tag lengths were considerably short, and ranged from 4.2 µm to 5.5 µm. No increased penetration depths could be observed after the additional use of a low viscous adhesive bonding agent (Single Bond; 3M ESPE). It should be emphasized that no further

pretreatment of enamel was performed, and acid etching of the surface zone was done with a phosphoric acid gel.[36] Nevertheless, a physical barrier was formed, with protective function against exposure of acids from bacterial origin, and cutting off possibly remaining bacteria (within an advanced lesion) from a nutritional supply of fermentable carbohydrates.[37]

This was corroborated in a clinical study on sealed (Gluma One Bond; Heraeus Kulzer; or Concise Sealant; 3M ESPE; 18 months, 72 patients) proximal early active lesions. As validated by subtraction radiography, 43.5% of the sealed proximal lesions had progressed over the 18-months study period, while 84.1% of the untreated controls (flossing) showed increased demineralization depths,[25] thus indicating a reduced (but not an arrested) progression rate of the procedure. Interestingly enough, deeper test lesions showed lower progression rates (33%) if compared to untreated control sites, thus reemphasizing the results already known from fissure sealants to some extent. From these observations, it might be speculated whether lesion arrest over longer periods after infiltration is due to reduced microorganism viability and/or physical barrier against acids from bacterial origin. Another clinical study on sealed (Concise Sea-lant; 3M ESPE; 2 years, 50 patients) proximal surfaces revealed that only 7-8% of the sealed lesions showed progression, if compared to a 12% rate in the control group (fluoride varnish).[24]

This study did not use subtraction radiography for evaluation; thus, the evaluated values are best comparable to the individual visual assessment values of the study mentioned above; here, the corresponding values were 9.7% and 26.4%, respectively. 25 In total, these results show a tendency that would be comparable with the outcomes of a recent study on occlusal fissure sealing; here, caries progression was highest in the control group, and this was followed by the fluoride varnish and the sealing group as well.[38]

However, these studies used a concept aiming on a technique resembling more or less the traditional fissure sealing concept, thus utilizing an additive regimen; similarly, a recent clinical study on (proximal) adhesive patches showed promising results since lesion progress was predominantly arrested and remained stable over a 2-year period, even after loss of the patch, and this indicated the apparently positive effects of the underlying bonding material. Notwithstanding, using adhesive patches is deemed a classical approach, too.

In contrast, clinical studies using a true infiltration regimen (Icon; DMG) are rare. In a recent in situ study (including 9 panelists), the infiltrated and positive control lesions showed significantly less progression compared to the untreated controls, and it was emphasized that resin infiltration was effective in hampering (but not arresting) lesion progression, even without a covering resin coat.[26]

In a 1-year clinical study (50 patients) on deciduous molars, 23% of the infiltrated (and fluoride varnished) lesions and 62% of the (only flouridated) control lesions had radiographically progressed. This difference was highly significant, and the therapeutic effect of both resin infiltration with Icon/fluoride varnish with Duraphat over Duraphat alone was more than 35%. Thus, the resin infiltration concept in conjunction with a fluoride varnish would seem a promising approach to control for proximal lesion progression, thus complementing the concept of minimum intervention dentistry.[27]

This tendency was corroborated in an 18-months efficacy trial with 22 young adults. Here, in the effect (resin infiltration) group, 2/27 lesions (7%) had progressed, while in the control group (placebo) 10/27 lesions (37%) showed progression. Infiltration of interproximal caries lesions was considered efficacious in reducing lesion progression, but, again, only borderline significance was reached, when pair-wise comparisons were calculated.[28]

INFILTRATION: UNSOLVED PROBLEMS

From the majority of laboratory and clinical studies, it seems clear that resin infiltration of subsurface lesions will sufficiently occlude any microporosity caused by demineralization. However, lesion progress will be hampered only, and in many cases a total arrest will not be achieved. Undoubtedly, this is a major improvement if compared to other non-invasive treatment regimens (such as flossing and fluoridation only). Notwithstanding, several challenges have to be faced with the infiltration concept. First, removing (or altering) the pseudointact surface layers of natural caries lesions by etching with hydrochloric acid will also affect adjacent sound enamel. This will lead to a significantly roughened surface, along with substance loss that will be recolonized with cariogenic bacteria. Figure 4 gives a representative example of an etched natural caries surface. Second, we could recently show that removal of excess material before light curing seems recommendable to simplify the treatment procedure and to avoid any unexpected abrasion resulting from the use of abrasive strips.[39] However, surface quality of infiltrated lesions was perfectible,[40] and roughness of non-processed surfaces was not in a range considered acceptable. Again, this might facilitate plaque accumulation (Fig. 5). Third, to envision the infiltration concept, it should be emphasized that resin infiltrants are capable to penetrate deeply into the porous bed of an initial lesion (compare Fig. 3).

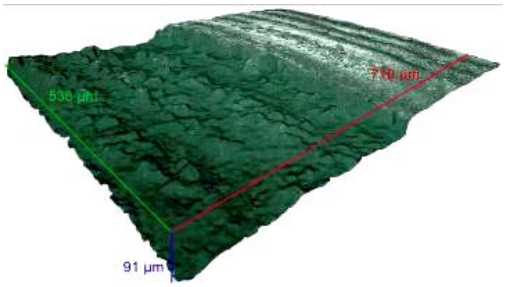

Fig. 4 Tridimensional topography image (as captured by a focus variation 3D microscope) of the boundary region between sound enamel and subsurface lesion (lower left region) after etching with hydrochloric acid for 2 min. Note the clear loss of height and the deep trench close to the borderline, indicating removal of tens of micrometers of outer enamel.

Fig. 5 Surface characterization of a caries lesion after infiltration with Icon. This optical 3D micrograph illustrates the entire surface topographic information. Surface breakdown has neither been filled up, nor it has been smoothed by the resin, thus future plaque accumulation seems possible. Note the sound enamel regions with accentuated prisms due to the etching procedure (magnification 20×).

This inevitably leads to a hybrid mixture of demineralized enamel

prisms and a circumfluent polymerized network of the resin infiltrant. However, the infiltrant will not build a smooth top coat on the lesion's surface (and any resinous remnants will be lost, due to mechanical action later on). Thus, the embedded enamel prism remnants will be susceptible to further demineralization (and, subsequently, to a lesion progress). Figure 6 presents a detailed view onto a natural caries lesion in true colors.

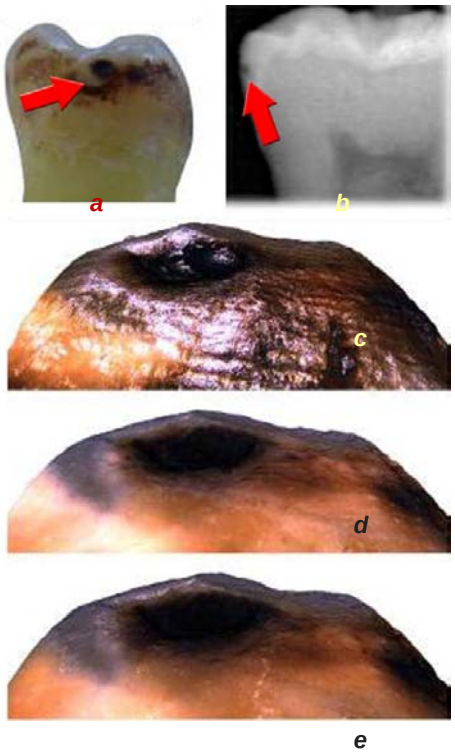

Fig. 6 Macroscopic view (*a*) and respective radiograph (*b*) of inter-proximal caries (mandibular molar; R2 lesion). Longitudinal true color 3D imaging of untreated (*c*), etched (*d*), and infiltrated (*e*) lesion reveals a non-filled surface with a dished end (magnification 5×).

Finally, it has to be stressed that any non-planished surface breakdown will reduce cleaning efficacy of oral hygiene procedures; the concomitant biofilm accretion will endanger periodontal health, in particular promoting gingivitis, and increasing the risk of secondary caries and demineralization of the adjacent tooth.

Thus, a two-step treatment regimen should be taken into account, which can be defined as to obtain a good penetration depth into the porous bed of initial lesions with the use of low-viscosity resin materials (such as Icon) and to additionally cover the infiltrated lesion surface with a resinous material that should enhance surface properties. From the thoughts given above it seems obvious that more research in this field is clearly warranted.

Advantages Of The Infiltration

Caries related clinical decision-making remains a centerpiece of clinical dentistry. However, most dentistry still is redentistry (with continued restorative procedures necessary within the life span of the patient), and the traditional core skills, along with the manual dexterity and technical competence, have less to offer to oral health than many of us have been accustomed to think. From the foregoing review it seems clear that (in face of the deficiencies described above) the resin infiltration technique bears several advantages.[1]

These include:

- mechanical stabilization of demineralized enamel;
- preservation of sound hard substance (protection of both the same and the adjacent tooth);
- permanent occlusion of superficial micropores and cavities;
- obturation of porous, deeply demineralized areas;
- Arrest/retardation of lesion progress;
- minimized risk of secondary caries;
- delay of restorative intervention for longer periods;
- no risk of postoperative sensitivity and pulpal inflammation;
- reduced risk of gingivitis and periodontitis;
- improved esthetic outcome when used as a "masking" resin on demineralized

labial surfaces (white spot lesions, i.e. with orthodontic patients); and
- high patient acceptance.[1]

In particular with regard to Figs. 5 and 6, it seems clear that when regarding the impact on the clinical decision process, a longitudinal clinical risk assessment to discriminate between progressive and remineralized lesions should be established. Within the concept of minimal intervention dentistry,[1] the infiltration approach seems suitable in case of early treatment decision needs; at the same time, even for later stages of the caries process (in case remineralization with fluorides is not considered a viable approach) this concept should be an alternative to any type of cavity preparation, thus at least postponing (if not avoiding) sacrifice of sound structures.

For protection reasons, and to ensure dryness, use of rubber dam is strongly recommended with the resin infiltration technique. Finally, resin infiltrants can be combined with conventional resin restorations in case of more complex treatment situations,[1, 17] and this should help preserving dental hard tissues.

CONCLUSIONS

With regard to the implications for practice, unfilled resins with high penetrations coefficients (infiltrants) obviously have a favorable penetration potential in subsurface enamel lesions. In view of the results presented in the current review, the resin infiltration technique is a very promising microinvasive approach to preserve (demineralized) enamel. With a careful application technique, lesion progress will be hampered (or arrested); however, the infiltration concept should only be performed on a supervised basis, and fluoridation regimens must be continued. With the patients' followups, reinfiltration is possible if necessary, thus closing the gap between oral hygiene and minimally invasive dentistry, and providing a wait-and-see position to both the clinician and the patient.When reflecting on the implications for research, the number of clinical trials was small. Therefore, more high quality research is needed to evaluate to what extent there is a difference in the effectiveness of infiltrated lesions and sites to be preserved by oral hygiene/fluoride programs; the carryover effect of fluoride applications cannot totally ruled out, and RCTs with a parallel group designs seem mandatory. Moreover, there is need to study the reasons for lesion progress, both in vitro and in vivo; mechanical, chemical, and biological behavior of materials used as infiltrants, together with variations of application procedures (repeated application after different time intervals, possible needs for reinfiltration regimens within preventive orientated recalls) are considered fields of major interest.

ACKNOWLEDGEMENTS

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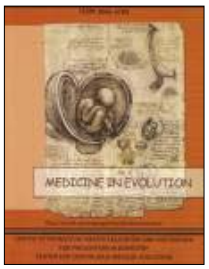
THE USE OF MICROSURGICAL "TUNNEL" TECHNIQUE IN THE GROWTH OF WIDTH AND THICKNESS OF THE MARGINAL GINGIVA



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ABSTRACT

Objective: *The connective tissue grafts have been initially used for the width augmentation of the gingiva, and later for its thickness and for the covering of root retraction and the soft tissue augmentation of the alveoalar crest.*

Material and methods: *A number of patients have been operated and the width and gingival thickness recorded, using the classic Langer&Langer technique, but also the new microsurgical tunneling technique (Allen). 3 months after the surgeries, all the parameters have been again recorded.*

Results: *Using these surgical techniques, the Langer&Langer and the microsurgical tunneling with connective tissue grafts, the graft recive a double vascularisation from the inner layer of the flap and from the underlying periosteum, leading to a optimal surgical outfit in terms of colour and estethics.*

Conclusions: *The marginal gingival width and thickness can be maximized with the help of connective tissue grafts, being a predictable surgical technique. It can be aplyed to an increased number of teeth and because of the harvesting and transplantation technique, the healing occurs uneventfull and the postoperative discomfort of the pacient is minimal.*

Key words*: attached gingiva, connective tissue grafts, tunneling technique*

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INTRODUCTION

The original rationale for mucogingival surgery was predicted on the assumption that a minimal width of attached gingiva was required to maintain optimal gingival health[1].

However, several studies have challenged the view that a wide attached gingiva is more protective against the accumulation of plaque than a narrow or a nonexistent zone. No minimum width of attached gingiva has been established as a standard necessary for gingival health.[2] Persons who practice excellent oral hygiene may maintain healthy areas with almost no attached gingiva. Widening the attached gingiva accomplishes the following three objectives:

1. Enhances plaque removal around the gingival margin.
2. Improves esthetics.
3. Reduces inflammation around restored teeth.

To simplify and better understand the techniques to increase attached gingiva and the result of the surgery, the following classifications are presented: Gingival augmentation apical to the area of recession. A graft, either pedicle or free, is placed on a recipient bed apical to the recessed gingival margin. No attempt is made to cover the denuded root surface where there is gingival and bone recession.

Gingival augmentation coronal to the recession (root coverage).

A graft (either pedicle or free) is placed covering the denuded root surface[3,4]. Both the apical and the coronal widening of attached gingiva enhance oral hygiene procedures, but only the latter can correct an esthetic problem. For preprosthetic purposes, the combination of widening keratinized gingiva apical and coronal to the recession would satisfy this objective. There are several factors influencing the degree of root coverage: Patient-related factors (poor oral hygiene, toothbrushing trauma, smoking); Site-related factors (interdental periodontal support, the dimensions of the recession defect); Technique-related factors (thickness of the tissue flap, elimination of flap tension, thickness of the graft).

Different techniques are presented for solving muco-gingival problems[5].

The proper selection of the numerous techniques must be based on the predictability of success, which in turn is based on the following criteria:

1. Surgical site free of plaque calculus and inflammation.
2. Adequate blood supply to the donor tissue[6].
3. Anatomy of the recipient and donor sites[7].
4. Stability of the grafted tissue to the recipient site.
5. Minimal trauma to the surgical site.

MATERIAL AND METHODS:

The continuous development of operating microscopes, refinement of surgical instruments, production of improved suture materials and suitable training laboratories have played a decisive role for technique in many specialities[8]. The three elements, i.e. magnification, illumination and instruments are called the microsurgical triad, the improvement of which is a prerequisite for improved accuracy in surgical interventions.

Without any one of these, microsurgery is not possible. Periodontal microsurgery introduces the potential for a less invasive surgical approach in periodontics[9].

This is exemplified by a decreased need for vertical releasing incisions and greater use of smaller surgical sites. Periodontal surgeons, as with other microsurgeons, continue to notice the extend to which reduced incisions size and surgical retraction are directly related to decreased postoperative pain and rapid healing.

Pouch and tunnel technique

To minimize incisions and reflection of flaps and to provide abundant blood supply to the donor tissue, the placement of subepithelial donor connective tissue into pouches beneath papillary tunnels allows for intimate contact of donor tissue to the recipient site[10,11,12].

After positioning the graft, the coronal placement of the recessed gingival margins completely covers the donor tissue. Therefore the esthetic result is excellent13. This technique is especially effective for the anterior maxillary area, where vestibular depth is adequate and there is good gingival thickness.

One of the advantages to this technique is the thickening of the gingival margin after the healing. The thicker gingival margin is more stable to allow for the possibility of "creeping reattachment" of the margin. The use of small, contoured blades enables the surgeon to incise and split the gingival tissue to create the recipient pouches and tunnels[14,15].

This technique consists of the following steps (Figs.1-8).

RESULTS

Using this surgical techniques, the microsurgical tunneling with connective tissue grafts, the graft recive a double vascularisation from the inner layer of the flap and from the underlying periosteum, leading to a optimal surgical outfit in terms of colour and estethics[16] (Fig.9).

Fig.1. Initial clinical status of the gingiva

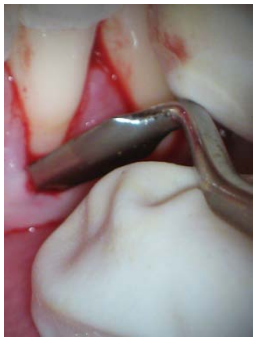

Fig.2. Sulcular incision around the teeth adjacent to the recession

Fig.3. A tunnel created beneath the adjacent buccal papilla

Fig. 4. A split-thickness pouch created apical and lateral to the papilla, which has been tunneled, and the adjacent radicular surface

Fig.5. Connective tissue graft which has been harvested from the palatal mucosa

Fig.6. The graft placed under the pouch

Fig.7. The donor tissue secured by sutures

Fig. 8. The gingival margin of the flap coronally placed and secured by holding sutures

Fig.9. Clinical result of the gingiva after 1 year

CONCLUSIONS

The marginal gingival width and thickness can be maximized with the help of connective tissue grafts, being a predictable surgical technique.

It can be aplyed to an increased number of teeth and because of the harvesting and transplantation technique, the healing occurs uneventfull and the postoperative discomfort of the pacient is minimal[17,18,19]. Mucogingival surgical procedures, performed using a microsurgical approach, improved the treatment outcomes substantially and to a clinically relevant level when compared with the clinical performance under routine macroscopic conditions[20].

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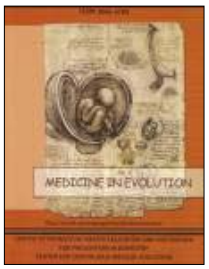
AESTHETIC REHABILITATION WITH ZIRCONIA ALL CERAMIC ANTERIOR RESTORATIONS. CASE REPORT



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ABSTRACT

Esthetic restoration of anterior teeth is a challenging clinical situation and a demanding procedure. The patient's aesthetic expectations are usually high and the final result is largely dependent on the skill and the experience of the team dentist-dental technician. This paper discuss the factors involved in the decision making process for zirconia all ceramic restorations and describes all the clinical aspects for restoring anterior teeth.

Case Report: *In this paper we present one clinical case presented in our clinic for prosthetic rehabilitation of frontal teeth. After a detailed clinical evaluation the decision was to restore the smile design with zirconia all ceramic restorations (crown, bridge and veneer) fabricated with CAM technology. The decision making process involves the consideration of a number of factors such as underlying substrate color, tooth preparation geometry, margin location and cementation system. All the clinical and technical steps are presented to demonstrate the requirements and materials necessary for the optimal resin bonded anterior zirconia crowns and bridges.*

Conclusions: *The all ceramic zirconia based restorations showed good clinical results, were well accepted by the patient and can perform a long term clinical success.*

Key words*: zirconia all ceramic restorations, aesthetic rehabilitation, clinical steps*

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INTRODUCTION

In the dental market is available a large variety of all ceramic systems and cements. They differ considerably in their relative esthetic potential, their physical properties and evidence base relative to longevity[1]. There are two basic families of all ceramic systems:

- low strength, etchable, glass based ceramics: IPS Empress and IPS emax (Ivoclar Vivadent), Authentic (Jensen, CT), Finesse (Dentsply Ceramco), traditional feldspatic porcelain.
- high strength, non etchable alumina or zirconia based ceramics. Procera (Nobel Biocare), Lava (3M ESPE), In Ceram (Vita), Zirconzahn (DCS).

The selection of the restorative material and the relative tooth preparation design should be performed only after the clinician has considered all the factors that play a role in the decision-making process.

The zirconia based ceramics have better mechanical properties, comparing to glass based ceramics that have better optical properties. Zirconia crowns have adequate independent strength and can be cemented with either conventional luting cement or resin cement [2].

It is important to understand that simply placing an all-ceramic restoration instead of a metal-ceramic restoration will not guarantee outstanding esthetics. The team dentist- dental technician must accomplish with accuracy all the clinical and technical steps to ensure success. [3,4,5]

CASE REPORT

In this paper we present the case of a young female patient discontent with her five years old porcelain fused to metal anterior bridge (11-23), who wanted a more esthetic and also functional restoration of her smile design. (Fig.1)After a correct clinical, Rx, and photographic examination we decide to perform a digital simulation of her smile design (Smilepix.software) (Fig.2). A diagnostic wax up was created in the dental laboratory in concordance with the esthetic proportions evaluated with Chu's Aesthetic Gauge (Hu-Friedy, Inc, Chicago). (Fig.3). This tool allow standardization of tooth size parameters, as well as objective communication between clinicians and auxiliaries involved in comprehensive patient care from diagnosis, case planning, provisional restorations and verification of tooth size correction to the final aesthetic restorative outcome.

The clinical decision was to replace the porcelain fused to metal fixed partial denture with zirconia anterior all ceramic crown on tooth 11, zirconia bridge between teeth 21and 23 and one veneer on tooth 12. In the followings were detailed presented all the clinical steps. After removing the old metal-ceramic partial fixed denture, provisional crowns (Fig.4) made with Acrytemp (Zhermack) were cemented with temporary zinc oxide eugenol-free cement (Temp Bond NE, Kerr). All teeth were endodontically treated prior to the preparation, and three of them received prefabricated posts (Pentron, USA). The post were cemented with composite resin and a core was built up with the same material (Build it, Pentron, USA).

The preparation of the teeth was performed with a deep chamfer (Brasseler 6878K-016). One of the most important aspects of prosthetic

rehabilitation with zirconia based crowns and bridges are the proper tooth preparation, including finish-line geometry. The margin of the anterior crowns was placed beneath the free gingival margin to produce a cervical crown ferrule on endodontically treated teeth and to improve the aesthetics of discolored teeth (11, 21, 23). The shade selection was performed with the spectrophotometer Vita Easy Shade and the tooth shade guideVitapan 3D Master (Fig.5).

A vinil polisyloxane putty and fluid (Flexitime, Kerr) was used for the wash technique impression. In the dental laboratory, the technician poured the plaster model and made the resin copings. Then the zirconia copings were milled with the Zirkograph 025 ECO with 5th axis (DCS, Germany). The zirconia copings were sintered (Fig.6) and the feldspar porcelain (Vita Lumin, Vita Zahnfabrick, Bad Sackingen, and Germany) was fused to the cores by the laboratory. The veneering thickness layer was between 1, 0 and 2 mm. (Fig.7). Zirconia crowns and bridges can be cemented using conventional luting procedures, or adhesive cementation. The decision in our clinical case was for resin bonding the zirconia crown, bridge and veneer. The abutment teeth were cleaned and prepared for the adhesive cementation with self etching resin cement (Max Cem Elite (Kerr, USA). After two years, the clinical evaluation revealed good periodontal health, unmodified appearance and the satisfaction of the patient (Fig.8).

