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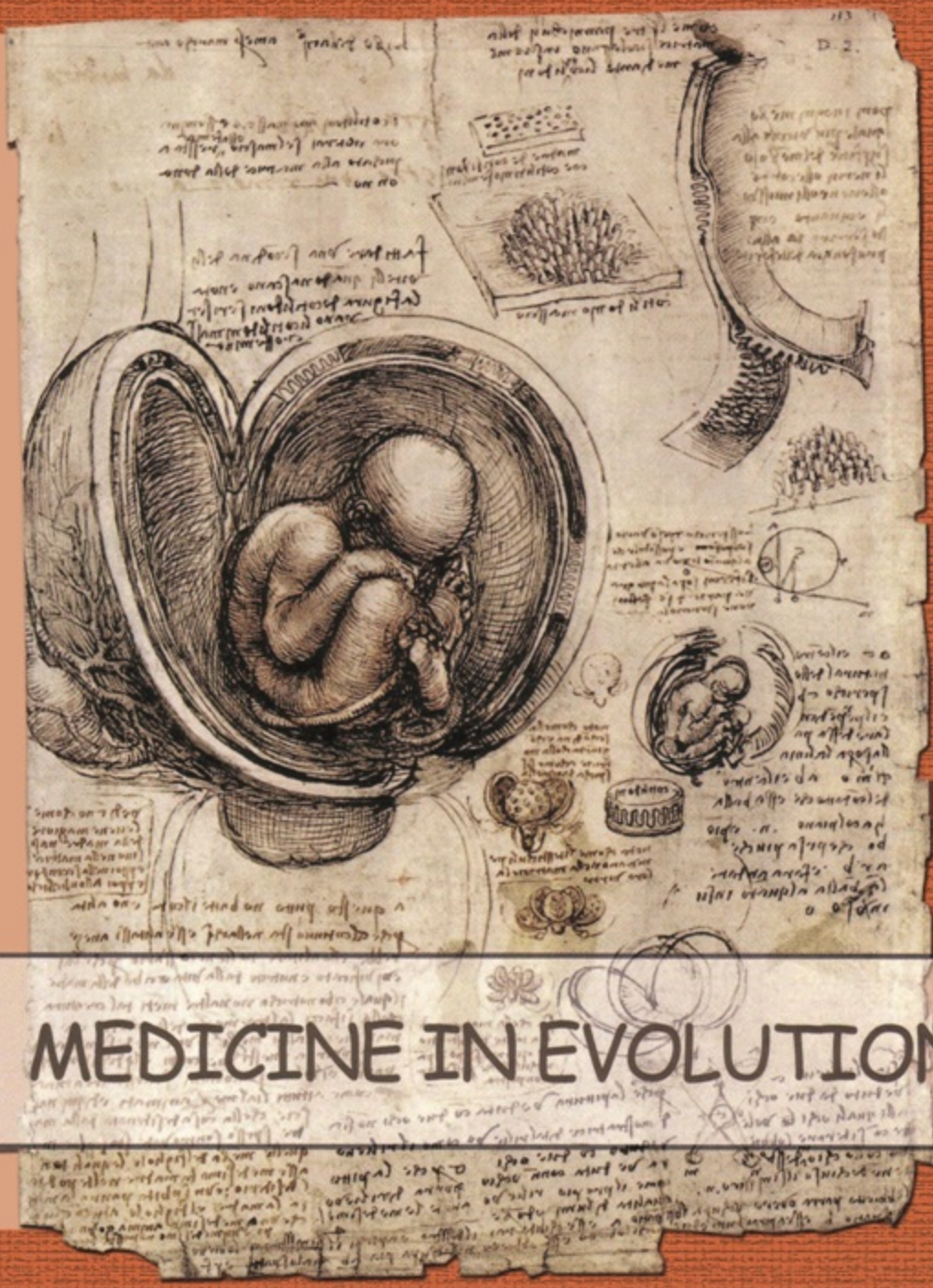

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IANUARIE 2012 | IULIE 2012 | IANUARIE 2013