Fig.1 The patient's smile at the presentation

Fig.2 Computer simulation of the smile design

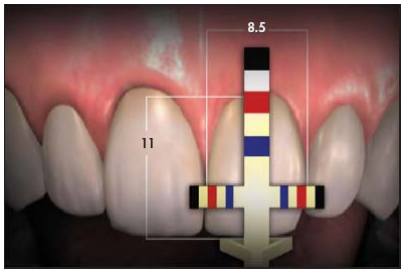

Fig.3 Chu's aesthetic gauge

Fig.4 Shade match with Vitapan 3D Master

Fig.5 Provisional restorations

Fig.6 Zirconia copings on the model

Fig.7 Zirconia crowns on the model

Fig.8 Provisional restorations

DISCUSSION

The increasing aesthetic awareness of patients has led to the development of new ceramic systems that challenge traditional metal-ceramic restorations[6]. Recent progress in restorative materials and clinical techniques, especially those in the field of adhesive dentistry, can indeed make it easier for a dentist to create natural-looking restorations. When choosing an all-ceramic system, the clinician must first ensure that the system chosen actually provides the anticipated esthetic benefit. Clinicians should not indiscriminately use an all-ceramic system until an appropriate evidence base has been established to support it.[7]

Simply using a zirconia based restoration will not ensure predictable esthetic success. Precise attention to detail with regard to tooth preparation, cervical margin design and location, soft-tissue management and impression-making are crucial to success. Proper selection of materials and the ceramist also are essential, as are correct shade matching procedures.

The modern preparation technique for zirconia crowns does not prescribe deeper preparation than for metal–ceramic crowns since the core can be made only 0.5 mm thick.

Finish lines placed beyond the cemento-enamel junction result in a significant loss of adhesion where resin cements are used and there is a greater possibility of microleakage. Ferrari et al[8] showed that the cervical margins of single unit all porcelain crowns must be considered as one of the weakest areas of this type of aesthetic restoration.

One of the most technique sensitive clinical steps is the cementation. When bonding zirconia restorations, resin bonding to the tooth structure follows the same protocols as used for other indirect bonded restorations. HF acid does not sufficiently alter the surfaces of high-strength ceramics, and conventional silane coupling agents cannot provide chemical bonds to these materials because of the lack of silica. Therefore, based on the majority of the available evidence, zirconia should be resin bonded as follows:

- activation of the ceramic surface through air-particle abrasion with a microetcher and aluminum- oxide particles.
- application of a ceramic/metal primer that contains adhesive

monomers that chemically bond to metal oxides
- application of a dual or self-cure composite resin luting agent that preferably contains the same adhesive monomer as the primer.

Another problem with resin cementation on subgingival margins is the inadequate moisture control that could compromise the entire bonding process. Recent developments are geared toward reducing the number of clinical steps and eliminating surface-altering pretreatment methods when bonding zirconia. [2]

In contrast to several reports on zirconia fixed partial denture [9,10,11] there are only few systematic studies of the clinical performance of zirconia crowns[12]. Tinschert et all [9] published controlled clinical studies of zirconia-based fixed partial denture made of DC Zirkon and conclude that are relatively low complication rates were found over a 3-year period.

Few reports with some of these systems indicate that the core materials are very fracture resistant but that a frequent clinical problem is fracture of the ceramic veneer of the core material.[13]

Concerning the survival rates of all ceramic crowns versus metal ceramic crowns, Pjetursson &all [14] conclude the need for published independent clinical trials after an observation period of at least 3 years.

CONCLUSIONS

The marginal gingival width and thickness can be maximized with the help of connective tissue grafts, being a predictable surgical technique. It can be aplyed to an increased number of teeth and because of the harvesting and transplantation technique, the healing occurs uneventfull and the postoperative discomfort of the pacient is minimal[17,18,19]. Mucogingival surgical procedures, performed using a microsurgical approach, improved the treatment outcomes substantially and to a clinically relevant level when compared with the clinical performance under routine macroscopic conditions[20].

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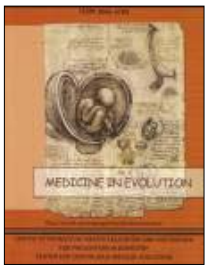
SURFACE X RAY DOSES COMPARISON STUDY FOR CONVENTIONAL AND DIGITAL RADIOLOGY EQUIPMENT IN PEDIATRIC RADIOLOGY



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ABSTRACT

Because of the greater children sensibility to X-rays we have evaluated the received X rays doses for pediatric thorax examinations on groups separated on age criteria and image detectors; bath classic film and light enhancer and digital systems. Determination place was a pediatric clinic.

We selected two X-ray machines from the same generation, both with anatomic programmator and automatic exposure control (AEC). Received X ray doses are measured with a measuring ionization chamber mounted on the X ray collimator, results are expressed in doses×area. From all examinations we have selected the thorax in PA-AP projection. The age groups are: <1 year, 1 -3, 4 -7, 8 – 11, 12 -16.

Registered data: patient age, working tension (kV), examination field size and DAP (doses area product). For the working tension analysis, we followed the mode value and for DAP the average value. The X ray machine with digital detector generates through the anatomic programator a value of 110kV for all age groups and a DAP value between 6, 1 and 49,8µGy×m2. The classic X ray machine generates through the anatomic programmator tensions of 65, 73, 77, 90 and 102kV, a DAP value between 3 and 8,3µGy×m2.

We have supplementary measured the dose on the patients entering surface motivated by the great difference of the DAP values between the two types of detectors. The previous obtained DAP values have been confirmed with the second method too. Deeper research is necessary to determine the cause for the great differences of DAP values.

***Key words**: sensibility to X-rays, X rays doses, doses area product.*

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INTRODUCTION

The result of the radiological examinations is a non-uniform distribution of the X ray doses in the human organism. For example, the exit doses is about 1% of the entrance doses so the organs that are not in the path of the X ray beam also receive some radiation through the scattered radiation. When a patient undergoes a thorax examination it is relatively easy to measure or calculate the entrance dose or the dose at the skin level. The skin level dose is necessary for predicting the deterministic effects like skin burns or depilation. The deterministic effects appear at a dose of approximately 2 Gy. They are rare in the diagnostic radiology (0, 01%), but they appear more often in interventional radiology[1]. The risks of the patient in 99,99% of the diagnostic X ray examinations are the stochastic processes of carcinogenesis and the induction of genetic effects at the patients' children. The doses given to the patients during the X ray examination are usually small and well bellow the doses necessary to induce deterministic effects (attributed to the patient; with a dose threshold, the severity of the effects rises proportionally with the dose value). The skin level dose does not measure the patient's risk because they do not take into consideration the size of the irradiated zone, the penetration power of the radiation or the radio sensibility of the irradiated organs and tissues. A dose descriptor for use in imagistic radiology must consider all these. The effective dose is usually taken at the best descriptor for quantifying the radiation dose received by a patient exposed at a certain type of examination. The use of the effective dose gives the possibility to compare all the radiological procedures that use ionizing radiations with only one unit of measure. The estimation of the effective dose from the entrance dose or from the dose-area unit of measure is realized by the use of some conversion coefficients [2,3,4]. These are obtained by the Monte Carlo modeling and allow a precise estimation especially by using the dose x area unit of measure.The dose-area unit of measure can be calculated from the exposure parameters or by measuring during the examination. The dependence of the surface dose to the exposure parameters can be formulated by this relation: $R=\alpha\times(kV)\beta\times mAs$; where R is exposure (in, for example, μGy) at a given distance from the X ray unit, and where the parameters alpha and beta vary from machine to machine and depend on generator type, anode material and filtration. The actual generation generators' parameters are $\alpha \approx 9$, $\beta \approx 2$.[5]

The radiologic examination of the child considers:

- the anatomical, pathological, biochemical and physiologic particularities by age group;
- the higher sensibility to ionizing radiation at child than at adult.

MATERIAL AND METHOD

The place of the study is a pediatrics clinic which realizes a great variety of emergency, ambulatory ad hospital examinations. The radiology compartment respects work procedures[6] and a system to ensure the quality of X ray examinations[7].

Two X ray machines were chosen. They are from the same generations and they are made by renowned

brands (Phillips, Swissray). Both machines have an anatomical programmator and AEC. The anatomical programmators are made using different principles. For the screen-film detector machine there are selected anatomical regions and pediatric age groups.

For the digital detector machine there are selected anatomical regions and 2 dimensional choices- child and adult. The screen –film detector, the film processor and the developing solutions are all made by Kodak. The photographic material transformation process has respected the producer's demands[8]. The digital detector is made from 4 CCD cameras each connected by optic fiber to a CsI scintillator.

The 4 resulting images are united to form a 36x43 cm field (Add-On Bucky). The radiographic image is exposed on an LCD monitor.

The radiation generating tube's applied tension is the one recommended by the anatomical programmator of each of the two machines.

These tensions consider the physical dimensions of the patient used currently in diagnostic dosimetry[9].

Table 1 The mAs value from the formula (1) is given by the AEC.

Age (years)	Weight (kg)	Trunk thickness AP (cm)
0	3,5	9,8
1	9,3	13,0
5	19	15,0
10	32	16,8
15	54	19,6

The doses given to the patients during the radiological procedures are evaluated with a transparent plan-parallel transmission ionization chamber mounted on the machine's collimator and given in the dose-area unit of measure [10]. The kerma-area product is the product of the dose (kerma) value of the incident radiation and the irradiated field size. Due to the inverse square-law dependence of the dose value, the focal spot distance cancels out when calculating the KAP, i.e., it can be determined or measured at any distance from the focal spot, provided that the full beam is covered. A DAP-meter usually consists of three plastic plates, typically PMMA or similar material of thickness 1-2 mm, to a total thickness of 4-6 mm. The plates are covered with a thin conductive coating, typically made of indium oxide doped with tin (In2O3:Sn) due to its transparency to light. The total thickness of the air layers (sensitive layers) in a modern DAP-meter is about 12-13 mm. The measuring devices used, called DAP-meters are from the same type are made by the same producer (Kerma X). The presence of the detector does not influence the radiological examination. Both DAP-meters were initially calibrated by the producer.

Fig.1 Removable DAP-meter mounted in front of collimator.

The total uncertainty of a DAP-meter measurement is 25% at a level of trust of 95%. This corresponds to the application of a single value for the calibration factor, at all doses and X ray energies possible in clinical practice, which simplifies the determinations [11]. The uncertainty can be reduced at 7% at a level of trust of 95%, when the tube tension, filtration and chamber response energy dependence are known[12].

From the initial 5000 radiological examinations made, there were selected only the thorax examinations with the PA-AP projection. The patients were split into age groups (less than 1 year, 1-3, 4-7, 8-11, 12-16 years) to compare the results with older studies [13,14]. Smaller accessibility at the digital detector X ray machine makes the size of the patient groups to be different (261 and 971 patients).

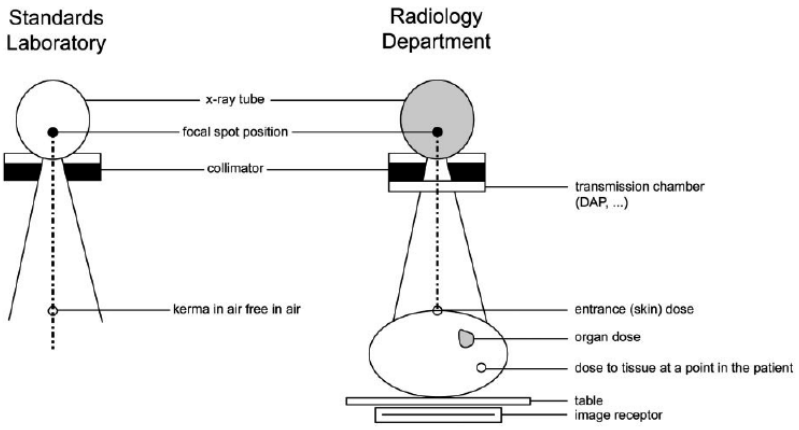

Fig.2. Schematic diagram of the geometrical set-up of the instruments for measuring dose-area product (KAP)

Measurement and Results

There were registered the age of the patient, the working tension (kV), the examination field size and DAP (doses area product). For the analysis of the work tension the modal value was used and for the DAP, the mean in case of a normal dose distribution or otherwise the median value. The values obtained were processed using the Data Analysis option from Excel.

Results

The age group based distribution of the patients indicates higher numbers of children aged 1 to 3 for both machines.

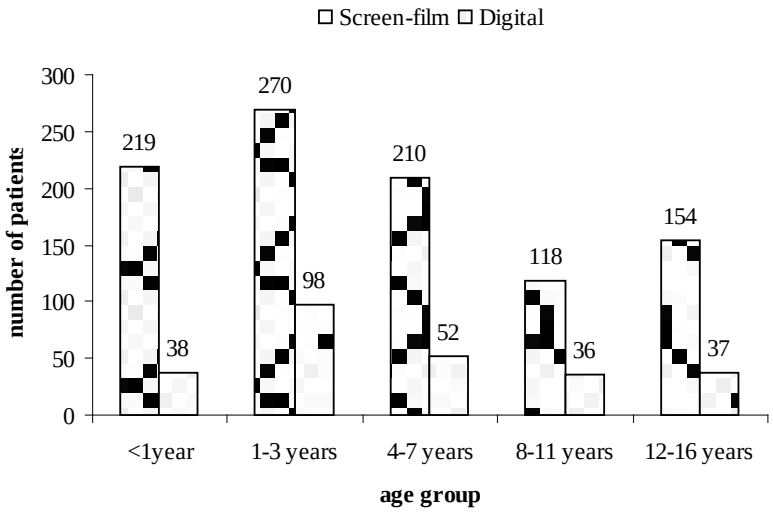

Fig.3 Age groups. The ratio between the number of patients per age group on both machines is between 2, 8 (1-3 years) and 5, 8 (less than 1 year).

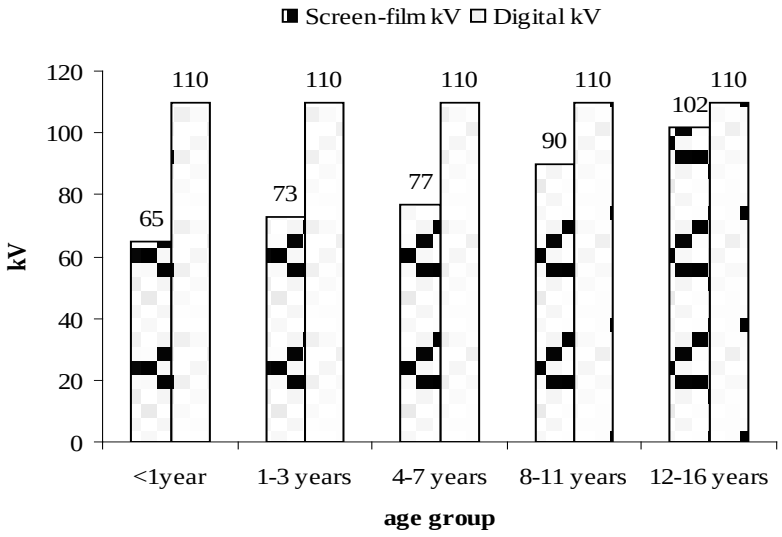

Fig. 4 Applied tensions to the tube. The tension applied to the tube of the digital detector machine has given through the anatomical programmator a tension of 110kV for all age groups.

Table 2 Using the anatomical programmator at the screen-film detector machine the following tensions were obtained: 65, 73, 77, 90 and 102kV.

	Digital					Screen-film				
DAP	µGy×m²					µGy×m²				
Age group	<1	1-3	4-7	8-11	12-16	<1	1-3	4-7	8-11	12-16
Mean	6,1	9,3	11,1	29,3	49,9	3,0	4,0	4,9	5,4	8,4
Median	5,5	7,5	8,1	15,2	20,3	2,3	3,3	4,0	4,5	5,2
Mode	6,3	13,2	7,2	19,5	19	2,3	4,2	3,2	2,5	4,2
Standard Deviation	3,2	5,1	10,6	32,8	81,2	3,1	3,2	3,7	3,6	17,6
Skewness	1,3	1,6	3,7	1,9	2,9	4,8	3,6	3,6	2,7	8,7
Minimum	0,2	3,3	2,5	4,1	0,7	0,4	1,0	1,1	1,1	0,4
Maximum	16,7	28,3	67,4	125,9	315,3	28,0	24,0	28,0	24,3	191,2
Number of patients	38	98	52	36	37	219	270	210	118	154

Table II The result of the analysis

The distribution of values depending on the age groups is not a normal distribution.

It is not necessary to verify the normality through a mathematical method. Some DAP values are very small but a correct diagnostic was given without repeating the procedure. The obtained image quality is not very good. There are also big values. In that case, the procedure was not repeated because of the possible overexposure. The 1-3 years age group was chosen to observe the distribution of the DAP values. The histograms show the patients split into DAP values intervals.

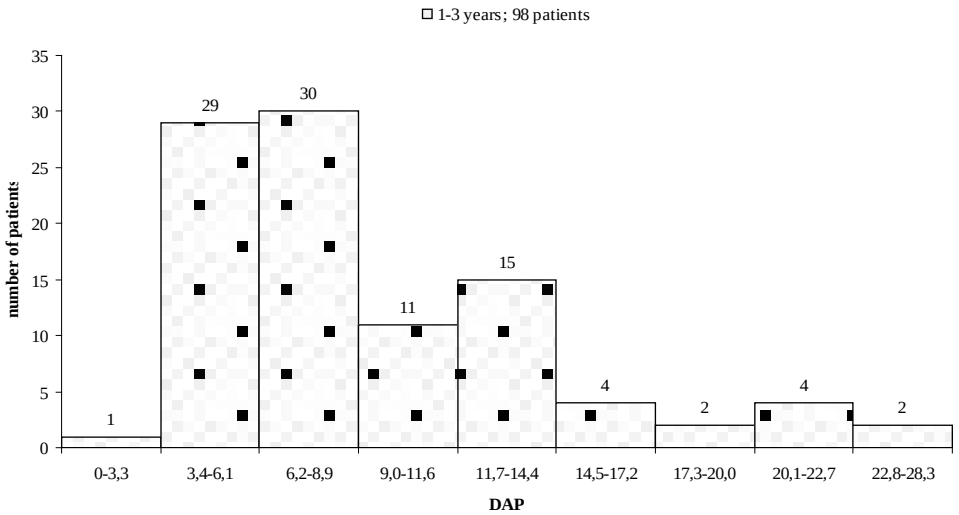

Fig.5 The histogram of the DAP values for the digital detector, 1-3 years. For the age group with the biggest number of patients (1-3 years) with the digital detector. About 30% of the patients (7,5±1,4 µGy×m2) are situated between 6,2-8,9 µGy×m2.

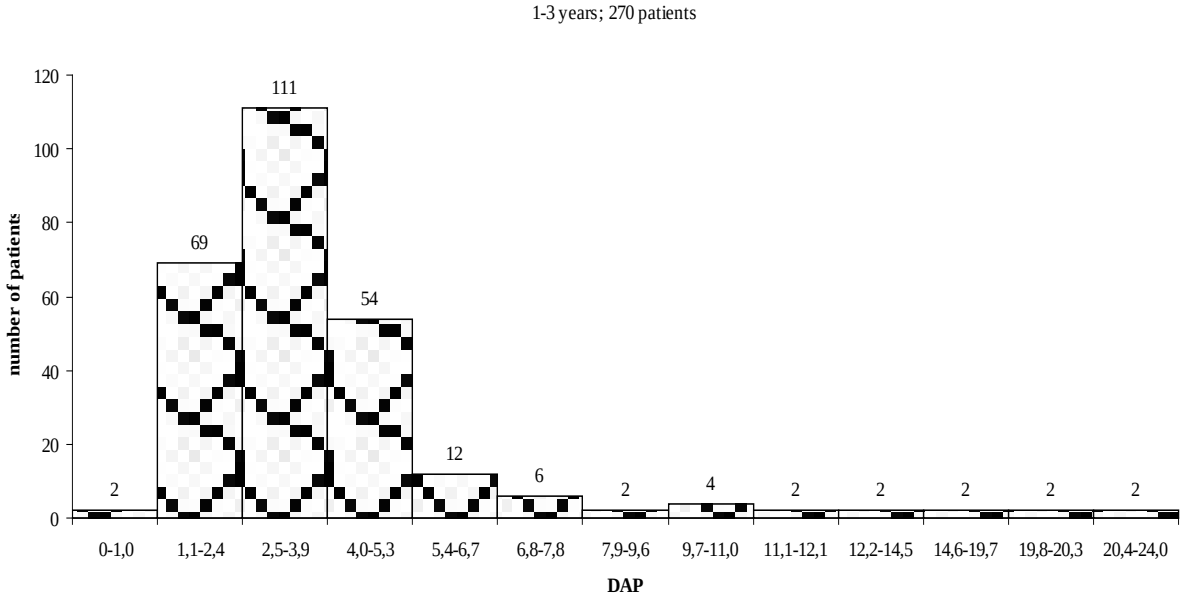

Fig.6. The histogram of the DAP values for the screen-film detector, 1-3 years. For the age group with the biggest number of patients (1-3 years) with the screen-film detector. About 41% of the patients (3, 3±0,6 µGy×m2) are situated between 2, 5-3, 94 µGy×m2 . For the two detector types different variations of the median DAP value can be seen.

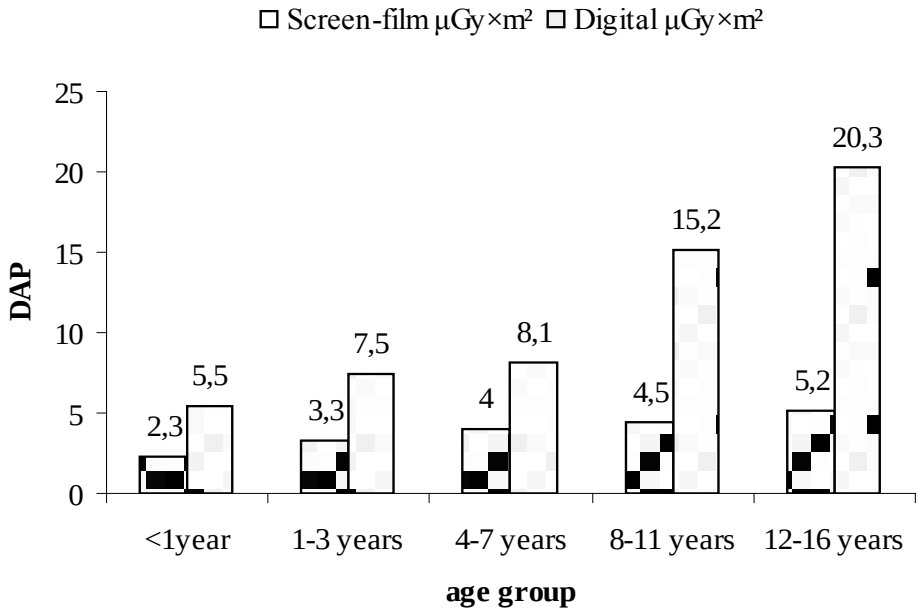

Fig.7. The histogram of the median DAP values. For the digital detector the increase is from 5, 5 µGy×m2 to 20, 3 µGy×m2, at approximately 3, 7 times with an exponential variation. For the screen-film detector the increase is from 2, 3 µGy×m2 to 5, 2 µGy×m2, at approximately 2, 3 times with a small slope linear variation. The variation of the median DAP values depending on the age group was also analyzed.

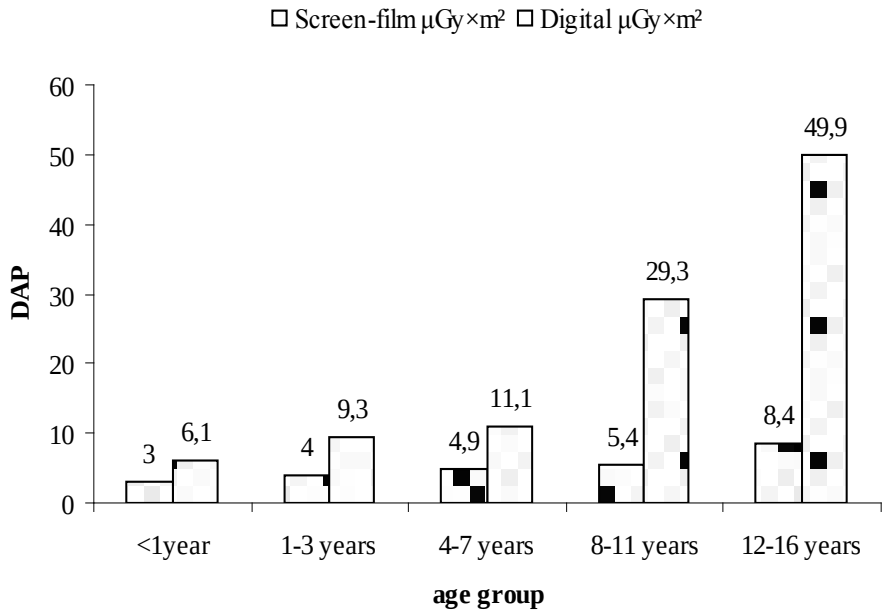

Fig.8 The histogram of the mean DAP values.

For the digital detector the increase is from 6, 1 µGy×m2 to 49,9 µGy×m2, at approximately 8,2 times with an exponential variation. For the screen-film detector the increase is from 3 µGy×m2 to 8, 4 µGy×m2, at approximately 2, 8 times with a linear variation. The results can be expressed like a prediction of the exposure values for the patients that will be investigated.

The digital detector machine provided (through the anatomical programmator) a tension of 110kV for all age groups and for a mean DAP value situated between 6, 1-49,9 µGy×m2. At the screen-film detector (using the anatomical programmator) there were obtained tensions of 65, 73, 77, 90 and 102kV and a mean DAP value between 3-8, 4 µGy×m2.

Table 3. Expected values for patient exposure

	Age group	<1 year		1-3 years		4-7 years		8-11 years		12-16 years	
	Exam	kV	DAP µGy×m²	kV	DAP µGy×m²	kV	DAP µGy×m²	kV	DAP µGy×m²	kV	DAP µGy×m²
Digital	Chest AP-PA	110	6,1	110	9,3	110	11,1	110	29,3	110	49,9
Screen-film	Chest AP-PA	65	3,0	73	4,0	77	4,9	90	5,4	102	8,4

Because of the great DAP value difference between the two detectors, by age groups, an additional entrance dose analysis was carried out by dividing the DAP value by the examination field size for each patient.

The difference obtained earlier for the median and mean DAP values was maintained also for the dose's median and mean values. The graphical representation is suggestive for the variation of observed values.

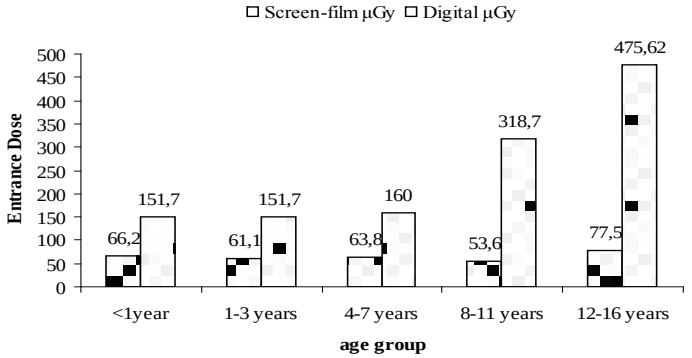

Fig.9. Entrance dose mean value. For the digital detector the increase is from 151,7 µGy to 475,6 µGy, at approximately 3 times with an exponential variation. For the screen-film detector the increase is from 66,2 µGy to 77,5 µGy, at approximately 1,2 times with a linear variation.

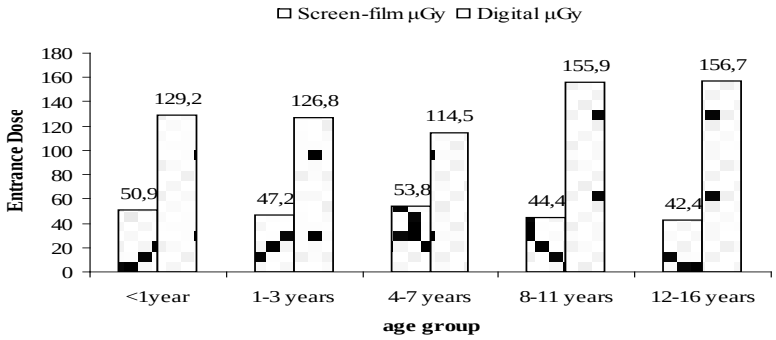

Fig.10. Entrance dose median value. For the digital detector the increase is from 129, 2 µGy to 156, 7 µGy, at approximately 1, 2 times with an exponential variation. For the screen-film detector the increase is from 53, 8 µGy to 42, 4 µGy, at approximately 1, 2 times.

DISCUSSIONS AND CONCLUSIONS

The results show a constant for the programmator of the digital detector machine for the tension applied to the tube. For the screen-film detector machine the applied tension increases proportionally with the physical development of the child considering the trunk thickness in accordance with the Table I. The obtained DAP values do not have a normal distribution regardless of the type of detector used. At the Chest AP-PA examination the lung, the heart and the ribs are contained. These examinations generate different values of mAs quantity from both of the anatomical programmators, resulting in different dose value even for the same patient. The physical development of the children does not correspond to the age standards, being usually more advanced resulting in higher dose values. For the patients having drainage tubes, electrodes, etc. the AEC gives higher exposure values. The pathological processes located near the inner curve of the kidney, the fibrous pleurisies need higher exposure values. These causes do not explain completely some high values obtained on both detectors. Following the size of the patiens' examination field shows that at the screen-film detector machine the diaphragmation is realised automaticaly based on the size of the film-containing cassette. By this way, the overdimensioning of the exposure area is eliminated. At the digital

detector machine, the size of the exposure area is chosen by the operator and in case of agitated patients can be bigger than the prescribed zone to avoid repeating the radiological examination. This is a compromise that increases the dose. Data recording is made by the machine operators. At the screen-film detector machine the radioscopic procedure is also used with the radiographic procedure for various illnesses and disorders, for searching for foreign bodies, for controling the catheter and for drainage tubes. At these patients it was registered the DAP value per examination, without separating the value for the radiographic procedure. It is necessary to develop the analysis to determine other causes of this DAP value difference. The study based only on age groups is insufficient. Weight and height must be introduced given the different physical development between patients of the same age group. The specific pathology (diastrophics, premature, metabolic and endocrine diseases, oncohaemathologic diseases, etc.) must be taken into consideration. It is necessary to verify the DQE for each of the two detectors.

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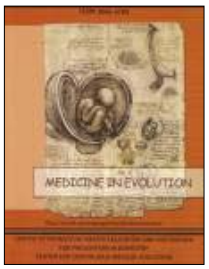
MODIFICATIONS OF THE MORPHOLOGY OF THE DENTAL – MAXILLARY APPARATUS CONSECUTIVE TO BRUXISM



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ABSTRACT

The present study is realised on 348 patients who came to the Prosthetics Clinic of the Faculty of Dental Medicine Craiova for physiognomical and morphofunctional oral rehabilitation during 2008-2009. Out of these there were selected 26 patients who had one or two signs of bruxism.

Considering the global evaluation of patients with bruxism the main factors involved in the ethyology of bruxism were highlighted: the consumption of excitants of CNS, psycho-social factors, occlusal factors and cranium traumatism in antecedents.

The most frequent manifestations of bruxism of the group of patients studied were: teeth grinding, pains at the level of temporo-mandibulary joint (TMJ), morphological disturbances of the dental arches depending on the type of dental wear which can reach different degrees up to the total destruction of the dental crowns, coronary- root fissures and fractures, fractures of the prosthetic dentures or of the placating materials, dentine hyperesthesis and muscular hypertrophy.

The treatment was achieved depending on the level of affectation of the dental tissues. This consisted either of applying some noninvasive therapies at dental level in the case of patients with incipient wear or of making up an ample prosthetical rehabilitation, associated with a general treatment according to recent ethyological hypotheses reffering to bruxism.

***Key words**: bruxism, dental wear, parafunction.*

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INTRODUCTION

Bruxism represents the most serious parafunction of the dental-maxillary apparatus which has as its consequence the pronounced wear of the dental arches, disturbances of the masticatory muscles and of the temporomandibulary joint. At the beginning of the last century, Karolyi, then Marie and Pietkiewicz[15] wrote that "the teeth grinding reunites lessions of the central nervous system as well" and introduced the term of bruxism. The term of bruxism, accepted nowadays too, was firstly used in the literature of speciality by Frohman[4] in 1931, to denote the teeth grinding and the unfunctional wear of teeth. Dawson's definition regarding bruxism has a psycho-social connotation: the teeth grinding or the teeth clenching during the night which keeps many wives awaken[3]. Kato[7] has recently proposed the following definiton for bruxism: bruxism at night represents a parasomnia and an oral parafunctional activity, characterised on one hand by the tightening of the maxillars (tonic activity) and on the other, a phasic activity of the masticatory muscles, repeated, which translates as the teeth grinding. The ethyology of bruxism constitutes the subject of endless debates. On an international level, a consesus regarding multifactors involvement[15] in the pathological mechanisms of bruxism can be noticed in the data recent published in the literature of speciality. The first opinions regarding the ethyology of bruxism dealt with the dental contacts and the pathology of muscular contractions. The ideas have evolved up to the implication of behavioral factors and especially aspects linked to sleep (Brocard, 2007)[1]. Attanasio R. (1991) and Lobbezo and co. (2006), quoted by Leonardo Lopez do Nascimento ad co. in 2008[12], show that the ethyology of night bruxism involves local, systemical, psychological and hereditary factors. The studies of speciality classify bruxism in: a. day and night bruxism; b. primary and secondary bruxism. Kato[7] mentions the differences between the primary idiopathic bruxism and the secondary bruxism of iatrogenic origin. The primary bruxism contains the effects of the psychological pressures during the day and night bruxism without any medical causes, while the secondary bruxism is part of the neurological and psychiatrical pathology, of sleeping problems or taking medicines. The importance of this ailment comes from the complexity of clinical manifestations, therapeutical difficulties and the frequent therapeutical failures. The aim of the present study is to highlight the main factors involved in the ethyology of bruxism at the analysed patients and to present the significant morphological modifycations of the dental-maxillary apparatus encountered at the same category of patients.

MATERIAL AND METHOD

The morpho-clinical research was carried out on 348 patients who came to the Prosthetics Clinics with the view of oral rehabilitation throughout the years 2008-2009. Based on the clinical and paraclinical examinations a medical working form of these patients was made up. This contains: the approval of the patients, the dental history, the highlight of the life and

working conditions, and the determination of the psychological type according to psychological form, the loco-regional clinical and paraclinical exams. The loco-regional clinical exams highlighted especially the modifycations of dental arches and intermaxillary static and dynamic relations of TMJ and of the masticatory elements.

The selection criteria of the subjects were taken from the literature of speciality. In 2005, American Academy of Sleep Medicine publish together with the European Sleep Research Society, Japonese Society Sleep Research and Latin American Sleep Society a second edition of The International Classification of Sleep Disorders, Diagnostic and Coding Manual21, which include the minimal criteria of the clinical diagnosis of the night bruxism. These are:

1. the presence of the teeth grinding and clenching during sleep and
2. the existance of at least two of the following signs : the pathological wear of teeth, sounds associated to the gnashing of teeth, the discomfort of the cheeck muscles.

Throughout the present study we included the exclusion criteria which were also taken from the literature of speciality (Lavigne and co.1996)[8] and we adapted them to the objectives of the study. The exclusion criteria were: the absence of more than two posterior teeth , excluding the third molar; the presence of serious malocclusions; taking medication with possible effects over the sleep or the motor behaviour , such as benzodiazepines, L-dopa, neuroleptics and tricyclic antidepressants; alcohol abuse and drug consume; dental treatments or general medicine in evolution; neurological or psychiatrical disturbances; sleep disorder such as the orofacial or cervical myoclonus, narcolepsy, insomnia, regular movements of the legs during sleep with an index of more tha n 2 0 events per hour of sleep. 26 patients who presented morphoclinical signs of bruxism were selected out of the 348 patients studied. The analysed parameters of the patients diagnosed with bruxism were: the distribution depending on the ethyological factors, the distribution depending on age and sex, the distribution depending on the encountered clinical manifestations. By correlating the historical data with the clinical signs we tried to render the more or less evolving character of bruxism. The data collected were statistically analysed with the programmme Microsoft Office.

RESULTS

By providing a statistical analysis of the registered data we concluded that bruxism has an incidence of 7, 4% in the case of the studied group. As far as the ethyology of bruxism is concerned the study highlighted the fact that the main ethyological factor in producing bruxism was represented by the consume of excitants: refreshments with a contents of caffeine, coffee and cigarettes. Chart number 1 states the percentage distribution of ethyological factors at the patients diagnosed with bruxism.

- the consume of excitants 96,15%;
- the contribution of psycho-social factors 73,07%
- the contribution of occlusal factors 65,38%
- a history of cranial traumatism 7,69%
- the contribution of at least 2 factors 69,23%

The distribution of the patients based on age groups showed that most of the patients diagnosed with bruxism belonged to the age group of 28-29 years old (chart. 2). The distribution of patients based on sex showed that most of the analysed patients were males (chart. 3). The main clinical manifestations highlighted at the patients with bruxism were (chart. 4):

- the teeth grinding 19 patients
- incipient dental wear 9 patients
- medium dental wear 12 patients
- advanced dental wear 5 patients
- dental fissures and fractures 17 patients
- fractures of the placating materials or of the prosthetics dentures 6 patients
- hyperesthesia 11 patients
- pains at TMJ 7 patients
- oro-facial pains 11 patients
- hypertrophy of masetar muscles 8 patients.

Chart 1. Percentage distribution of etiologic factors involved in the bruxism group of studied patients

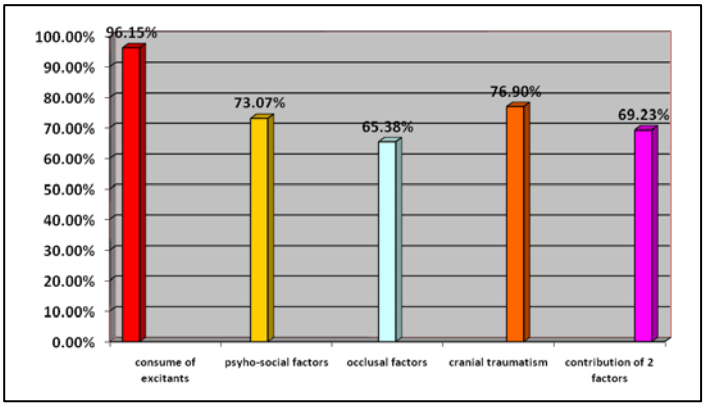


Chart 2. The distribution of patients according to age groups

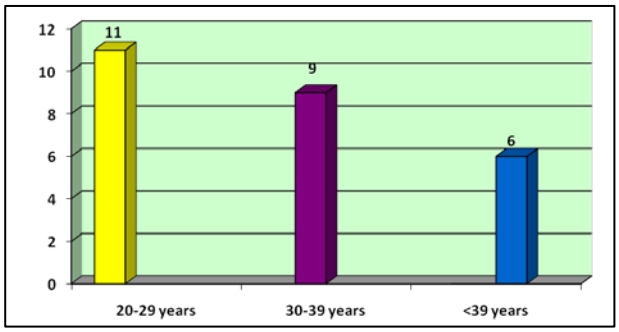


Chart 3. The distribution according to sex

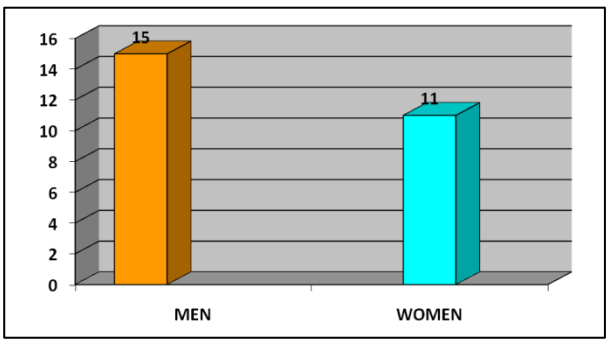
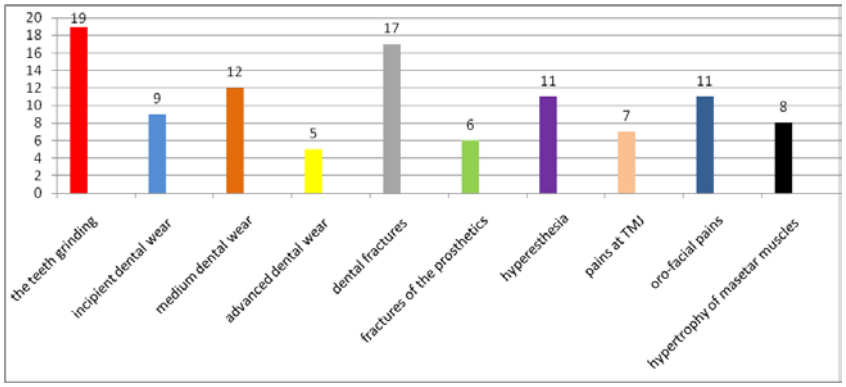


Chart 4. Buxism clinical manifestations of the group of studied patients



DISCUSSIONS

The study made highlighted a frequency of bruxism of 7,4% at the group of analysed patients. Of course the study has its limits due to the reduced number of analysed patients, but considering the plan of epidemiological prevalence, the greatest part of the authors appreciate a procentage between 6% and 20% of the adults who have suffered from buxism stages. The frequency of buxism given by Reding[16] is of 15, 1% at the patients between 13-17 years, and according to Lavigne[9] is of 8 % of the adult population. The literature of speciality cites an epidemiological study based on an interview at a number of 13057 subjects and this gives a prevelance of bruxism of 8, 2%.[13]

As far as the ethyology of bruxism is concerned the study highlighted first of all the contribution of the consume of excitants: the drinks with caffeine. Secondly there is the contribution of psycho-social factors (unemployment, working conditions that involve a high intellectual level, the insecurity of tomorrow) and thirdly there are the occlusal factors. What is important is the fact that 69, 23% of the patients presented at least two factors involved in the ethyology of bruxism. At present, the ethyology of bruxism is not fully identified. However, multifactors causes are attributed to it[10]. The periferical ethyological factors, dental occlusion and anatomic anomalies are today advanced by the psycho-social-behavioral and psycho-pathological factors. Several authors have argumented the augumentation of the level of bruxism once with the rising of the stress[18].

Rugh and Solberg pointed out the increase of the intensity of muscular contractions depending on a certain event, upon which the patient's attention is concentrated upon, bruxism being directly proportional with the stress level.[18] Slavicek speaks of bruxism as a valve of stress[19]. In the recent years, at Lavigne's insistances, the ways of research were directed to neuro-psychology to explain the mechanisms involved in the apparition and maintenance of bruxism, pointed the role of some neuromediators such as dopamine and serotonine. Recently it has been considered that dopamine does not have an important role in bruxism, because the selective inhibitories of recapturing serotonine have a direct influence upon the dopaminergical system[9]. These

products are represented by the antidepressant described currently, which can lead to bruxism if they are used for a long period of time[19]. A study realised by Kato[6], by polysomnographic recordings: electro-encephalography, electro-miography and electro-cardiography upon a group of patients with bruxism emphasised the fact that the stages of bruxism are preceded by the increase of the amplitude of alfa waves on the EEG and by the increase of the heart beat. The conclusion would be that the stages of bruxism are preceded by the increase of brain activity and of the autonomous nervous system. The hypothesis of genetical transmission of bruxism was brought forth, but they could not explain the mechanisms by which this is obtained[5]. It has also been reported manifestations of bruxism at alcoholical persons and at patients who suffered cerebral traumatisms in antecedents[11]. Some studies link bruxism to temporo-mandibulary disfunction, especially at kids[20]. A high number of researchers consider that the psycho-social factors rank on the first place in the ethyology of bruxism and the involvement of the central nervous system is certain[10]. The study pointed out that most of the patients diagnosed with bruxism were between 20-29 years old. We have also noticed that most of the diagnosed patients were males. Other studies, done by Ohayon[13] show that the prevalence of the disease is not linked to sex and increases significantly with the age, the highest prevalence being noticed at patients with ages between 19-44. As far as the clinical manifestations at the group of the patients studied we frequently encountered dental wear (70%) of various degrees and forms, depending on the lasting of the bruxism, of its more or less evolving character and the position in which the teeth clenching is done. The main types of dental wear encountered at the patients diagnosed with bruxism were: incipent dental wear (fig. 1), medium dental wear (fig. 2), and advanced dental wear (fig. 3).

Fig.1 Incipient dental wear located in the oral face of the the upper front group (Ad Palatum, described by Parma).

Fig.2 Medium dental wear with the revealing of the dentine.

Fig.3 Advanced tooth wear.

The sides of wear are present on all teeth, more or less obvious. In the case of lack of bruxism these are noticed at the level of functional teeth slopes[7]. Woda pointed the fact that dental wear is a physiological phenomenon and the presence of wear sides is not necessary linked to bruxism[22]. The presence of dental wear associates with a state of psychical tension of the patient is an important element when a differential diagnosis is made between the physiological and pathological wear. Several classifications of dental wear have been proposed, their pathological significance and the way they direct us when making up the treatment plan being important. Rozencweig's classification is orientative as far as the

diagnosis and the treatment plan are concerned[17].

- Phase I – the wear is limited by the enamail level and is present at least than three pairs of teeth.
- Phase II – the wear of enamail and the wear of dentin in the form of islands, at least than six pairs of teeth
- Phase III – the wear of enamail and the dentin without islands at over six pairs of teeth
- Phase IV – the wear excels the middle of the crown

Rozencweig states that dental wears can have various forms depending on ethyology, and names them abbrasion, erosion and attrition. The abbrasion represents the dental wear linked to mastication and is considered adaptive. The erosion is caused by chemical agressions, having concave, face to face surfaces. Attrition represents the wear of parafunctional nature that we encountered at the level of bruxism. The dental wear is the most important manifestation of bruxism, but it is not sufficient for establishing the diagnosis of bruxism. Out of the 26 patients diagnosed with bruxism we noticed the presence of dental fissures and fractures at a number of 17 patients (fig. 4), and at 6 patients we noticed fractures of placating materials of the dentures (fig. 5, 6). Other studies mention the presence of coronary-root fissures and fractures at patients with night bruxism. We encountered dentinary hyperestesia at 11 out of 26 diagnosed patients. In a study carried out in 2007 by Ommerborn and co. it is stated that the hypersensibility of teeth is more frequently encountered at patients with night bruxism than at those without bruxism[14]. As far as the presence of pain at the level of TMJ is concerned and the oro-facial pains, these were present at a number of 7, respectively 11 patients out of the 26 patients diagnosed with bruxism. A study carried out by C.M. Camparis and co.[2] in 2006 shows that there are numerical differences between the patients with facial pains and those without facial pains highlighted statistically, but the cause of these differences is not obvious. According to authors, the patients with facial pains frequently present bilateral pains at the level of the face, ears, frontotemporal region, and disfunctional occlusion, muscular pain in the morning, the sensation of muscular costriction or pression. The authors have also noticed an increase of the level of depression at the patients with pains. Taking into consideration the therapeutical difficulties and the frequent failures a stopping of the bruxism evolution is recommended for the incipient wears. In the case of medium wear a prosthetical rehabilitation can be realised only if the physionomical exigency requests it and for the advanced ones a complex prosthetical rehabilitation is requested. Unfortunately, the failures are frequent.

Fig.4 Radicular fracture accompanied by fracture of the alveolar process.

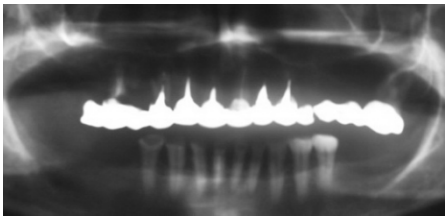


Fig.5 The fracture of a metalic skeleton from a dental bridge.

Fig.6 Cladding material fracture.

CONCLUSIONS

Bruxism represents the most serious form of parafunction of the dental-maxillary apparatus. The importance of this ailment comes from the high frequency, the polimorphism of lessions and the therapeutical difficulties.

The most frequent manifestations of bruxism are the teeth grinding, the dental wear, and disturbances of the TMJ and of the activity of the masticatory muscles.

Since the ethyopathogenical mechanisms of the producing of the disease are not clearly mentioned the treatment aims at dealing with the consequences of the disease at the level of the oral cavity.

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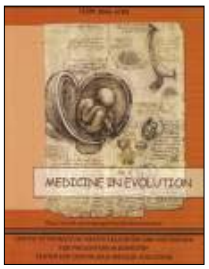
THROMBOPHILIA: THE LABORATORY ASSESSMENT AND MANAGEMENT



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ABSTRACT

Thrombophilia is an inherited or acquired predisposition to thrombosis. The ability to "explain" thrombosis has led to the increasing use of thrombophilia testing in the assessment of patients with deep-vein thrombosis (DVT) and pulmonary embolism (PE). Although such an approach to investigation satisfies the curiosity of the clinician and the patient, whether, the unselective intensive laboratory investigation of cases of venous thromboembolism (VTE) is cost-effective is open to considerable doubt. This is because of limitations in the utility of the knowledge gained in determining evidence-based treatment protocols for individual patients and because the interpretation of some tests for heritable thrombophilia is problematic.

We presented the clinical manifestation of thrombophilia, the laboratory assessment and management. We tried to establish who should be tested, what tests should be requested, when should testing be performed, and how should the test results affect primary prevention, acute therapy, and secondary prophylaxis of thrombosis.

***Key words**: Thrombophilia, pulmonary embolism, laboratory assessment.*

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INTRODUCTION

Symptomatic thrombosis is a multifactor disease that manifests when a person with an underlying predisposition to thrombosis (i.e., thrombophilia) is exposed to clinical risk factors. It may be associated with a disease (e.g., oral contraceptives) or condition (e.g., pregnancy or postpartum; "acquired thrombophilia" Table 1), or thrombophilia may be inherited (Table 2). Thrombophilia must be considered in the context of other risk factors for incident thrombosis, or predictors of recurrent thrombosis, when estimating the need for primary or secondary prophylaxis.

Table 1

Acquired or secondary thrombophilia[1]	
Strongly Supportive Data	Supportive Data
Active cancer Chemotherpay (L-asparaginase, Thalidomide, anti-angiogenesis therapy) Myeloproliferative disorders Heparin-induced thrombocytopenia Nephrotic syndrome Disseminated intravascular coagulation Thrombotic thrombocytopenic purpura Sickle cell disease Oral contraceptives Estrogen therapy Pregnancy/postpartum state Selective estrogen receptor modulator therapy (tamoxifen and raloxifene) Antiphospholipid antibodies Paroxysmal nocturnal hemoglobinuria Wegener granulomatosis	Inflammatory bowel disease Thromboangiitis obliterans (Buerger disease) Behçet syndrome Varicose veins Systemic lupus erythematosus Venous vascular anormalities (e.g., Klippel Trenaunay syndrome) Progesterone therapy Infertility "therapy" Hyperhomocysteinemia HIV infection Dehydration

Table 2

Hereditary (familial or primary) thrombophilia[1]		
Strongly Supportive Data	Supportive Data	Weakly Supportive Data
Antithrombin deficiency Protein C deficiency Protein S deficiency Activated protein C resistance Factor V Leiden Prothrombin G20210A Homocystinuria	Increased plasma factors I (fibrinogen), II (prothrombin), VIII, IX, XI Factor XIII polymorphisms Hyperhomocysteinemia Dysfibrinogenemia Reduced tissue factor pathway inhibitor	Estrogen therapy Reduced protein Z and Z-dependent protease inhibitor Tissue plasminogen activator deficiency Increased plasminogen activator inhibitor (PAI)-1 Increased thrombin-activatable fibrinolysis inhibitor Hypoplasminogenemia and dysplasminogenemia Hypofibrinolysis

Thrombophilia may present clinically a s one or more of several thrombotic manifestations (phenoltypes, Table 3).

The predominant clinical manifesttation of thrombophilia is VTE. There is no single laboratory assay that will identify all thrombophilias and an expensive assay is usually required. These laboratory analyses are affected by other conditions (e.e, warfarin reduces protein C (PC) and protein S (PS) levels). There are several questions that all clinicians must answer when faced with evaluating a patient for a possible thrombophilia. [1]

The clinical management of VTE includes: treatment of the acute episode with heparin, a variable duration of controlled-intensity anticoagulant prophylaxis with coumadin, attention to avoidance of contributory factors and

use of thromboprophylaxis at times of increased risk of thrombosis.

Identification of a particular genetic predisposition should rarely influence management. [1,4]

Table 3

Trombophilia: clinical manifestations
Purpura fulminans (neonatalis or adult) Superficial or deep vein thrombosis, pulmonary embolism Thrombosis of "unusual" venous circulations (e.g., cerebral, hepatic, mesenteric, and renal veins; not retinal vein or artery) Warfarin-induced skin necrosis Possibly arterial thrombosis (e.g., stroke, acute myocardial infarction) Recurrent fetal loss Possibly complications of pregnancy (e.g., intrauterine growth restriction, stillbirth, severe pre-eclampsia, abruption placentae)

Table 4

Independent risk factors for deep vein thrombosis or pulmonary embolism		
Baseline characteristics	Odds ratio	95% CI
Hospitalization for acute medical illness	7.98	4.49, 14.18
Hospitalization for major surgery	21.72	9.44, 49.93
Trauma	12.69	4.06, 39.66
Active cancer without chemotherapy	4.05	1.93, 8.52
Active cancer with chemotherapy	6.53	2.11, 20.23
Prior central venous catheter or transvenous pacemaker	5.55	1.57, 19.58
Prior superficial vein thrombosis	4.32	1.76, 10.61
Neurologic disease with extremity paresis	3.04	1.25, 7.38
Serious liver disease	0.10	0.01, 0.71

Table 5

Independent predictors of VTE recurrence[24]		
Characteristics	Hazard ratio	95% CI
Age	1.17	1.11, 1.24
Body mass index	1.24	1.04, 1.47
Neurologic disease with extremity paresis	1.87	1.28, 2.73
Active cancer without chemotherapy	4.24	2.58, 6.95
Active cancer with chemotherapy	2.21	1.60, 3.06
per decade increase in age		
per 10 kg/m^2 increase in body mass index		

Indications for thrombophilia testing: Why should be tested for thrombophilia?

There are no absolute indications for clinical diagnostic thrombophilia testing. Relative indica-tions could include: selected screening of populations that are potentially "enriched" for thrombophilia (e.g., asymptomatic or symptomatic family members of patients with a known familial thrombophilia, first-degree relatives) or populations at increased risk for thrombosis (e.g., prior to pregnancy, oral contraceptives or estrogen therapy10, high-risk surgery, or chemotherapy with angiogenesis inhibitors), and testing symptomatic patients with incident or recurrent thrombosis. [1,3]

Screening Asymptomatic Family Members

Thrombophilia testing should only be done if the results are likely to change medical management. The risk of idiopathic ("unprovoked") thrombosis associated with a thrombophilia is still insufficient to warrant chronic primary prophylaxis (e.g., warfarin anticoagulation). [1,16] When estimating the absolute risk of thrombosis, it is important to include the effect of age on the baseline incidence.[2]

Primary prevention of incident VTE

The survival after VTE is significantly less than expected, especially after PE. Pulmonary embolism accounts for an increasing proportion of VTE with increasing age for both sexes. Primary prevention of VTE, either by risk-factor modification or by appropriate prophylaxis of patients at risk, is important because it improves survival and prevents complications. [9] To avoid or modify risk, or appropriately target prophylaxis, patients at risk for VTE must first be identified. Independent risk factors for VTE, and the magnitude of risk associated with each, are shown in Table 4. Among women, additional risk factors for VTE include oral contraceptive use and hormone modulators[10], pregnancy and the postpartum period. Inherited reductions in plasma natural anticoagulants (e.g., antithrombin III, PC, or PS) have been recognized as uncommon but potent risk factors for VTE. Other additional reduced natural anticoagulants or anticoagulant cofactors, impaired downregulation of the procoagulant system (e.g., activated PC resistance, factor V Leiden[19,20]), increased plasma concentrations of procoagulant factors (F) (e.g., F I (fibrinogen), II (prothrombin), VIII, IX, and XI) and increased basal procoagulant activity, impaired fibrinolysis, and increased basal innae immunity activity and reactivity have added new factors to the list of inherited or acquired disorders predisposing to thrombosis. Inherited thrombophilia interact with clinical risk factors (i.e., environmental exposures) as oral contraceptives, pregnancy, hormone therapy, surgery and cancer[15] to increase the risk of incident VTE. Is important to consider thrombophilia testing for asymptomatic men and women family members with a known family history of familial thrombophilia.[1]

Secondary prevention of recurrent VTE

VTE recurs frequently; about 30% of patients develop recurrence within the next 10 years. The hazard of recurrence varies with the time since the incident event and is highest within the first 6 to 12 months. Independent predictors of recurrence and the hazard of recurrence associated with each are shown in Table 5. Other predictors of recurrence include "idiopathic" VTE, a persistent lupus anticoagulant[13,22] and /or persistent hightiter antiphospholipid, antibody, antithrombin, PC or PS deficiency, combined heterozygous carriers for more than one familial thrombophilia (e.g., heterozygous for the F V Leiden and prothrombin G20210A mutations) or homozygous carriers, and possibly increased procoagulant F VIII and F IX levels, decreased tissue-factor pathway inhibitor levels and persistent residual deep vein thrombosis.[1] An increased D-dimer measured at least one month after stopping warfarin therapy may be a predictor of recurrence independent of residual venous obstruction.[4,14] Secondary prophylaxis with anticoagulation therapy should be considered for patients with these characteristics. The secondary prophylaxis should be important for incident PE, especially for patients with chronic heart or lung disease and reduced cardio-pulmonary functional reserve.[1,8,17]

Diagnostic thrombophilia testing: who should be tested?

Currently recommended indications for thrombophilia testing include idiopathic or recurrent VTE; a first episode of VTE at a "young" age (e.g., < 40 years); a family history of VTE (in particularly, a first-degree relative with thrombosis at a young age); venous thrombosis in an unusual vascular te-

rritory (e.g., cerebral, hepatic, mesenteric, or renal vein thrombosis); and neonatal purpura fulminans or warfarin-induced skin necrosis[1,23,14]. A "complete" laboratory investtigation is recommended for patients who meet these criteria.

Diagnostic thrombophilia testing

A complete history and physical examination is mandatory when evaluating individuals with a recent or remote history of thrombosis with special attention given to patient age at onset, location of prior thrombosis, and results of objective diagnostic studies documenting thrombotic episodes. Patients should be questioned about diseases, exposures and conditions or drugs that are associated with thrombosis[15]. Potential assays for general diagnostic testing and recommendded assays for initial and selected additional special coagulation testing for a familial or acquired thrombophilia are presented in Table 6. All abnormal test results are confirmed by repeat testing after correction of any acquired causes for an abnormal result.

Table 6

Laboratory evaluation for suspected familial or acquired thrombophilia[1]
Initial General Diagnostic and Special Coagulation Laboratory Testing
CBC with peripheral smear Prothrombin time Activated partial thromboplastin time Thrombin time and reptilase time Lupus anticoagulant panel Anticardiolipin and anti-β2-glycoprotein1 antibodies Activated protein P (APC) - resistance Fibrinogen, soluble fibrin monomer complex and quantitative plasma fibrin D-dimer Prothrombin G20210A mutation genotyping Plasma homocysteine
Additional selective special coagulation laboratory testing
F V Leiden mutation genotyping For patients with idiopathic or recurrent VTE; a first episode of VTE at a "young" age; a family history of VTE; venous thrombosis in an unusual vascular territory; neonatal purpura fulminans or warfarin-induced skin necrosis: - antithrombin activity (followed by antithrombin antigen level if the activity is low) - PC activity (followed by PC antigen level if the activity is low) - PS activity (followed by free-PS antigen level if the activity is low) Flow cytometry for paroxysmal nocturnal hemoglobinuria Plasma ADAMTS-13 activity (for acquired or familial thrombotic thrombocytopenic purpura) Plasminogen activity Heparin-induced thrombocytopenia testing Quantitative PCR assay for JAK2 mutation.
Additional selective general diagnostic testing
ESR, chemistries, PSA, β-HCG, Ca-125, ANA, (dsDNA, RF, ENA) PA/lateral CXR, urinalysis, mammogram Colon imaging Chest imaging for smokers (CT, MRI) ENT consultation, especially for smokers UGI/ upper endoscopy Abdominal imaging (CT) Endometrial biopsy if endometrial cancer suspected Angiography

Timing of diagnostic thrombophilia testing

As acute phase reactance, plasma levels of antithrombin and occasionally PC and PS may transiently decrease, and fibrinogen and F VIII levels may increase, with acute thrombosis. Thrombophilia testing should be delayed for at least 6 weeks to allow acute-phase reactant proteins to return to baseline. Heparin therapy can lower antithrombin levels and impair interpretation of clot-based assays for a

lupus anticoagulant. Warfarin therapy reduces vitamin K-dependent factors including PC and PS. Many authorities recommend delaying testing until the effects of heparin and warfarin therapy have resolved. In those for whom temporary discontinuation of anticoagulation is not practical, heparin can be substituted for warfarin when testing PC and PS levels. DNA testing for the F V Leiden and prothrombin G20210A mutations, is unaffected by anticoagulation therapy.[2,9]

Knowledge of the main risk factors is essential for the diagnosis and the correct prevention of VTE. As to the diagnosis of VTE, the investigations performed may be negative in about 70%–75% of outpatients with signs and symptoms of acute DVT (deep venous thromboembolism); conversely, at least between 30% and 50% of cases of DVT are asymptomatic, the percentage being much higher in the hospital setting, and very high in patients undergoing surgery (90%–95% of post-operative DVT cases are asymptomatic). Physicians should be aware that the knowledge of the main risk factors and an appropriate diagnostic work-up is essential to establish the presence of DVT in patients presenting with suggestive symptoms, so that prophylactic anticoagulant treatment can be instituted.[1,10,14]

Diagnostic thrombophilia testing: The management of patients with thrombophilia

Primary prophylaxis

All patients should receive antithrombotic prophylaxis when exposed to risk factors. Thrombophilia screening in the absence of a known family history of familial thrombophilia is not recommended.

Current recommendations regarding VTE prophylaxis for surgery of hospitalization for medical illness are based on clinical characteristics; prophylaxis regimens are not altered based on a known inherited or acquired thrombophilia. The increased risk of symptomatic VTE after high-risk surgery, patients with a known thrombophilia should be considered for a longer duration of prophylaxis.[1,2]

Acute therapy. Patients with a familial or acquired thrombophilia and acute VTE should be with intravenous unfractionated heparin, low –molecular - weight heparin or fondaparinux. Some patients with antithrombin deficiency may be relatively heparin resistant. Antithrombin concentrate can be used in special circumstances: recurrent thrombosis despite adequate anticoagulation, unusually severe thrombosis or difficulty achieving adequate anticoagulation, before major surgery or in obstetric situations when the risks of bleeding from anticoagulation are unacceptable. Hereditary PC deficiency can be associated with warfarin-induced skin necrosis. Warfarin should be started after therapeutic heparinization, and the initial warfarin dose should be low (e.g., 2 mg) and increased slowly. Individuals with a history of warfarin-induced skin necrosis can be anticoagulated after receiving a source of exogenous PC (e.g., fresh frozen plasma, investigational PC concentrate).[1] Acute therapy aims to prevent extension or embolism of an acute thrombosis and needs to continue for a sufficient duration of time and intensity to ensure that the acute thrombus has either lysed or become organized, and the "activated" acute inflammatory / innate immunity system has returned to baseline.[1,13]

Secondary prophylaxis

It is important to make a distinction between acute therapy and seconddary prophylaxis. Beyond 3 mon-

ths, the aim of continued anticoagulation is to prevent recurrent thrombosis. The decision for secondary prophylaxis depends on estimates of the risk and consequences of unprovoked VTE recurrence while not receiving secondary prophylaxis, the risk of anticoagulant-related bleeding, and patient preference. Secondary prophylaxis is not recommended after a first-lifetime venous thrombosis, especially if the event was associated with a transient clinical risk factor.[13,14] Secondary prophylaxis may be used for idiopathic, recurrent, or life-threatening VTE (e.g., PE, especially in association with persistently reduced cardiopulmonary functional reserve; phlegmmasia with threatened venous gangrene; or purpura fulminans), persistent clinical risk factors (e.g., active cancer, chronic neurologic disease with extremity paresis, or other persistent secondary causes of thrombophilia (Table 1). We can do secondary prophylaxis for a persistent lupus anticoagulant, high-titer anticardiolipin or anti-β2-glycoprotein-1 antibody, antithrombin, PC or PS deficiency, increased basal F VIII activity, hyperhomocysteinemia, combined heterozygous carriers for more than one familial thrombophilia or homozygous carriers, and increased plasma fibrin D-dimer. For among patients with active cancer, low-molecular-weight is recommended as long as the cancer remains active. The risk of recurrent VTE must be weighed against the risks of anticoagulant-related bleeding. Additional risk factors for bleeding include prior gastrointestinal bleeding or stroke, or one or more comorbid conditions, including recent myocardial infarct, anemia (hematocrit < 30%), impaired renal function (serum creatinine> 1, 5 mg/dL), impaired liver function, and thrombocytopenia. The patient's prior coagulation experience during acute therapy should also be considered; patients with unexplained wide variation in the international normalized ratio (INR), or noncompliant patients likely should not receive secondary prophylaxis. It is inappropriate to recommend "lifelong" or "indefinite" anticoagulation therapy. Adequate prophylactic anticoagulation during risk situations for all patients with a history of a thrombotic event may be the most important measure to reduce the risk of a recurrent event. Women using oral contraceptives should be advised to refrain from further use. The decision on optimal duration of anticoagulation therapy after a first thrombotic event will probably need to be based on clinical factors (male sex, oral contraceptive use, and idiopathic first thrombotic event) rather than laboratory abnormalities.

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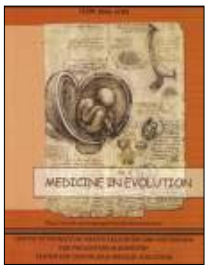
THE INCIDENCE OF COMPLETE DENTURE REPLACEMENT IN A PRIVATE DENTAL PRACTICE IN TIMIŞOARA



LORETA SZABO[1]

1. **"SALdent-Dr. Szabo Dental Medical Practice" Timişoara**

ABSTRACT

Introduction: *The incidence of complete denture prosthetic reconstructions has been analyzed on a lot of patients treated in "SALdent-Dr. Szabo Dental Medical Practice" dental medical practice in Timişoara between 2000 and 2010.*

The objective was to evaluate the frequency of compete dentures placement according to: age groups, gender, social background and according to specific materials and technologies that were used.

Material and method: *The activity of the dental practice between 2000 and 2010 was analyzed considering patients' age groups, gender and social background, materials and technologies (heat-curing polymers, casting) used for fabrication of complete dentures. The materials that were used were heat-cured: Superacryl Plus, Royaldent Plus, Triplex, Meliodent® Heat Cure and casting: Vertex™ Castapress.*

Results: *It was found that, on average, approximately 90 cases are successfully treated every year. A significant growth was recorded between 2008 and 2009 when 122 cases were registered. Out of a total of 921 successfully treated cases between 2000 and 2010, most of the patients (310 cases) are aged 50-59. Gender distribution shows that women are twice as affected as men, and addressability of patients coming from urban areas exceeds the one in the rural areas with 57.4%. Heat - cured resins for complete denture fabrication was preferred, as well as cast resin technology. Among the materials used since 2003, Meliodent® Heat Cure was preferred, due to its highly aesthetic qualities.*

Conclusion: *The statistical evaluation is useful for assessing the trends in the evolution of denture fabrication materials and technologies, for the efficiency of the dental practice activity and for an awareness regarding trends in dental prosthetics.*

Key words: *complete dentures, technology, acrylic resins.*

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INTRODUCTION

Total edentation has always risen, and still raises one of the most difficult problems in dental medicine. Any prosthetic reconstruction of this type must aim at restoring dental arcades, at recovering mastication, phonetic, aesthetic functions and give back self-esteem to the patient. Complete dentures represent the largest prosthetic piece inserted in the oral cavity and is perceived as a shock by most of the patients, determining them to question their ability of getting accustomed to this type of prosthesis, the acceptance being thus quite difficult.

Patients – accommodation problems, association with old age

Failure – immediately noticeable in the dental practice.

During all these years, the materials used in the treatment of total edentation, as well as the technologies used for the fabrication of dentures have diversified at a large scale. At present, new materials and technologies have enabled the production of dental prostheses with advanced mechanical and biological features. Acrylic resins are known since 1900. After almost twenty years, due to research and development in the field of chemistry, methacrylate has become a pillar in the technology of dental prosthesis. The industrial production of MMA began in 1934. Thus, the technology of complete dentures was marked by important changes in the 40's. According to the classification of resins in DIN EN ISO-1567, there are several categories of polymers accepted for use in the technology of complete dentures: heat-cured resins (>65°C); self-cured resins (<65°C), thermoplastic resins; light-polymerization resins; microwave polymerization resins. Together with the development and the increase in diversity of materials and production technologies for dental prosthesis, the quality of heat-cured resins has changed and improved. They became more resistant and aesthetical (by increasing the variety of colors, adding "small veins"-pink-shade fibers). They have high mechanical and dynamic features, which improve denture adaptation in the patient's mouth; they are biocompatible, less toxic and hypoallergenic. Moreover, they prove to have excellent color stability.

MATERIAL AND METHOD

We carried out a study having as objective the statistical analysis of total edentation cases successfully treated by complete dentures in the SALdent Dr.Szabo dental practice in Timişoara during the period between 2000 and 2010. We assessed the incidence of the need for complete denture treatment according to age, gender, and social back-ground parameters, as well as aesthe-tics, chromatic stability in time, mecha-nical and resistance features, repairs, biocompatibility. For the fabrication of dentures bases we used Superacryl Plus (SpofaDental a.s. Markova, Czech Rep.), Royaldent Plus (Palatinal Fogyarto Kft. Gyongyos, Hungary), Triplex (Ivoclar Vivadent AG Schaan, Liechtenstein), Vertex™ Castapress (Vertex-Dental B.V. Zeist, the Netherlands) and Meliodent® Heat Cure (Heraeus Kulzer GmbH Hanau, Germany).

The technologies of denture fabrication followed the producer's instructions.

RESULTS

The incidence of prosthetic treatment (table 1) with complete dentures, according to age groups and gender was: 33.66% for the 50-59 years age group and 61.2% for women, while for men the incidence was 38.8% (Chart I), the highest number of patients in an age group being found in the case of women aged 50-59 and men between 60 and 69 years old. (Chart II).

Table 1. The incidence of prosthetic treatment

Age group (years)	Gender		Total patients
	Men	Women	
< 40	5	2	7
40 - 49	67	57	124
50 - 59	67	243	310
60 - 69	108	108	216
70 - 79	91	133	224
> 80	19	21	40
Total	**357**	**564**	**921**

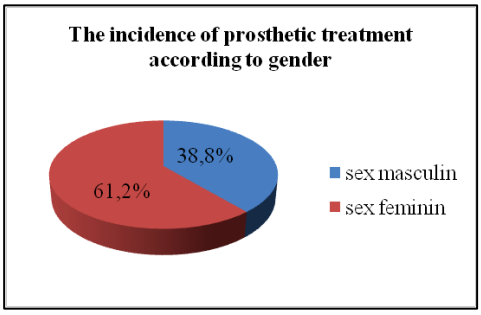

Chart 1. The incidence of prosthetic treatment according to gender

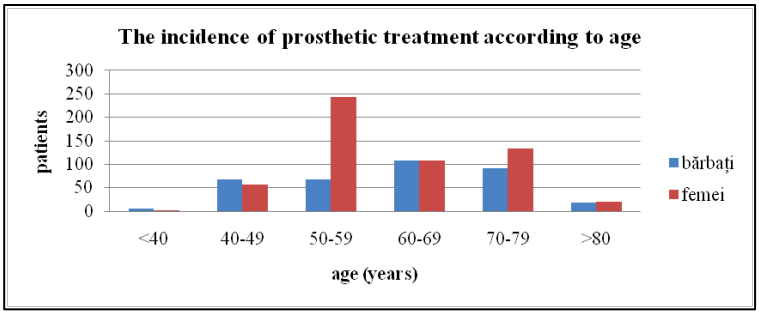

Chart 2. The incidence of prosthetic treatment according to age

In the case of women, the highest frequency of complete dentures was determined for the 50-59 years age group with a percentage of 43.09% (Chart III), while 30.25% of the men needing prosthetic treatment belonged to the 60-69 years age group. (Chart IV)

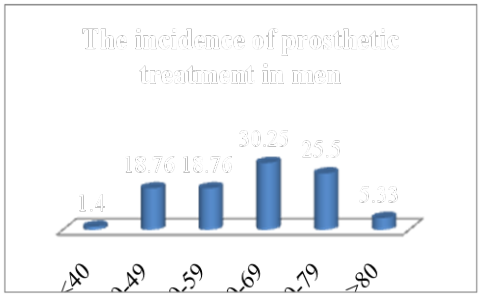

Chart 3. The incidence of prosthetic treatment in men

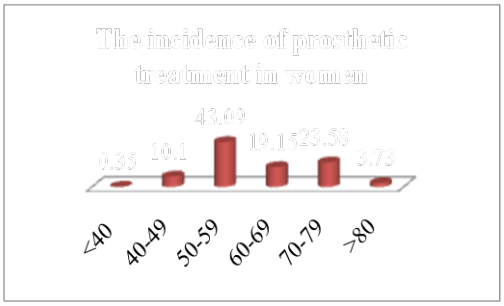

Chart 4. The incidence of prosthetic treatment in women

It is worth mentioning that the highest percentage of patients treated with complete dentures came from urban areas – 78. 7%, while only 21. 3% came from the rural areas. (Chart V).

The distribution of patients treated with complete dentures according to the year of production (Chart VI) is the following: out of the total of 921 dentures produced in the period of time between 2000-2010: 78 were produced between 2000-2001; 94 between 2001-2002; 85 between 2002-2003; 65 between 2003-2004; 90 between 2004-2005; 94 between 2005-2006; 83 between 2006-2007;14 between 2007-2008; 22 between 2008-2009; 96 between 2009-2010.

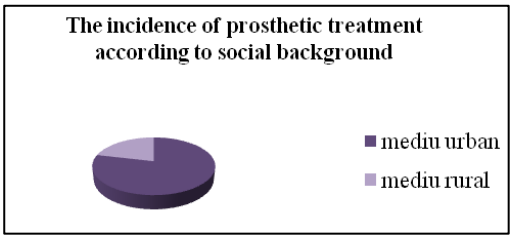

Chart 5. The incidence of prosthetic treatment according to social background

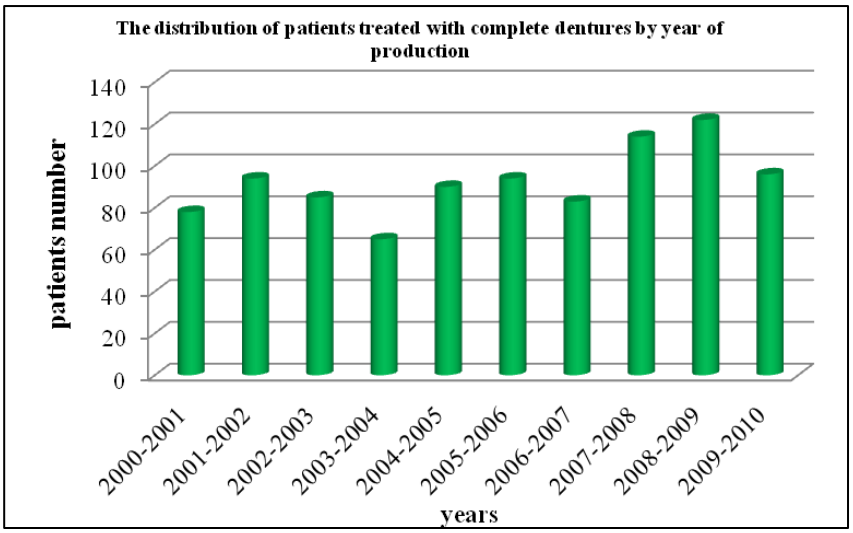

Chart 6. The distribution of patients treated with complete dentures according to years of production

We can observe that most of the dentures have been carried out in the last years, especially in the period 2008-2009, with a frequency of 13.25% of the cases.

In this time interval, dentures were produced from various types of acrylic resins (Table 2), the most widespread being Meliodent® (Heat Cure of the producer Heraeus Kulzer GmbH Hanau, Germany).

It can be noticed that, while in the beginning of the period dentures were produced from Superacryl Plus and Royaldent Plus, in the last years, due to the higher aesthetic requirements, the use of new resins like Meliodent and Vertex was imposed. (Chart VII)

Table 2. Acrylic resins used between 2000 and 2010

Type of acrylic resin	Complete dentures produced
Superacryl	44
Royaldent Plus	217
Triplex	24
Meliodent	523
Vertex	113

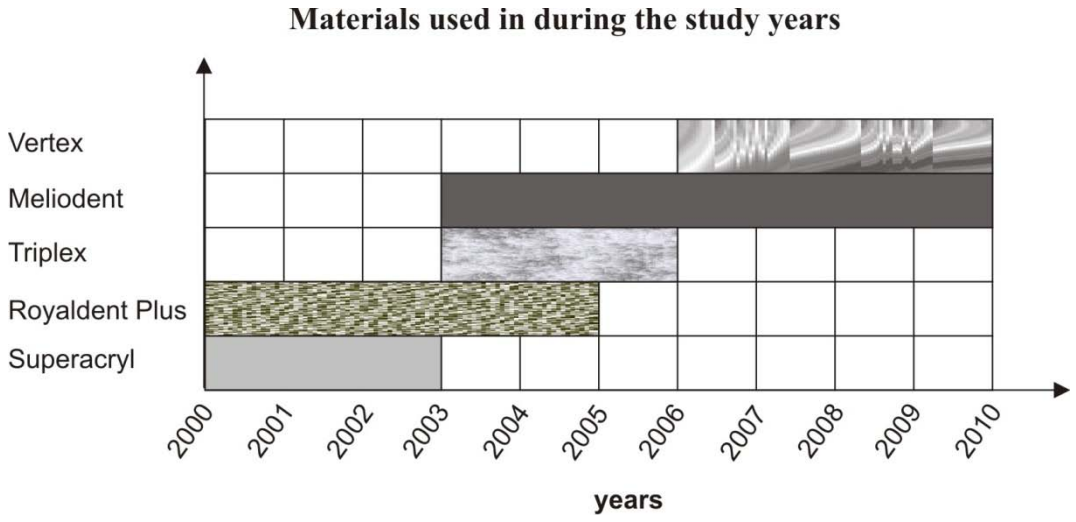

Chart 7. Materials used during the study

Moreover, out of the total of produced dentures (table 3) 258 de repairs, representing a percentage of 28.01% and 426 de coatings, a percentage of 46.25%, respectively, were needed.

Table 3. The incidence of denture repairs and coatings

Produced dentures	Repairs	Coatings
921	258	426

It is worth mentioning that as few as 188 dentures were replaced with new ones.

DISCUSSIONS

During the studied time interval we noticed that the incidence of prosthetic treatment with complete dentures is of approximately 90 yearly cases, with a significant growth up to 122 cases between 2008 and 2009. Values of 63.5 total edentulous patients during 2000-2008 and an average of 98 between 2005 – 2008 have been mentioned by Despa E.-G. in a study published in The Romanian Dentistry Review (2008).[4]

As far as the difference between the two genders is concerned, it is obvious that women are more concerned by aspect and physiognomy than men. The higher frequency of total edentation in women than in men was highlighted by Hutu (1998) and later by Bratu (2005).[1,5]

Statistics show that half of the individuals aged over 55 have at least one partial denture.[6]

According to social background, the scale turns in favor of the patients coming from urban areas. This is also due to the fact that addressability of the patients in urban areas (access, financial status) is higher than the one for rural area patients. In 2010, the number of patients treated with complete dentures is decreasing, most likely due to the living standard decrease, in Romania as well as worldwide, although the health insurance services partly support the costs. Moreover, Despa (2008) underlines the fact that patients with a high social status have shown a remarkable interest in prosthetic treatments and in maintaining the health of the dento-maxillary apparatus, with a higher frequency for the 66-70 age groups, as compared to the under-privileged category.[4]

Superacryl Plus (SpofaDental, Markova, Czech Republic) was used in the beginning of the study period, but it was abandoned because of the unsatisfactory color variety. This acrylic resin had good mechanical features, but, none the less, once it was possible to purchase new materials, the transition to advanced technologies was made.

Between 2000 and 2005 complete dentures were also fabricated using Royaldent Plus (Palatinal Fogyarto Kft. Gyongyos, Hungary), a resin with good mechanical stretching features. These prosthetic reconstructions proved to have many faults at larger widths, which lead to their rapid replacement.

During the last period, the most important issue to be solved is the one of aesthetic requirements. Consequently, new dental materials were imposed. Reconstructions that better mask the absence of dento-periodontal units become more modern, i.e. the emergence of acrylic resins with pink-shade fibers and a more diversified range of colors. In this category Meliodent® (Heat Cure of the producer Heraeus Kulzer GmbH Hanau, Germany) seems to be the favorite of dental technicians in Timişoara after 2003. This is due to the fact that the resin has transparency, suitable color and meets the aesthetic requirements patients are more and more interested in. The majority of denture users do not want to disclose the fact that they are treated with this kind of prosthetic reconstructions. In this period, complete dentures have mostly been fabricated from this material. Dental prostheses fabricated from this heat-curing acrylic resin not only prove to be highly aesthetical and stable in time, but also benefit from a suitable color variety and good mechanical features. As for the disadvantages of the material,

however, we can mention that it is brittle and rigid in processing.

Other aesthetic issues come from the attempts to maintain and imitate the patient's physiognomy in the dentition period, especially for the frontal area. Some of the issues derive from the pre-extraction assessment of teeth positioning on arcades, which must be perfectly reproduced in the dentures. In addition to the choice of the acrylic resin for fabricating the denture basis (transparency, chromatics, small veins) in order to obtain a high aesthetic impact, the choice of artificial teeth is highly important. A diversification has also occurred in this field, i.e. new sets of teeth have been produced, which successfully imitate various shapes, colors and shades of natural teeth. From the patients' point of view, the requirements have visibly emerged towards very light colors and small sizes, although these are not always the most suitable. The most preferred color is A2 (Vita key).

Others appreciate very much the occlusion aspect, which can trigger aesthetic failures (frontal and lateral inverse occlusion and mastication dysfunction, as a result of the erroneous positioning of artificial teeth; cusps contact means the interposition of the cheeks or the tongue at dental contacts and generates solutions of continuity).

In the last years, raising the efficiency of technologies in the dental laboratory is aimed at by shortening the fabrication time, eliminating intermediate work phases, which consume materials that are not found in the end product – the complete denture. As a result, new technologies have emerged: injection, casting, light curing, and use of microwaves.

Dental practices are striving to introduce new, more efficient technologies. In the same way, our dental practice has also introduced one new technology (regretfully only one): in the last period of the study, dentures were fabricated from Vertex. The other technologies could not be applied because the investments in the necessary equipments for fabricating complete dentures according to modern technologies are significant and dental laboratories in Timişoara are not industrial, but small units, with few technicians. In addition, we must keep in mind the recession period we are going through.

CONCLUSIONS

In the time interval between 2000 and 2010, the fabrication of complete dentures in "SALdent-Dental medical practice Dr.Szabo" in Timişoara counted an annual average of 90 cases.

Most of the patients belong to the 50-59 years age group, with a preponderance of women and a predominance of the urban area population.

More than half of the dental prostheses fabricated in the dental practice were made of Meliodent® HeatCure (Heraeus Kulzer GmbH Hanau, Germany) due to the highly aesthetic features of this acrylic resin, its mechanical features and its remarkable biocompatibility.

Statistical evaluation is useful in assessing trends of materials and fabrication technologies for dentures, for our dental practice as well as in general.

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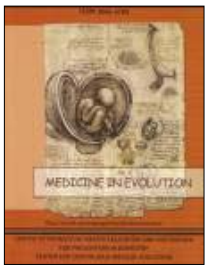
OBESITY AND SLEEP APNEA



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ABSTRACT

The obstructive sleep apnea has been associated with an increased incidence of hypertension, CVA and cardiovascular disease [1].

The metabolic syndrome is recognized as an association of obesity, glucose-intolerance, dislipidaemia and hypertension.

In the last 70 years a substantial increase of metabolic syndrome prevalence is noticed, increase that that coincides with hightened prevalence of obesity.

The essential significance of this metabolic syndrome is that the association of these risk factors predisposes the patients to an early onset of cardiovascular disease [2].

***Key words**: sleep apnea, obesity, metabolic syndrome.*

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INTRODUCTION

Although there are variations in defining metabolic syndrome according to different studies, they all include the existance of several combination of obesity, hyperglicemia, dyslipidaemia (elevated triglicerides or lowered HDL cholesterole), and hypertension to any particular patient. The prevalence of metabolic syndrome is about 22, 8% among adult males and 22, 6% in adult females in USA [3]. In the last 2 decades there has been an obvious increase of different types of metabolic disfunctions in patients with OSAS, and the assiciation of OSAS and MS has been described as „syndrome Z" at the end of the 90 s[4]. However there is little mentioned in the literature regarding MS the subject of sleep apnea. There are incresead amount of evidence, both clinical and experimental, that demonstrates OSAS's contribution in developing and/or agravating preexisting metabolic diseases and the syndromal entity.

On the other hand, the MS and its components, esspecially obesity and diabetes/insulinresistance, might influence the onset of sleep apnea. There have also been hypothesis that have been stipulating that OSAS should be defined as a metabolic disorder as well as a component of MS.

The obesity is a common pathology in the modern society. In 2005, amongst the adult population of USA, 60, 5% presented excess overweight, 23, 9% were obese and 3% had morbid obesity.

The obesity has been proven to be the main precursor of MS, and is also a significant clinical factor in the onset of obstructive sleep apnea, although it is just one of many risk factors. Because the obstructive sleep apnea and MS are associated with obesity and a higher risk of cardiovascular disease, the latest studies are indicating that there might be an association between obstructive sleep apnea and MS 5.

The obesity is the most significant predisposing factor for OSAS. An 6 kg/m2 increase of BMI can lead to a four time higher risk of developing OSAS 6. Central obesity, characterized by abdominal, upper head and neck fat disposition, is more frequently associated with OSAS [6,7]. Obese patients with OSAS have up to 42% more fat in the upper body region compared to healthy individuals, thus causing the narrowing of the laringeal tract and subsequently the increased risk of developing OSAS[8]. A recent study has shown that losing weight can determine an increase of the diameter of upper respiratory airways, with a positive outcome on AIH. The obese females are less susceptibile to OSAS that men, because the fatty tissue is thinner in the upper body area, but once the menopause is installed, the fatty tissue beggins redestributing, therefore determining the increase of risk to develope OSAS. Another probable mechanism associated with OSAS obesity involves the hormone produced by the fatty tissue. Leptine is such a hormone, produced by the fatty tissue, that plays an essential part in regulating the body weight [9, 10]. The level of this hormone is correlated with the BMI and insuline levels, and its production is modulated by stress and citokines. The studies on animal and human models have shown that different tipes of visceral fatty tissue cells (simple fat cells, stromal cells, macrophages and vascular cells) are secreting a number of citokines as: adiponectin, rezistin, angiotensin, alfaTNF factor and interleukin, that are all contributing to the development of

insulinresistance and the proinflamatory condition that occurs in abdominal obesity [11, 12]. As well as controlling the body weight, leptine also has an effect on the central respiratory center, hipoventilation and hypercapnia beeing noted in mice with leptine defficit. The administration of leptine corrects these flaws, regardless of the BMI. The increase of leptine level can play a vital role in the sleep pathology [13].

OSAS patients show higher leptin levels when compared with control individuals with the same body weight, and treatment of OSAS reduces the levels of that hormone [14]. Some authors also suggest that SASO may also play a role in body-weight gain because of hyperleptinemia, insulin resistance and inflammatory activity [13], and, as in a vicious cycle, worsens the problem even further. On the other hand, neuropeptide Y, a hypothalamic orexigenic peptide, can be also higher in patients with OSAS, regardless of the obesity level, unlike leptine 15. However, the clinical significance of this fact is yet to be determined. Controversies are also noted regarding the connection of plasmatic levels of adiponectine and OSAS [16, 17].

On the other hand, Makino and colab. have not discovered the connection between adiponectine levels and different levels of OSAS, or correlations between AIH and the mean value of sleep desaturations[18].

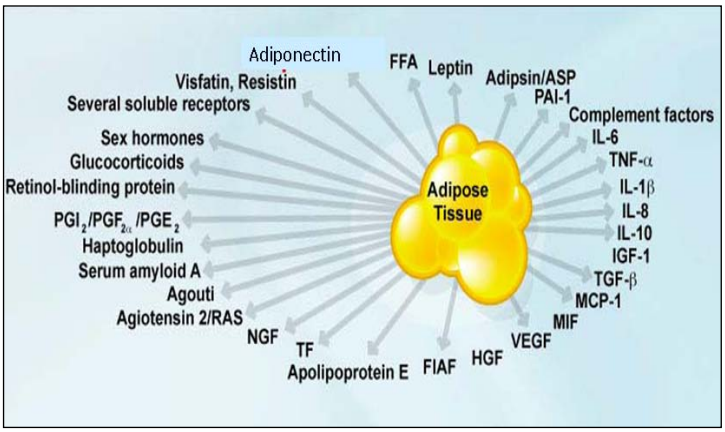

Fig.1 visceral fatty tissue: an endocrine organ [11]

All these physiological pathways: increased GLA secretion, lowered storage capacity of excess energy and adipokine secretion are the mechanism through which the fatty tissue is involved in the etiology of insulin resistance, MS and cardiometabolic risk. Evidence shows that the risk of sleep apnea in obese patients is higher than in non-obese patients. A prospective study on 250 obese patients with a mean BMI of 45,3kg/m2 has demonstrated that 40% of men and 3% of women had sleep apnea. Therefore, 60 to 70% of OSAS patients are obese[19].

Visceral fat is associated with a higher risk of sleep apnea than other disposition of fatty tissue. The visceral fat measured in 37 obese patients has shown a significan association with OSAS [20]. A recent study matched obese sleep apnea patients with obese and non obese controls, and found that apnea patients had a greater visceral fat than controls, and that visceral fat, but not BMI, was correlated with apnea [21]. Several studies indicate that weight loss is associated with improvement of sleep apnea symptoms. Improvement of apneic episodes by weight loss is so

well recognized that weight loss constitutes one of the main recommendations for management of SASO [22]. The best results have reached with surgical treatment of morbid obesity. Large weight losses associated with bariatric surgery greatly improved sleep apnea measurement scores when comparing preoperative and one year postoperative values [23]. The Swedish Obese Subjects study has evidence of significant benefit in sleep apnea measurement values 2 years after the surgery [24]. Another study found evidence of continued improvement in apnea measures 4.5 years after bariatric surgery [25]. Weight loss produced by behaviour, diet, and activity changes also seems to influence sleep apnea, although the results are less robust. Losing cca. 10 kg of weight significantly improved apnea measures in 15 individuals [26]. Weight loss of a mean of 20.6 kg produced by a very-low-calorie diet in 12 patients with sleep apnea resulted in significant improvement in several measures associated with sleep apnea [27]. Very-low-calorie diet treatment in 8 patients produced a drop of mean BMI from 153 to 132 kg/m2 while dropping apneic and hypopneic episodes from 106 to 52 [28]. A recent trial of very-low-calorie diet among 15 obese people found that a reduction of mean weight from 114 to 105 kg significantly improved the oxygen desaturation index (a measure of apnea and hypopnea) [29].

CONCLUSIONS

In conclusion, there is an ongoing debate on whether the correlation between obesity and SASO occurs exclusively because of anatomic factors [30,31]. Although obesity significantly affects upper airway anatomy because of fat deposition, obesity may also be involved in the genesis of OSAS because of metabolic activity of adipose tissue in sleep apnea [32].

The pathophysiology of OSAS isn't completely understood [33,34] and in consequence, the means by which obesity contributes to the etiology of sleep apnea is not fully known [21,34]. One theorized mechanism whereby obesity contributes to sleep apnea development is the enlargement of soft tissues surrounding the upper airways, thus exacerbating the risk for airway collapse during sleep. Whether other central mechanism are also involved in the obesity contribution to sleep apnea, has not been reliably established.

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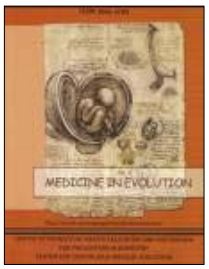
THE ASSOCIATION BETWEEN OTITIS MEDIA WITH EFFUSION AND ALLERGIC RHINITIS



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ABSTRACT

Allergy and otitis media with effusion are often considered comorbidities. Numerous studies point to a role for allergy in the pathogenesis of otitis media with effusion and show the presence of late-phase allergic response inflammatory mediators and cytokines in the middle ear effusion of allergic patients.

We studied the presence of allergy in a group of 134 children with otitis media with effusion between 2004-2009 in the ENT Clinic Timisoara. Allergy has been tested using the dosage in the blood of the total and specific Ig E for respiratory allergens.

Of the 134 children 18 (13.43%) had increased specific Ig E.

The importance of making the diagnosis is that the possibility exists that by treating the allergic rhinitis the chronic OME will resolve.

***Key words**: allergy, otitis media, Ig E.*

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INTRODUCTION

Otitis media with effusion (OME) is an inflamation of the middle ear with collection of fluid and an intact tympanic membrane. OME is affecting up to 80% of preschool children at some time and is the commonest cause of hearing loss in children in developed countries, potentially leading to language deficits. The etiology of OME is probably multifactorial. Middle ear fluid, when cultured, displays infection with viruses (Lim et all, 1984) (Shaw et all, 1995) in 16-19% of children and bacteria (Watson et all, 1996) in 28-43% of cases. The role of allergy in OME has been disputed for many years and the prevalence of atopy varies from 23 to 80% in various articles. Chronic or recurrent OME is common in children with allergic rhinitis and children with persistent or frequent episodes of OME are twice as likely to be allergic (Stenstrom et all, 1994). Allergic rhinitis and otitis media are two of the most common problems in both general and ENT practice. Although frequently benign disorders, they affect the quality of life and represent a significant socioeconomic burden. Allergic rhinitis and OME are often considered comorbidities, both involving an inflamatory process of the upper respiratory tract mucosa. The purpose of this article is to analyse the incidence of allergy in a group of 134 children with OME followed up in the ENT Clinic in Timisoara between 2004 and 2009.

Allergy in the pathogeny of the OME

OME is considered a consequence of the failure of the eustachian tube to ventilate, clear and drain secretions and/or protect the middle ear from nasopharyngeal secretions. The increased incidence in children is multifactorial. However, the major reason for this is primarily related to the functional and structural immaturity of their eustachian tubes and to an immature immune system. The possibility that allergy contributes to OME has been extensively discussed, but not entirely ascertained. Analyses of the effusion content have consistently revealed significantly elevated levels of allergy-related mediators (IL 4, IL 5, IL 6, RANTES, ECP, tryptase, Ig E), as well as differences between atopic and nonatopic patients with OME (Smirnova et all, 2004) (Jang et all, 2003). Eustachian tube disfunction and an impaired mucociliary function caused by allergic reaction of the nasal mucosa can link allergy to OME (Bernstein et all, 1994). Ig E- bearing mucosal mast cells are exposed to inhaled antigens deposited on the surface of the nasal mucosa. Binding of antigen to the mast cells induces the release of inflammatory mediators and cytokines. These molecules can be absorbed locally in the bloodstream with distribution to the eustachian tube and middle ear, can reach the nasopharynx and eustachian tube through mucociliary transport, or can trigger activation of a central neural pathway, producing vascular changes. This way, the edema and congestion of the nasal mucosa can cause disfunction of the eustachian tube (Bernstein et all, 1996). Mucociliary activity may cause secretions to cover the ostium, leading to intraluminal inflamation.

Additionally, hypersecretion of the seromucous glands may result in obstruction of the eustachian tube. It has been shown that allergen challenges (also natural pollen

exposure) can lead to eustachian tube obstruction (Bernstein et all, 1994). Its persistence can give rise to the development of OME. The inflammatory properties in the middle ear of atopic patients are different compared to those in nonatopic patients. The percentage of eosinophil, T-lymfocyte and mast cell mediators is significantly higher in the middle ear effusion of atopic patients with chronic OME than in nonatopic ones (Hurst and Venge, 2000). The levels of interleukins IL 4, IL 5 and IL 6 are also significantly higher in the middle ear effusion of atopic patients (Nguyen et all, 2004). These mediators are essential to a T-helper 2 driven immune response (late phase allergic response) and their presence supports the hypothesis that the middle ear mucosa is capable of an allergic response.

MATERIAL AND METHOD

The study group included 134 children diagnosed with OME between 2004-2009 in the ENT Clinic Timisoara.

In order to establish a diagnosis and a therapeutic conduct, children have been examined by otomicroscopy, audiometry and tympanometry with the testing of the acoustic reflex.

In the cases with suggestive syptomatology or positive family hystory, allergy has been tested using the dosage in the blood of the total and specific Ig E for respiratory allergens.

The tested allergens were: Dermatophagoides pteronyssinus, Dermatophagoides farinae, alder pollen, birch pollen, hazelnut pollen, oak pollen, mixture of herbs, rye pollen, mugwort, plantain, cat, dog, Guinea pig, hamster, rabbit, Penicillium notatum, Cladosporium herbarum, Aspergillus fumigatus and mold.

Table 1 The severity of the allergy has been quantified according to the blood level of the Ig E

Ig E blood level (UI/ml)	Class	Significance
0 - 0.34	0	Absent
0.35 – 0.69	1	Difficult to detect
0.70 – 3.49	2	Slightly increased
3.50 – 17.49	3	Increased
17.50 – 49.99	4	Significantly increased
50 – 99.99	5	Very increased
>100	6	Extremely increased

RESULTS

The age of the children in the study group ranged between 8 months and 16 years. The median age was 4.5 years. The male to female ratio was 1.19:1. Of the 134 children, 24 (17.91%) had positive family history or suggestive symptomatology for allergy. They have been submitted to allergy tests. Of the 24 children, 18 (13.43%) had increased specific Ig E. The allergens most frequently incriminated were: dust mite in 10 cases (55.55%), molds in 8 cases (44.44%), pollen in 7 cases (38.88%), cat in 5 cases (27.77%) and mixture of herbs in 4 cases (22.22%). In 4 (22.22%) cases specific Ig E levels were extremely increased (>100 UI/ml).

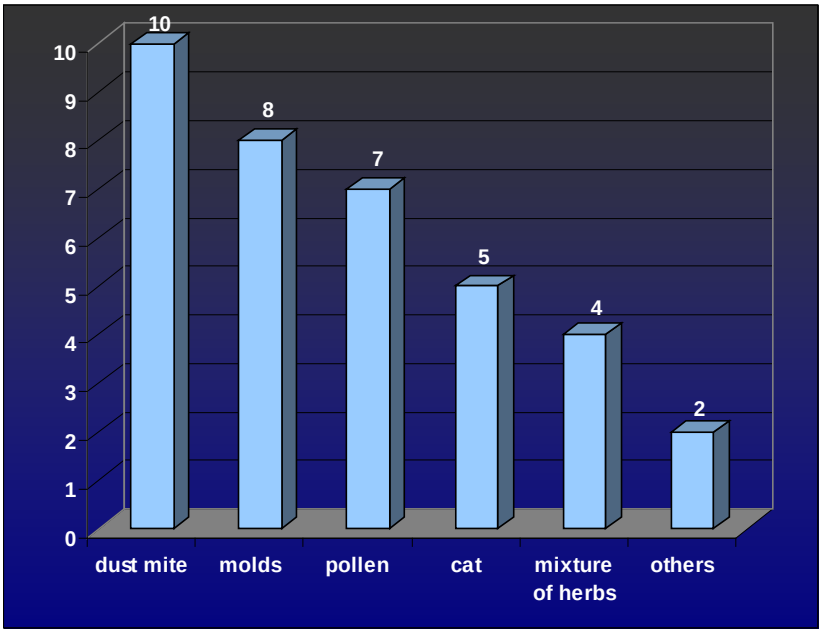

Fig. 1 – Frequence of the allergens incriminated in the study group

DISCUSSION

A high incidence of allergy among children with OME was initially reported in 1983 (Borge, 1983). An association between OME and Ig E sensitization was described a decade later (Corey et all, 1984).

Allergic rhinitis has become a very prevalent disorder, affecting approximately 20 to 25% of the general population. The prevalence of allergy in OME has been reported to be between 12% and 93% (Hurst et all, 2000) (Ogawa, 2002). The wide range of percentages of allergy prevalence in OME is probably due to differences in inclusion criteria, in diagnostic methods for allergy and OME, and in allergens tested. The prevalence in our study group was 13.43%.

The probable mechanism by which allergic rhinitis affects the middle year is via eustachian tube dysfunction. The eustachian tube is normally closed, but opens on yawning and swallowing, thus equalising middle ear pressure to that of the surroundings. If opening is reduced, the air of the middle ear space is

absorbed and a negative middle ear pressure results. This could occur in allergic rhinitis because of the swelling of the eustachian tube lining, which is similar and in continuity with that of the nose and nasopharynx.

Allergic rhinitis sufferers develop a significant negative middle ear pressure following nasal allergen challenge (O'Connor et all, 1984) and, during the hay fever season, as allergen levels peak, there is a proportional increase in the number of subjects with negative pressure (Osur et all, 1989). These subjects, however, don't develop a middle ear effusion. Therefore, negative middle pressure in itself doesn't cause OME. However, in patients with uncontrolled perennial allergic rhinitis, ongoing inflammation will chronically affect the tube. This reduces its opening and the resulting compromised mucociliary function could delay clearance of an acute infective middle ear effusion contributing to the chronicity of the OME.

Allergic rhinitis may also predispose to upper respiratory tract infections. The expression of intracellular adhesion molecule-1 (ICAM-1) in the nasal mucosa in increased in allergies. ICAM-1 is also a receptor for the rhinoviruses, which cause 30% of childhood upper respiratory tract infections (Staunton et all, 1989). Secondary bacterial infection is common following viral colds, and in the presence of negative middle ear pressure and nasopharyngeal colonization with infective organisms, eustachian tube opening may lead to a siphining effect into the middle ear, precipitating an acute otitis media and a subsequent effusion.

Several epidemiological studies have documented associations between OME and allergic rhinitis. Experimental studies have shown a transient tubal disfunction, evoked by nasal allergic reactions in sensitzed animal models or patients with allergic rhinitis, without however resulting in middle ear effusion or histological change in the tympanic cavity (Mogi et all, 1992). On the other hand, antigenic challenge into the tympanic cavity results in mucosal changes and mucociliary clearance impairement.

Rhinitis in childhood is very common and is thought to be frequently infective. In young children, infective rhinitis is thought to be the commonest predisposing cause of OME. Allergic rhinitis is a frequent confounding diagnosis, as is adenoidal hypertrophy. Therefore, in children with persistent OME, allergic rhinitis needs to be actively sought, by a full medical history, physical examination and allergy tests. The importance of making the diagnosis is that the possibility exists that by treating the allergic rhinitis the chronic OME will resolve.

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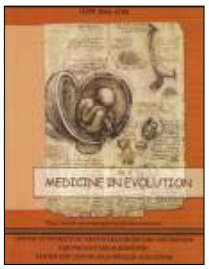
BIO-PSYCHO-SOCIAL ASPECTS IN CARDIOVASCULAR KINETO-THERAPY



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ABSTRACT

Cardiovascular diseases represent the first cause of death in both genders, the problem being an international concern. The multiple risk factors, especially psycho-social factors, incriminated in cardiovascular pathology, impose a psycho-somatic approach on the three prophylactic levels, namely primary, secondary and tertiary. The physical and psychological approach of cardiovascular patients, requires the participation of a multidisciplinary team composed of cardiologist, psychologist and kineto-therapist.

***Key words**: bio-psycho-social, multidisciplinarity, kineto-therapy, psycho-cardiology*

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INTRODUCTION

Since the days of Hyppocrates, who is considered as a true parent of both psycho-somatic medicine (the psyche-soma unity) and of medical kinetology, up to the present, clinical observations successfully brought to the centre of medical debate a series of psychological and kinetic factors which not only directly or indirectly participate to the onset and evolution of disease but are also involved in its cure. Hyppocrates is the first to observe the movement – muscle, immobility – muscular atrophy relationships, as well as the value of of physical exercise in the recovery of muscular strength; he sees kineto-therapy as the best remedy for mental diseases. Still, Aristotle (the phylosopher), who saw human movement as an interaction between muscle and the external environmental forces, is considered to be the founder of kinetology. Psychosomatics is an integralistic (holistic) conception of medicine, due to the fact that it considers not only physycal-chemical and biological factors which participate in the etiology of disease (Engel's bio-psycho-social model) but also psychological factors. Psychosomatics mainly studies psycho-physiopathological mechanisms which convert psychological excitation into somatic activity; i.e. starting from changes in the muscular tonus or cutaneous vascular motility to the disturbance of visceral activity. Less is discussed on somato-psychological disturbances which close a vicious circle together with psycho-somatic disturbances, but their presence is boldly reflected in the life quality deterioration of the diseased person and in his/her relation with the health care team.

The psycho-somatic approach of the patient, according to the bio-psycho-social model, requires working in a multidisciplinary team composed of physician, psychologist and kinetic therapist (if the presence of the three is not possible, the physician and kinetic therapist must have medical psychology knowledge), because the patient is not merely an object needing repairs, he/she inevitably reacts at psychological level, within his ecological-existential area, within his/her universe.

In this approach, two cathegories of problems may be differentiated:

- The impact of psycho-social factors on the individual health (following some psycho-physiological peculiarities) and their capacity to generate pathologic phenomena;
- The organic (neurologic) and psychological resonance to disturbances caused by somatic diseases, including the status of being diseased, both types of resonance representing the somato-psychological consequence of organ pathology.

In cardiovascular diseases, the involvement of the psychogenic factor into the formation and evolution of these diseases – reported to the other etiopathogenic factors – is inequal, the first place being taken by arterial hypertension and coronary heart disease, as widely spread psychosomatic diseases, together with supraventricular paroxistic tahicardia, low blood pressure, Raynaud's disease, neurocirculatory astenia and other less frequent psychosomatic cardiovascular syndromes, such as the primitive cardiac hyperkinetic syndrome. At present, it may be stated that any disease has a psycho-somatic component, the label of psycho-somatic disease continuing to be attached only to those diseases or syndromes in which the etiologic contribution of the

psychogenic factor is important and, sometimes, decisive (triggering a miocardial infarction), being evaluated and instituted as a risk factor for the disease in question. Kinetic therapy, as a speciality with priority application in medicine, is capable of granting the bio-psycho-social recovery of the human being affected by a cardiovascular disease. The specific morpho-physiological element of kinetic therapy, the mio-arthro-kinetic unity, is interconnected with the nervous system which ensures the relation life of the organism, but also with all organs and systems.

As previously mentioned, the fact that the psychogenic element may be considered as a risk or even determinant factor of a disease, similarly, in the recovery of especially cardiovascular diseases, we must aim at influencing and positively charging the human psychic by physical techniques and means, combined with some complementary therapies such as music therapy. For this, the latest theories on the functioning of the human psychic in correlation to the internal and external environment, to the universe, must be known and applied. Today, fields like cuantic physics, transpersonal psychology, cosmic conscience are increasingly discussed. Thus, psychological resonance (intuitively stated by Odobleja in 1938) is a transpersonal energy vibration explained by extended psychosynergy (I. Mânzat), 2008. In the field of physical practice, the study of these aspects might help in formulating some cathegories of objectives, as follows:

The first cathegory of objectives aims at the analysis of some changes induced by physical practice at mechanism level in various functions of organs and systems, such as neurovegetative, endocrine, metabolic, psychic comming to support the balancing of the cardiovascular system; the techniques and means of physical therapy, together with music therapy, will synergically produce a psychological resonance, a vibration, a consonancy, or more, at various levels (spatial consonancy, temporal consonancy, homogenous consonancy, real consonancy, logical consonancy, affective consonancy, thought consonancy, psychological consonancy, physico-psychological consonancy, etc.) with favourable effects in cardiovascular recovery;

The second cathegory of objectives aims at the physical, psychological and social benefits offered by kinetic therapy, such as:

- the physical shape associated to psychological well-being;
- harmony, relaxation, physical slimness;
- additional volitional capacities;
- eliminating frustrations induced by disabilities and anxious-depressive disorders;
- creating a solid motivation for the treatment, by finding a self purpose as well as a purpose for the entourage;
- establishing a resonance between the patient and the health care team;
- using music as a qualified auxiliary (not empirically), in cardiovascular recovery;
- Designisng bio-psycho-social algorithms for an easier learning of some body schemes;
- Shaping mentalities with a wide social resonance in favour of kinetic therapy.

These objectives contribute to a better perception of the importance of kinetic therapy as a therapeutic and prophylactic method in a wide range of cardiovascular diseases.

Principles of the psycho-somatic approach of cardiovascular patients

The psychological dimension of the medical assistance – equally involving a multiple level interpersonal relation with the patient – varies depending on the personal equation of each member of the assistance team. In cardiology, more than in other medical branches, the risk of invalidity or even death, adds an increased severity to the relation between the assistance team and the patient, creating an increased responsability to the former and augmenting the dependance and behavioural regression of the latter. During the first doctor-patient contact, in the case of cardiovascular emergencies, the immediate exclussively medical („technicist") approach with a pregnantly structured psychological support imposes a holistic processing of the patient (together with his or her entire emotional charge dominated by anxiety), the physician having to be also a good psychologist in order to avoid the aggravation of the sufficiently severe state of the patient by true verbal or behavioural mistakes.

Once the emergency moment has been overcome, the cardiologist will decide the moment for commencing physical recovery and will form the recovery team including the kinetic therapist (possibly including the psychologist) and together they will start to adapt to the personality of the patient aiming at the following objectives:

- Psychological adaptation to physical, socio-familial and/or professional exigencies imposed by the disease (these are often discomforting in cardiac patients);
- Creation of an optimistic but responsable attitude towards the evolutive possibilities and socio-professional and sometimes even familial insertion of the patient;
- Including the patient in the assistance team and informing the patient on the stages of recovery.

In achieving these objectives, the team uses psychological knowledge which have been previously learnt in variable degrees thus explaining high differences between physicians (cardiologists) and kinetic therapists concerning their involvement in the psychological problems connected to the patient's complaints. When team work is possible (requiring close cooperation between physician, kinetic therapist and psychologist), a working algorithm may be designed for the psychological approach of cardiovascular patients. The essence of this cooperation requires the assessment of the psychological etiopathogenic component of the disease and the prevention or attempted reduction of the somato-psychological backfire and psychological consequences of the cardiovascular disturbances. This approach includes the instant or gradual evaluation (by further contacts) of the patient's personality type, with concomitant minimalizing explanations of the severity (special attention must be payed to hypochondriacs!), concern (initially discrete, later manifest) for the patient's daily life problems and optimism towards medication, the value of some investigations or examinations and especially towards the prognosis of the disease. In the assessment of the psychogenic factor for the occurence and evolution of the disease, situations may occur when seeking the help of psychologists may be useful (functional cardiovascular disturbances and syndromes, recovery after miocardial infarction and surgical procedures or pace-maker implantation etc. and all the problems caused by the

adaptation to new life changes induced by the occurence or evolution of the disease). Additionally, the psychological examination may be useful especially for difficult patients (usually neurotic patients) and, in extreme cases, a psychiatric evaluation may be required (patients with depression and with neurotic or even psychotic diseases). This orientation of the health care team depends on the psychosomatic education of each member but also on their will to feel fit for being involved in a simultaneous therapy (Petzold) which includes physical and psychological difficulties of the patient, performing a simple supporting therapy. At present, in many cardiology clinics, some forms of group therapy are routinely used with the advantage of „dispersing" the patients' anxieties based upon adequate exercises (among which Schultz's autogenic training has become almost mandatory) coordinated by specially trained psychologists. Bio-feedback and behavioural therapy techniques are also frequently used. Art therapy (melotherapy or painting and sculpture performed by patients) practiced in some cardiology departments has an obvious value, especially in cases when the patients need long term hospitalization or wider effort restrictions.

In Western countries, psycho-cardiology, a new discipline, emerged, specialized in the pathological effects produced by the cardiac psycho-social stress and, in an increasing number of hospitals, cardiologists, specialists in psycho-somatics and psychologists work together in teams.

The health care team acting in the area of recovery may be described as the „recovery team", a multidisciplinary team including professionals who, even if they are not trained in the same fields, have many knowledge in common, especially in psychology and medicine, such as:

- In medicine, elements of psychotherapy;
- In psychology, ways of analyzing the patient's personality and various counselling methods;
- Kinetic therapy offers techniques and means with proven beneficial effects in psychological relaxation, together with other complementary therapies (music therapy).

In this context we may state that the most valuable treatment for patients' recovery, especially for those with cardiovascular diseases is kinetic therapy but only in a psycho-somatic (holistic) approach of the patient. Therapeutic means must be individualized depending on the whole context of the disease, individual reactivity, age, individual peculiarities, and evolution. Functional recovery does not represent a series of randomly applied exercises but an extremely complex procedure where techniques and methods must be carefully chosen and harmoniously combined in order to obtain remarkable results. Disease-oriented must be completed by incapacity-oriented medicine, keeping in mind that the objectives of medicine are not only to prevent and cure disease but also to restore the individual as much as possible to a normal social life. Distinction must be made between the psychology of treatment, the psychology of cure and psychotherapy, because physical methods for functional recovery belong to the specific methodology of physical therapy. Motility cannot exist by itself, and it is in fact psycho-motility with the basic movement elements having to be correlated to language, thinking and social behaviour. The development of motility depends on the maturation of

the nervous system and the ability of interpreting and using stimuli which modify behavioural patterns with the purpose of reaching maximal functionality in relation to the environment. Kinetic therapy is based not upon muscular treatment but on educating and re-educating movement modalities. As for the importance of movement, this is increasingly considered an obvious necessity for each body structure as well as for the entire organism for a good functioning and for maintaining physical and psychological well being.

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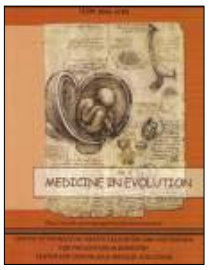
DIAGNOSIS OF NASAL EOSINOPHILIA AND MAST CELLS IN ALLERGIC RHINITIS



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ABSTRACT

***Backround**: The diagnosis of allergic rhinitis is a multi-factorial process. Evaluation of nasal epithelial samples is a part of clinical allergy practice. Throughout the course of allergic inflammation, "the allergic effector unit", the functional interface between mast cells and eosinophils, represents a central functional entity*

***Objective**: The number of mast cells and eosinophilia are both of them important and are interpreted as an additional confirmation of nasal allergy. The present study was made to see the importance of the mast cells and eosinophilia in nasal secretion and biopsies in patients of allergic rhinitis and nasal polyps.*

***Material and methods**: Forty patients suffering from allergic rhinitis, diagnosed on the basis of history, clinical examination and positive skin-prick test were selected for the study. All patients were fully symptomatic with sneezing, nasal congestion and running nose. It was collected by scraping the mucous membrane in the mid portion of inferior meatus (turbinate) and any contact with septum and head of the inferior meatus was avoided. We also harvested a portion of the nasal mucosa at this level and in patients, who had associated nasal polyps, were harvested intraoperatively, fragments of the polyp. All samples were subjected to immunohistochemical analysis.*

***Conclusion**: Mast cells and eosinophils reside in a "niche" in the late and chronic phases of the inflammatory process, which enables the close proximity and tight interactions between the two cell types. These interactions, which can be mediated through soluble and physical pathways of communication, are possibly involved in modulating the severity and/or duration of the allergic response.*

***Key words**: bio-psycho-social, multidisciplinarity, kineto-therapy, psycho-cardiology*

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INTRODUCTION

The diagnosis of allergic rhinitis is a multi-factorial process. In addition to an exhaustive history and a good clinical examination, various tests are used as adjuncts to substantiate the diagnosis. Evaluation of nasal epithelial samples is a part of clinical allergy practice. The number of mast cells and eosinophilia are both of them important and are interpreted as an additional confirmation of nasal allergy. The early phase initiates when an allergen activates the tissue resident mast cell, triggering the release of a variety of granule-stored and newly formed mediators. As the inflammatory response progresses, blood borne inflammatory cells, special eosinophils, are recruited into the inflamed tissue. Eosinophil activation and consequent release and production of several pro-inflamatory mediators results in the late phase reaction. Mast cell reaction within the nose as a whole has been considered important in the development of polyps. Currently, a thorough history, anterior rhinoscopy, nasal endoscopy, skin prick test, specific IgE analysis, rhinomanometry, nasal provocation test and nasal cytology, as diagnostic battery, are used for the diagnostic. The present study was made to see the importance of the of mast cells and eosinophilia in nasal secretion and biopsies in patients of allergic rhinitis and nasal polyps.

MATERIALS AND METHODS

Forty patients suffering from allergic rhinitis, diagnosed on the basis of history, clinical examination and positive skin-prick test were selected for the study. The battery of common aeroallergens namely: grasses-cereals, trees, flowers, Dermatophagoides pteronyssinus, Dermatophagoides pharinea, cat and dog allergens, Penicillinum, Aspergilus, Cladosporum, Alternaria, Candida, Sacaromices mellis. Eosinophilia was studied before and after immunotherapy treatment and local or systemic corticosteroids. All patients were fully symptomatic with sneezing, nasal congestion and running nose.

For nasal cytology, after exces cytology secretion was cleared, both sides of the nose were sampled by using a cotton applicator, air-dried. It was collected by scraping the mucous membrane in the mid portion of inferior meatus (turbinate) and any contact with septum and head of the inferior meatus was avoided. We also harvested a portion of the nasal mucosa at this level and in patients, who had associated nasal polyps, were harvested intraoperatively, fragment of the polyp. All samples were subjected to immunohistochemical analysis.

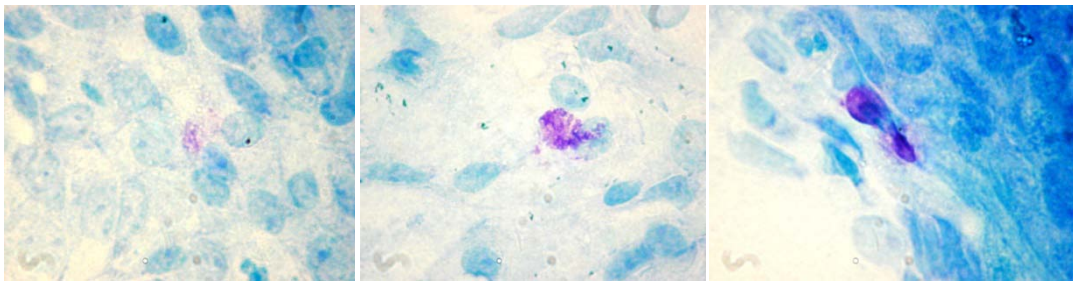
Fixation was performed in 10% buffered formalin for 48 hours. The amount of fixative used was approximately 20 times the amount of the harvested piece. Then the remove of the retainer was made by washing with running water for 2 hours. After the retainer was removed, the pieces were incluzionate in paraffin. Segmentation was achieved by microtome, achieving 3µ sections that were sticked with defatted albumin Mayer on histological slides and spread in hot aqueous environment. Drying was achieved by placing slides in 37 C for 20-30 minutes. Dewaxing was done by a thermostat bath at a temperature of benzene at ˚57 C for 30 minutes,

followed by two baths of benzene at room temperature, for 10 minutes each. Hydration was achieved by passing dewaxed sections by successive baths of decreasing alcohol concentration 100%, 96%, 80%, 70%, 10 minutes each bath, followed by a distilled water bath for 10 minutes. From this point the sections were colored. The pieces were stained with hematoxylin eosine morphologically for histopathological diagnosis. We studied at the 40 cases the mast cells density, the type, the degranultion and the eosinophilia density.

The density of mast cells was monitored both on histological sections and cytological preparations. The smears were stained with polychrome blue method tannin (APT Dragan).

RESULTS

In the cases where we haven't identified mast cells, the slide material was insufficient for interpretation. In the cases where we had enough material for interpretation, we observed mast cells arranged in groupesd, degranulate or partially degranulated but also isolated mast cells. All isolated mast cells were degranulated. Also we noticed a large number of eosinophils, plasma cells and granulocytes in the patient with nasal polyposis. There was no correlation between the proportion of eosinophilis and mast cells in the lesions.



a. Degranulated, metachromatic mast cell, APT Drăgan coloration, ob. X 100
b. Partly degranulated, metachromatic mast cell, APT Drăgan coloration, ob. X 100
c. Mast cells with orto- and metachromatic granulations, APT Drăgan coloration, ob. X 100

We interpret nasal eosinofilia before treatment, using a scale:

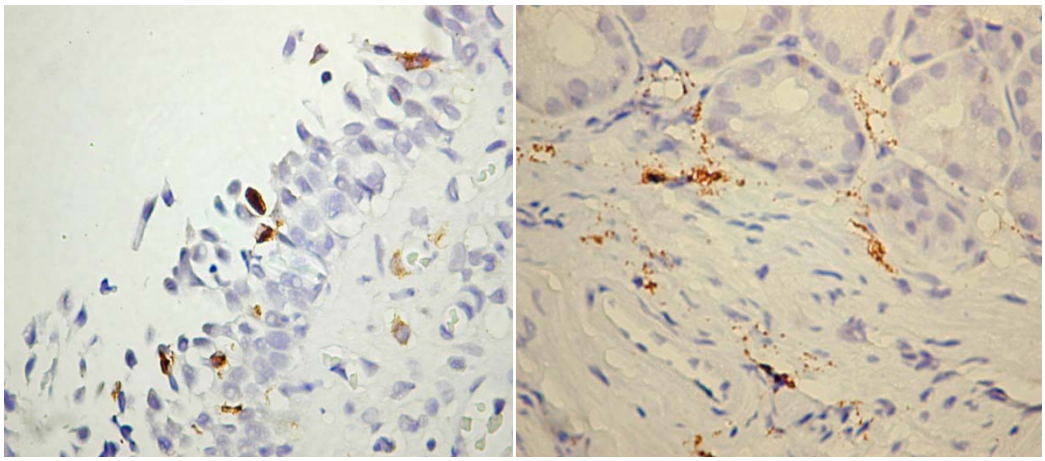
+	< 5% eosinophils	no eosinophilia	normal
+	> 5% eosinophils	slight eosinophilia	doubtful
+ +	< 50% eosinophils	moderate eosiniphilia	pathological
+ + +	> 50% eosinophils	marked eosinophilia	pathological

We found nasal eosinophilia in about 90% of the cases before treatment and just 10% after treatment. The eosinophilia was related to the type of the nasal discharge (watery, mucoid, mucopurulent) and the colour of nasal mucosa also (dull red, pale, greysh blue).

Colour of nasal Mucosa before treatment	Eosinophilia in nasal smear before treatment				
	< 5 %	5-10 %	< 50 %	> 50 %	total
dull red	3	4	5	3	15
pale	5	4	7	4	20
greyish blue	0	0	5	0	5
total	8	8	17	7	40

On the hystological sections the mast cells have been stained by immunohystochemy with anti-tryptase antibodies, clone A1, using the En Vision work system. The tryptase is the constitutional marker of these cells. For the immunohystochemical staining the 5 µm sections have been dewaxed in benzen and rehidrated using successive baths in ethanol with decreasing concentrations (100%, 95%, 80%, 70%), and washed afterwards with distillated water. The evidentiation of the antigen needed the immersion of the slides in EDTA solution with pH 9 and heated in microwave for 15 minutes in three succesive cycles. After cooling at room temperature in revealing solution we realised the blocking of the endogenous peroxidase with oxigenated water 3% for 5 minutes. The incubation with the primary antibody was realised for 30 minutes at room temperature. We used the antitryptase monoclonal antibody, clone A1. The compatible work system was the LSAB+ type, and the cromogen applied was 3, 3" diaminobenzydin dihydrochloride, visualised by a brown reaction. The nuclear coloration was done with modified Lille hematoxylin. The mounting was realised in permanent mounting medium (Canada balm). The interpretation of the tryptase was realised with the Nikon Eclipse mycroscope, and the images aquired in JPEG format. The mast cells were quantified by the „hot-spot" method. We identified mast cells in the lamina propria, disposed mainly around the blood vessels. The majority of the mast cells were perivascular, which confirms the preferential location of these cells around the blood vessels. In the cases with allergic rhinitis the mast cells were situated in the connective tissue of the lamina propria. At this level we observed isolated or grouped mast cells around the blood vessels, most of them degranulated, but also partially degranulated or even mast cells that don't degranulate. We also remarked granules among the collagen fibers. In all the cases with allergic rhinitis we observed a condensation of the mast cells in the proximity of the epithelium, disposed in groups, most of them degranulated. In these cases we also observed intraepithelial mast cells, isolated between the epithelial cells of the pseudostratified epithelium or in small groups of 3-4 mast cells. The eosinophiles and granulocytes were in small number or even absent. Only in one case of allergic rhinitis we observed a large number of eosinophiles (47 eosinophiles/field). In all cases with allergic rhinitis we observed the same distribution of the mast cells but with significant differences in number between these cases. In some of the cases the mean was 20 mast cells /field, while in other 5 mast cells/field. In the cases with asthma associated with allergic rhinitis and nasal polyposis, mast cells had the same distribution, in the connective tissue of the lamina propria, between the seromucous gland

situated at this level. Between the glands the number was smaller than in the periglandular connective tissue. They were situated mainly around the blood vessels. Almost all the mast cells were degranulated and only a few partly degranulated. In these cases most of the mast cells were situated far from the respiratory pseudostratified epithelium. We also identified intraepithelial mast cells but in a smaller number than in the cases with allergic rhinitis. In the epithelium the mast cells were isolated between the epithelial cells and only a few in small groups of 2-3 mast cells. In the majority of the cases the eosinophiles and granulocytes were absent or in small number. Only in two cases we observed a larger number of eosinophiles and granulocytes. In these cases we identified granulocytes and eosinophiles also on the cytological examination with APT Dragan.



a. Intraepithelial mast cells, some partly degranulated, and also in the lamina propria around the blood vessels; immunohystochemical coloration with antitryptase, ob. X 10
b. Numerous degranulated mast cellsin the lamina propria around the blood vessels, mast cells granules among the collagen fibers; immunohystochemical coloration with antitryptase, ob. X 10

11 patients in the study group were diagnosed with nasal polyps. 4 patients had negative seric level IgE and 2 patients had negative prick test. Two cases had negative IgE and prick test negative. Elevated levels of IgE or prick test negative may be found in nasal secretion in nonatopic subjects also. Some autors (Ruhno et al 1990, Otsuka et al 1993) have shown that the epithelial mast cells in nasal polyps are equally elevated in nonallergic and allergic patients. Otsuka demonstrated that the increase in epithelial mast cells was directly proportional to the thickness of the epithelium. It is not necessary to be result of athopy or infection.

CONCLUSIONS

The allergic response is composed of two main phases: the early and the late. The early phase initiates when an allergen activates the tissue resident mast cell, triggering the release of a variety of a variety of granule-stored and newly formed mediators. As the inflammatory response progresses, blood borne inflammatory cells, in particular, eosinophils are recruited

into the inflamed tissue. Eosinophil activation and consequent release and production of several pro-inflammatory mediators results in the late phase reaction. A chronic allergic inflammation always features proeminent tissue eosinophilia. Throughout the course of allergic inflammation, "the allergic effector unit", the functional interface between mast cells and eosinophils, represents a central functional entity. Mast cells and eosinophils reside in a "niche" in the late and chronic phases of the inflammatory process, which enables the close proximity and tight interactions between the two cell types. These interactions, which can be mediated through soluble and physical pathways of communication, are possibly involved in modulating the severity and/or duration of the allergic response.

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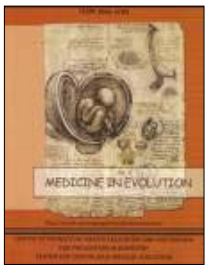
PALATE MUCOSAL GRAFT IN LOWER EYELID RECONSTRUCTION AFTER TUMOR RESECTION CASE REPORT



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ABSTRACT

In maxillo-facial tumor pathology, cases with eyelids tumors are raising serious problems in oculoplastic reconstruction after tumor resection. Anatomically, the eyelid is composed of anterior lamina (skin and orbicularis oculi muscle) and posterior lamina (conjunctiva and tarsus). Defects in the anterior lamina can be easily repaired with skin grafts or flaps. For reconstruction of the posterior lamina, there are several choices: eyebank sclera, ear cartilage, autologous tarsoconjunctiva, nasal septum, and temporalis fascia, none of these materials could be considered ideal to obtain the expected outcome.

Our patient, G. I., 71 years of age, presented a right naso-palpebral ulcerative tumor with approx. 1 year of evolution. Preoperatively, exfoliative cytology orientated the diagnosis, which indicated a malign neoplasm. Tumor resection and oculoplastic reconstruction represented the treatment of choice. In tumor defect's reconstruction it was used, this time, the hard palate mucosal graft with epithelial keratinized surface facing the globe (posterior lamina), and anterior lamina was reconstructed with an advancing genio-palpebral flap which was closely applied to submucosal surface of the graft.

The flap survived and the graft attached to this developed new eyelids. The esthetic and functional outcomes were good, so that the hard palate mucosal graft was proved to be a useful treatment option.

***Key words**: palate mucosal graft, oculoplastic reconstruction, eyelid.*

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INTRODUCTION

In eyelid surgery, grafts are frequently required for the reconstruction of eyelid deformities and defects, as well as post-tumoral defects. Anatomically, the eyelid is composed of anterior lamella (skin and orbicularis oculi muscle) and posterior lamina (conjunctiva and tarsus). Defects in the anterior lamina can be readily repaired with skin grafts or flaps. For reconstruction of the posterior lamina, there are several choices, including eyebank sclera, ear cartilage, autologous tarsoconjunctiva, nasal septum, and temporalis fascia. But the ideal material for replacement of the posterior lamina is still lacking. In 1985, Siegel described utilizing hard palate mucosal grafts in eyelid reconstruction after tumor excision[1]. Since then, hard palate mucosal grafts have gradually become popular as alternative materials in several areas of oculoplastic surgery [2,3,4,5,6,7].

CASE REPORT

Anamnesis and clinical examination data

Our patient G. I., 71 years of age has an ulcerative skin tumor located on the internal half of the lower eyelid, involving also the internal canthus and 0,5 cm of the medial upper eyelid, right side of the face, for appreciatively 1 year, with superficial irregular margins, modified in color, which is also extended in the lateral aspect of the nasal area (fig.1.).

Laboratory data

Before surgery, we performed an exfoliative cytology and the results had the purpose to orientate us about the diagnostic, malignant or benign, meaning basal cell carcinoma.

Histological examination after excision revealed a basal cell carcinoma with tumor free margins.

Treatment and evolution

The tumor was excised together with a 4 mm surrounding tissue of normal eyelid tissue (fig. 2.). The full-thickness defect of the lower eyelid measured 5 mm × 19 mm and that of the upper eyelid 4 mm × 8 mm.

Fig. 1 Right naso-palpebral ulcerative tumor.

Fig.2 A large full-thickness defect of the eyelid and defect of lateral aspect of the nasal area after safety borders tumor excision.

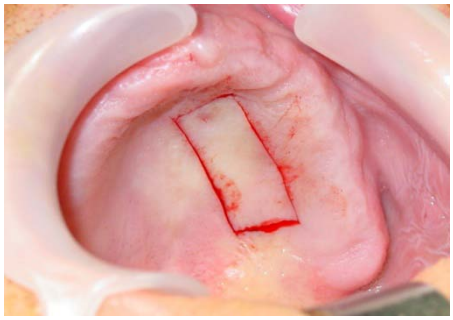

Fig. 3 Incisions for harvesting the mucosal palatal graft.

Fig.4 Palatal mucosal graft sutured in position for reconstruction of the posterior lamina of the eyelid, facing the globe.

Harvest of mucosal graft was carried out under local anesthesia. The desired site of the palatal graft was located between the midline palatine raphe and medial gingival surface of the teeth or alveolar crest in edentulous patients (Fig. 3.). This region is made up of a paired area that constitutes most of the roof of the mouth. In this region the submucosa is well defined. This fatty and glandular submucosa clearly separated the mucosa from the periosteum. The dissection for harvesting hard palate grafts occurred in the submucosal plane. The fatty submucosa adherent to the graft was then excised, leaving the mucosa, which consists of epithelium and firm, collagenous, lamina propria. Care was taken to avoid violating the soft palate mucosa, the exit of the greater and lesser palatine arteries, and the nasopalatine artery. The hard palatal mucosa was outlined with a marking pen. The usual graft size measured about 10 × 30 mm. After local anesthesia, a no.11 blade was used to incise the mucosa about 2 mm to 4 mm deep, taking care not to penetrate the mucoperiosteum. The edge of the graft was lifted and dissected from the submucosa by a crescent knife. The graft was stored in gauze moistened with normal saline solution prior to use. The donor site was covered with absorbable gelatin sponge (Gelaspon), and the patient was asked to bite down on a gauze mouth pack for twenty to thirty minutes to decrease wound oozing. A soft diet was given for 3 to 5 days before resumption of a full diet.

For reconstruction of lower lid defect after tumor excision, a scissor was used for blunt dissection between the orbicularis oculi muscle and orbital septum, and the anterior lamina of the lid was elevated. Hard palate mucosa was harvested and sutured to the tarsoconjunctival defect and fixed laterally and inferiorly for posterior lamina reconstruction (fig. 4.). The mucosal surface faced the globe.

The size of the palatal mucosal graft was 10% larger than the size of the tarsal defect. The graft was sutured to the defect with 6-0 vicryl suture. The anterior lamina defect of the eyelid was repaired by an advancing skin-muscle flap. The skin-muscle flap was advanced to cover the mucosal graft, and suture was used for 7 to 10 days to keep close contact between the flap and the graft (fig. 5.). Antibiotic ointment was applied to the lower fornix and the lid skin. The flap survived and the graft took completely with excellent cosmetic eyelid appearance. Six months after the operation, there was no tumor recurrence and the eyelid contour appeared nearly normal. No major donor site complications, such as wound infection or palatal perforation

occurred. Our patient had prolonged palatal bleeding which was controlled adequately with local compression (fig. 6.). The donor site wound healed by second intention, and complete reepithelialization was found in the first month following surgery.

Fig.5 The skin-muscle flap sutured in final position over the bloody part of the mucosal graft.

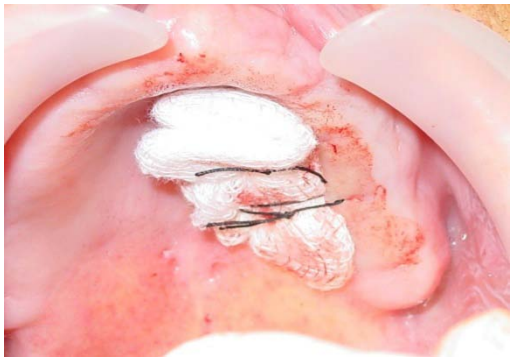

Fig.6 Local retained compression for bleeding control.

DISCUSSIONS

Following their initial use in reconstruction of oral defects, palatal grafts have been applied in periodontal surgery, lip reconstruction, and tracheoplasty [8,9,10]. In the last two decades, these grafts have been used for repair of defects and deformities of the posterior lamella of the eyelid, such as in lower eyelid reconstruction, severe cicatricial entropion, facial nerve palsy, lower eyelid retraction due to Graves' disease, and cicatricial post-traumatic changes.

To understand the recent enthusiasm for palatal grafting, it is necessary to compare various grafting materials. Theoretically, the best choice is autologous tarsoconjunctival grafts, but their limited availability precludes their wide spread use. Among other autologous grafts, ear cartilage and nasal septal cartilage are structurally similar to the posterior lamina, but it is difficult to take the curvature of the lids due to memory of cartilages, and these grafts are associated with donor site morbidity. Temporalis fascia and fascia lata grafts are readily accessible but provide poor structural rigidity. Homologous grafts, e.g. eyebank sclera, have no donor site morbidity yet significant post-operative shrinkage and occasional graft rejection occur.

Hard palate mucosa, an autologous graft, is composed of two layers: A mucosal surface and a fibrous collagen base, so it is structurally similar to the posterior lamina of the eyelid which has a soft lining conjunctiva and a tough tarsal base. In addition, its autologous origin avoids necrosis due to immune reaction, and the supporting fibrous collagen base resists contracture of the graft after surgery. Palatal grafts usually shrink up to 10% to 15% during the first 4 weeks of healing with excellent stability thereafter [11].

Despite the superior quality and quantity of palatal grafts, many surgeons are not familiar with this graft and may hesitate to utilize this material. The graft harvest procedure is simple and associated with little

morbidity [12,13]. Major morbidity of the donor site, such as oronasal fistula due to palatal perforation, or wound infection, is rarely seen [14]. Though significant wound bleeding occurs occasionally, as seen in two of our patients, it can be easily controlled by local measures. The graft bed reepithelializes rapidly in two to three months, and harvest of a second graft from the same site is even possible [15].

The eyelid defect after tumor excision was successfully repaired (fig. 7.). Our reported patient increased ocular discharge in the first few months. This phenomenon is caused by keratinization of the palatal mucosa. In humans, the epithelium of the conjunctiva is non-keratinized, and that of palatal mucosa is keratinized. Therefore, keratin formation in the palatal graft could result in increased discharge. Fortunately, metaplasia of the keratinized mucosa to non-keratinized tissue may occur during the first six months [5], and the discharge then improves as described (fig. 8.).

Fig.7 The cosmetic outcome after 3 months.

Fig.8 The viable palatal mucosal graft in place.

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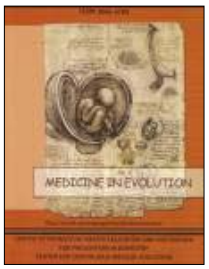
ACCESSIBILITY AT DENTAL CARE IN TIMIS COUNTY



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ABSTRACT

The accessibility at medical care refers to the easiest way for the patients to obtain the medical care when they are in need. At European Union the frequency of dentists is 66, 6/100 000 people, and in Romania is 20, 2/100 000 people. Between may and july in 2009, we have been realized a study about dental care accessibility in Timis County, looking to geographical, organizational and institutional accessibility, aren't this type of study in this area for the moment. Based on this study we evaluate the weak points of dental services, with then ulterior aim to try to improve the quality and dental accessibility, either emergencies or periodical controls.

Methods: *Evaluation of dental care in Timis County, by analyzing the geographical repartition of dentists, their cabinets, and emergency services; institutional and organizational accessibility by questioner application at 100 dentists from Timis County, from they 12% work in rural area.*

Results and Conclusions: *From this study we observed the follow negative aspects: geographical beat in the east and north-east area of the county, equipment the dental cabinets for people with handicap, the majority of dentists are not available to treat the seropositive patients or patients which are positive for hepatitis B or C virus, and all of them which are available they will give tshe dental care just in the end of program, almost all of the cabinets don't show the prices list in the rest room, in the rural area in the rest room they don't have toilets or they don't have any rest rooms.*

Key words*: dental care, dental cabinets, medical care.*

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INTRODUCTION

The accessibility to health care means the ease with which patients can get care they need when they need it. Between May-July 2009, we reviewed a study on the accessibility of dental services in Timis County, the geographic, organizational and institutional, with no such study to date. How the modern concept of quality father, Donabedian [1] describes quality health care as "those who expect treatment to maximize patient welfare dimension, taking into account the balance of gains and losses expected to occur at all stages of health care" in 1973 [2] defined accessibility as a feature which facilitates or hinder resource potential patients. He distinguished socio-organizational accessibility (age, race, social class) of geographical accessibility (time, distance, transportation cost).

Timis County is located in the western, historical Banat region of Romania. The county's geographical location is very convenient, at a crossroads of major European roads where crops and interfere with the Western civilization from the east. Nearby are two European capitals: that of Yugoslavia, Belgrade, and that of Hungary, Budapest Timis County, Romania's largest county, with an area of 8697 km square, has a temperate climate, has two thirds of the territory covered plains crossed by rivers Timis and Bega, Barzava. To the east the plain gentle hills covered by vineyards and orchards to the average height of Poiana Rusca Mountains (1300, 1400m). At the last census in 2002 had a population of 677,926 of which 63.47% live in urban areas. The population consists mainly of Romanian 83.47%, Hungarians 7.46%, Roma 2.37, 2.05 and the rest are Serbs German, Hebrew, Greeks, Ukrainians, Bulgarians, Czechs, Slovaks, Italians.

Of economically is Timis first on country after Bucharest, in terms of living standards indicators, gross domestic product per capita is the most synthetic indicator is 7335 per capita, with almost 40 per cent than the national average. There are different levels of develop-ment between urban and rural areas both economically and current water supply and sanitation, they lack both public institutions and in households. Timisoara Timis County has two county capital is important and university, Lugoj and six cities: Recaş, Făget, Deta, Sânnicolau Mare şi Jimbolia and 89 villages.

Given all these details about Timis County we evaluated the dental care accessibility has evaluated the accessibility of geographical accessibility and institutional will to pursue the future and financial accessibility to patients, because access to health services is related to the standard of living of the population. A large number of people are insured while (children), have limited access to dental care, given the very limited household budget. Poor families can not afford the payments involved the application of health services, purchase of necessary medicines, pay transportation costs and pay for necessary medical services.

Geographical accessibility (spatial analysis) at dental health services. Relationship between geographical accessibility and volume of services consumed appears to depend on time and type of care needed resources. By increasing access by lowering the distance, reduced journey times and reduce transportation costs likely will increase use of health services associated with fewer complaints [1].

Institutional accessibility Organizational accessibility is important to

describe the doctor-patient relationship. They are very clear: interest, empathy, respect, kindness, willingness to invest time, effort to explain the attention to patient desires, honesty and courteous behavior are essential ingredients in providing good therapeutic services [3]. They summed values of professions and include therapeutic services offered by the characteristics we want in any kind of interaction in a civilized society [4]. Factors which create difficulties' at accessibility of dental health services are: time spent waiting for patient dishes, delays in scheduling, equipment waiting rooms, and doctor's compliance to the needs of patients and ensure their availability for emergencies at night and weekends.

METHODS

In the study described here was done evaluation bud accessibility to dental health services in Timis County in terms of dentists, by:

1. *Geographical analysis* of the distri-bution of dentists, their cabinets, emergency services. Geographic mapping analysis included both doctors dental contract with the Health Insurance Timis County and to those who have the key to this contract, the data from Timis Dental College, performed using GIS software, Map Maker 3 free version. We also examined the geographical accessibility, and in terms of available transport to get to the nearest dental office with maps CFR for Timis, Timisoara Transport Autonomous Adminis-tration District.
2. Institutional and organizational accessibility by applying a questionnnnaire of 16 questions to 100 dentists, of which 12% were from rural areas, which have pursued the following: the existence of waiting room, its equipment for people with physical disabilities and not only existence of toilets for both patients and physicians as pro-viding hygienic rules, time spent by patients by appointment in the wai-ting room display prices charged by doctors in the waiting room, their availability to work outside normal working hours, the provide emer-gency if needed on weekends or at night, their availability to treat patients infected with HIV / AIDS or hepatitis B or C.

Obtained from the questionnaires we have created a database in Microsoft Excel version 2007, and the database was processed with the program Epi Info 3.2.4: calculate frequency. Graphic representation was performed with Microsoft Excel version 2007.

RESULTS

I. Analysis of dentists practicing in Timis

In the Timis County dentists have the 1083, with a frequency of 159.75 dentists per 100 000 inhabitants, which is approximately 2.6 times the frequency of dentists in the EU (population 66, 6 dental doctors /100 000) and about eight times higher than our national average (20.2 dental doctors /100 000 inhabitants). This is explained by the fact that the center is Timis County University of Timisoara, Faculty of Dentistry and has many college graduates remain in Timis County to practice. Analyzing the distribution of dentists in Timis county depending on operating environment I noticed a huge disparity between urban and rural areas as 95% of all dentists in Timis County operating in urban areas,

and only 5% rural, or a dentist to 417 people in urban and one dentist to 4854 people in rural areas, which is completely different from the recommenddations of the European Union say that would be a dentist to 1,500 people in urban and a dentist for a population of 2000 inhabitants in rural areas. In conclusion, there is Timis 4 times more dentists in urban areas and 1.5 times fewer doctors in rural areas. Moreover frequency dentists per 100 000 inhabitants in urban areas is about 10 times higher than the national average and four times the EU average, while in rural areas is 1.5 times higher than national average and approximately 2 times lower than the EU average.

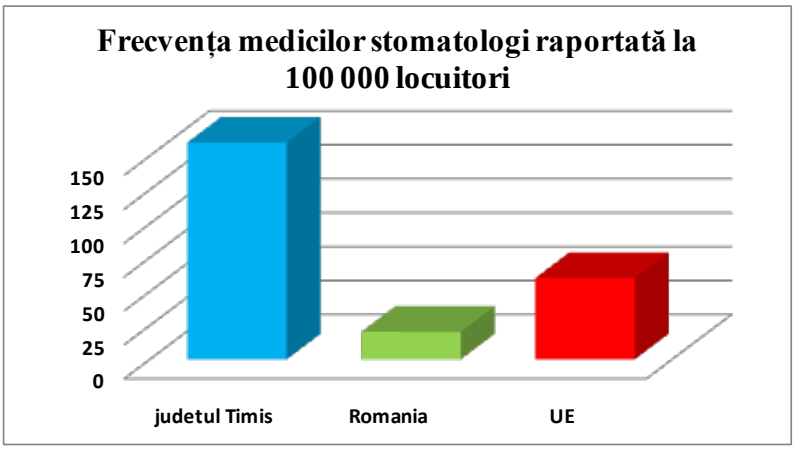

Fig.1 Dentists by the average frequency of our country and the European Union

II. Analysis of spatial distribution of dental health services and accessibility in Timis:

1. Analysis of spatial distribution of dental offices:

As we can see in Fig.2 general dental practices in the Timis County are relatively uniformly present in the central and west, and less present in the east.

Note that each community around the central and west from there at least a general dental office, making the geographical accessibility of population to these services is relatively good.

Most dental offices are in Timisoara, numbering over 500, and around this city we see a cluster of cabinet a radius of about 35 km.

2. Frequency analysis of dental practitioners in Timis County, by localities

Analysis of all physicians. Coverage is Timis County dentists by 100% in urban and in only 55 communes of the 84 communes and the 29 villages remaining uncoated 22 are in the eastern and northeastern part of the county. As for general dental offices (see Fig.2) to the east and northeast of Timis County is very poorly covered in terms of geographical accessibility to dental care, which is well represented in urban area and seven villages, 24 communes from Timis County the remaining fully revealed in terms of geographical coverage of the county dentists. Average kilometres that people in these rural villages and must traverse to reach a general dental practice is approximately 30 km.

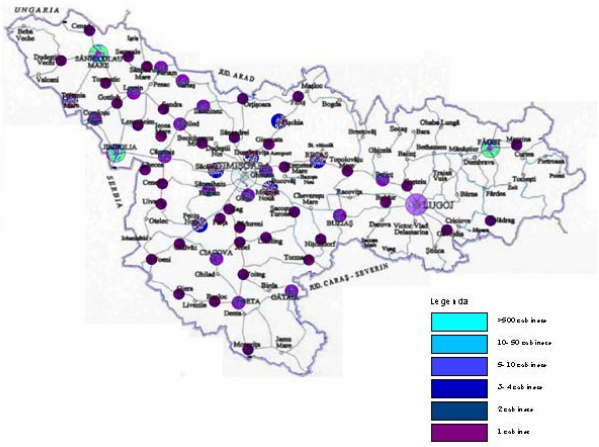

Fig. 2 Mapping general dental offices in Timis

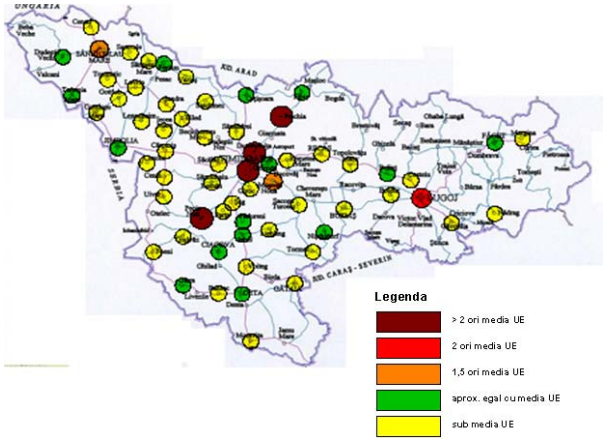

Fig.3 Frequency of dentists per 100 000 inhabitants per village reported to the EU average (66 dentists per 100 000 inhabitants)

Dental doctor's analysis in agreement with CJAST

Analyzing Figure 4, we see that urban areas are relatively well represented in the dental services contract with CJAS T except Ciacova city which show no such practice. Coverage in rural areas is common in 44 of 84 in the county. Of the 40 common non dentists, 28 are from the eastern and northeastern county. Frequency of most dentists per 100 000 inhabitants is located in two towns in rural Peciul Nou and Giera dental doctors being above the average EU dental doctors/100 000 inhabitants.

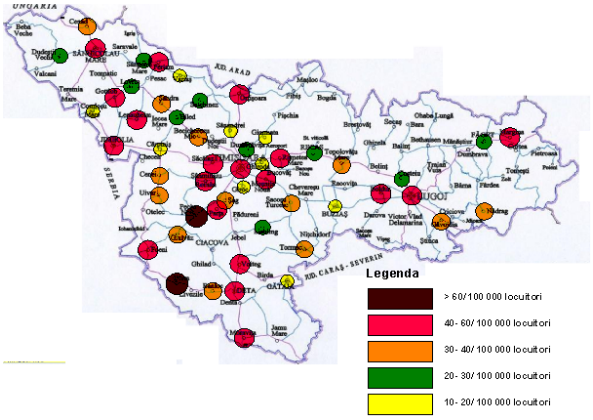

Fig.4 Frequency of dental practitioners in contract with Health Insurance Timis County, at 100,000 inhabitants

Accessibility to specialized dental care servicies

Of all dentists in Timis County, 24 are surgeons and specialists of these are dental alveolar surgery and the remaining eight are specialist maxillo-facial, 47 are orthodontics, and 67 are medical residents in training. We meet the general medical specialty dental services in Timisoara, and also dental

alveolar surgery in the Ciacova area and orthodontic services, dental school and in Lugoj, than those of Timisoara.

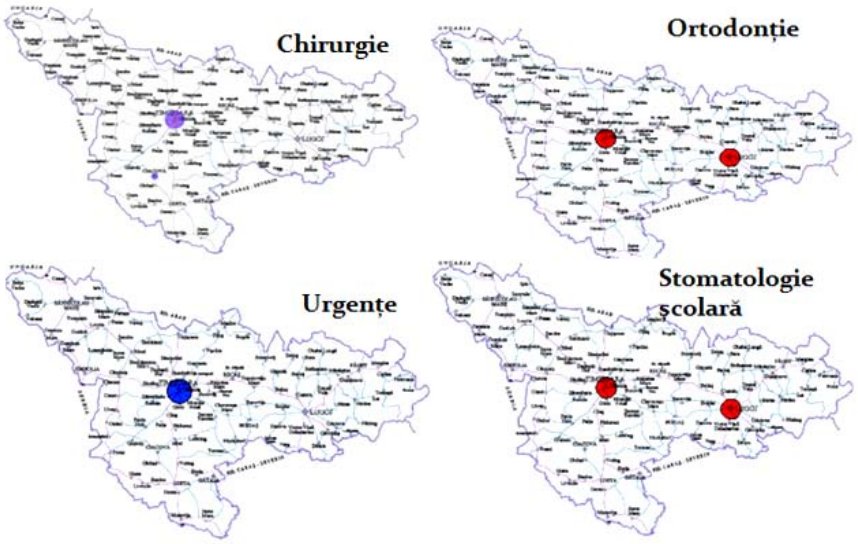

Fig.5 Accesibility at dental care, servicies in Timis County

III. Accessibility of services dentists in terms of vehicles

Analyzing the common transport in Timis County, we can say that in the most poorly represented by doctors and dentists and is underrepresented in terms of transport. Thus we have several critical points in the district such as:

- Ohaba Lunga inhabitants (1219) which is just 45 km and 30 km from Lugoj to Faget town has no railway line just 16 km away where you can take the personal train to Lugoj (50 minutes) or to Faget (35 minutes), the only bus running from this city to Lugoj town, where the nearest dentist, 2 times per week on Tuesdays and Fridays, and is on a paved public highway about 10 km distance;
- inhabitants Zolt (218), are approximately in the same situation as the inhabitants of Long Ohaba, only the living area is a mountain road is unpaved and leads to this location is more difficult to access;
- Pietroasa inhabitants (1514), train way that is relatively far from common, about 10 km, and can be reached by bus once a week in Lugoj and two times in the city Faget. However the nearest dentist is in Romanesti locality, which is Timis CJAS and contract, about 15 km, but the cabinet is open daily and access in this locality can be made only by private cars.

These villages are the most disadvantaged in terms of vehicles, access roads and the frequency of dental practitioners in these areas. The county is well served by rail network, the Autonomous Transport and Roads in relatively good condition not hinder access to a dental surgery.

IV. Accessibility of institutional and organizational analysis

IV.1. Accessibility institutional

Accessibility refers to the institutional offering institution to be more accessible, for example: creating enough parking spaces, the existence of patients disabled access ramp into the building and toilets, providing medical

services patients with various communicable diseases like: HIV, hepatitis B and C, flexible program to be accessible to more people.

We analyzed the questionnaire and additional data received from dentists' institutional accessibility Timis County, where we could draw the following conclusions:

- All dental offices have waiting room at least two seats, most doctors to patients in the waiting room for drinking water and magazines or television to pass their time better;
- The average dentist appointment patients are forced to wait on average 23 minutes in both urban and rural. In urban areas it is possible depending on the cabinet to wait until 50 minutes;
- Only 36% of dentists have prices shown in the waiting room and they all are in urban areas, which get away certain social categories demand these services;
- 71% of the doctors interviewed claimed that the cabinet where practicing offers special toilet for patients in the waiting room entrance, but only eight of whom were rural physicians. Of these only nine doctors had toilets and bar provided for persons with mobility impairments, which disadvantage the social category;
- only 66% of practices have studied the ramp or do not need it, can be accessible to handicapped people;
- 14 surgeries, all of Timisoara have special parking facilities for patients and 30 of the doctors interviewed in rural areas and small cities contend that enough parking on roads in front of the cabinet, not hamper motor vehicles on the road.

IV.2. Organizational accessibility

In Timis county 226 practicing dentists in Timis CJAS contract and these services primarily benefit children. Patients with HIV, hepatitis B, or C, are treated only by some doctors, 40%, in Timis county, of which 87.27% practicing in urban areas. The dental office is located in a larger town, is better equipped, the more willing to treat patients with HIV, hepatitis B or C. Most of the doctors are not willing to treat such patients, only to end program hampering access to this patient population to dental treatment. These realities mean that many of those suffering from one of these diseases do not recognize the disease when presented to physicians, thereby increasing risk of disease transmission by negligence of doctors. Analysis of doctor-patient relationship in Timis county, in terms of dentist, with six of the questions in the questionnaire (see questionnaire data processing), the following was observed:

- 62% of dentists are available in Timis County to sue over the program, or to mold the program to suit patients, of whom 87.27% are physicians practicing in urban areas;
- 47% of dentists surveyed accept emergencies at any time, 33% accept emergency cases on weekends. Of these over 80% of those who are practicing in urban areas;
- Emergency dental services are covered in our county emergency service delivery to Timisoara and dentists who are willing to deal with emergencies at any time;
- Time programming to get the dentists in Timis County is good, averaging less than three days, urban take longer to get programming to dentists, and depending on the reputation of the doctor can expect up to 10 days
- Work Programmer in the vast majority of dentists in urban areas is 8 or 9 to 20 the opportunity to stay overtime, which is accessible by dialing from any class dental treatment in rural exchange program is on average 6 hours per day, some only three days a week, with availability to be lower than the program, which makes it less accessible to the offices of dentists;
- the area is Timis county dental surgeons, Orthodontists, endodonțists,

doctors are implants, which covers all health problems that may occur in the mouth, but they are mainly in the county capital Timişoara Dent-alveolar surgery services and maxilla-facial surgery are generally provided by male doctors, which does not impede access to services for people with preconceived ideas, which operate not only allow male doctors and surgeons;

- most doctors in Timis county, he fits the treatment of patients according to their wishes and social status that have to do, trying as much as possible not to unpleasant patient.

CONCLUSION

Accessibility of dentists is Timis County is good in terms of: frequency of physicians per 100 000 inhabitants, both urban and rural, geographical coverage of dentists in the county of Timis, the availability of doctors and dentists to treat patients at any time, time spent by patients in the waiting room, passing time they call for an appointment and to get the doctor's office, the existence of all types of dental specialists in the county.

Accessibility is Timis County dentists in the following weak points: the majority of rural dental offices not have toilets for patients, the majority of county offices have shown prices in the waiting room, the majority have problems with technical equipments dental offices for disabled toilets; rural dentists are not equipped with ramp, most doctors are not willing to treat patients suffering from HIV, hepatitis B or C and who are willing to treat them do so only after the program. Can we talk about accessibility and urban poor, for certain categories of people who can not afford.

Concept paper reflects the interrelation of oral diseases, general health and overall processes of economic, social and cultural straitening also a new conception of the importance of health care services and social effort justifying it requires organization and accessibility. Oral-dental health education be one of the factors should not be neglected in both urban and rural areas. Accessibility to dental services, but the addressing is in a close relationship with educational level in general and health in particular, especially for the oro-dental care. Where accessibility is low, even if there addressability is high morbidity, the morbidity has high values. This is found in our rural area, where coverage with medical and dental units is poor compared to urban areas where we are confronted with a supersaturating of private dental practices.

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- In order to make a logical, chronological and didactical case report the following 5 chapters are needed:

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  III. Laboratory data;
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