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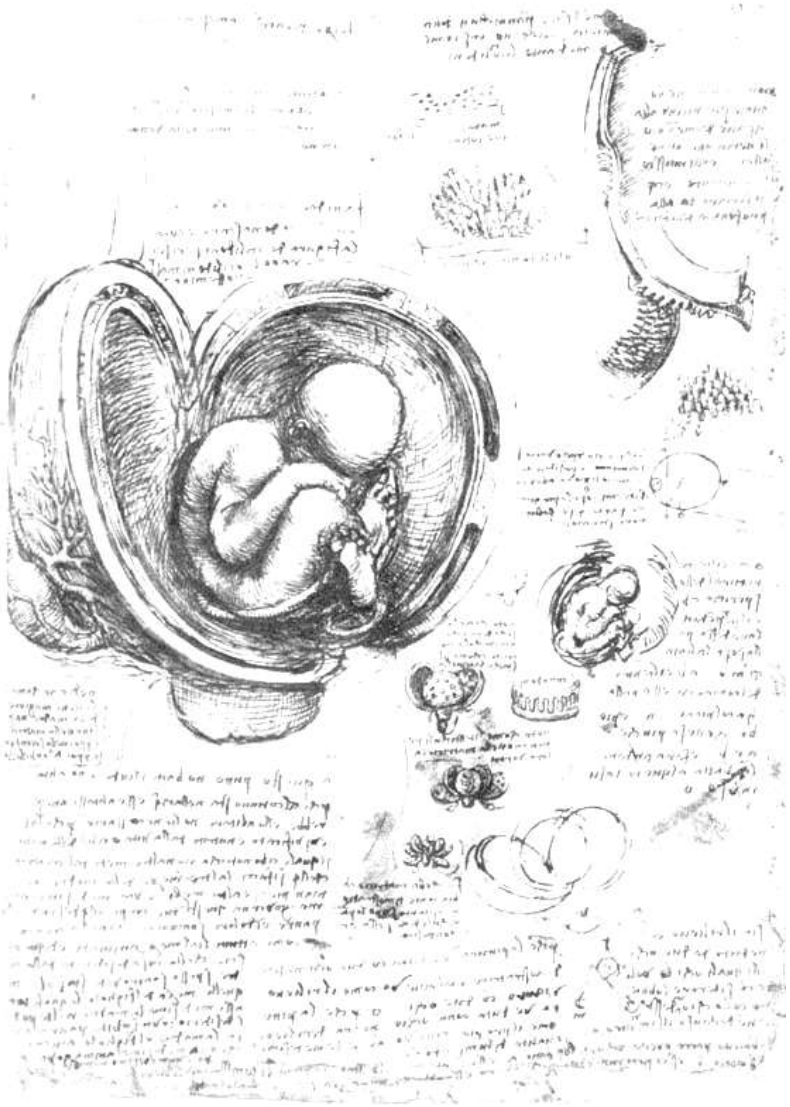

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Start: 2015/09/01
Finish: 2018/08/31
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- ✔ Mobility of dental hygienists and cross-border cooperation among stakeholders
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Sleep apnea and cardiac disease

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Abstract

Obstructive sleep apnea and cardiovascular disease have common risk factors and epidemiological studies show that sleep apnea increases the risk of cardiovascular disease regardless of demographic characteristics (ie age, gender and race) or risk indicators (ie smoking, alcohol, obesity, diabetes, dyslipidemia, atrial fibrillation and hypertension). Patients with severe sleep apnea are at increased risk for coronary heart disease, congestive heart failure and stroke. Mechanisms that explain the associations between obstructive sleep apnea and cardiovascular disease are not entirely delimited. Several intermediate mechanisms, including sustained sympathetic activation, intrathoracic pressure changes, and oxidative stress may be involved. Other abnormalities, such as clotting disorders, endothelial injury factors, platelets activation, and increased inflammatory mediators could also play a role in the pathogenesis of cardiovascular disease. The link between obstructive sleep apnea and cardiovascular disease is corroborated by evidence that treatment of sleep apnea with positive airway pressure reduces systolic blood pressure, improves left ventricular systolic function and diminishes platelet activation. Several systematic studies are needed to explain complex associations between sleep apnea and cardiovascular diseases, which may be aggravated by the involvement of metabolic syndrome diseases (ie central obesity, hypertension, diabetes and dyslipidemia). There are many studies that test the population based on testing causal patterns that bind sleep apnea, cardiovascular morbidity and metabolic syndrome are needed.

Keywords: obstructive apnea, cardiac disease, mortality, sleep apnea, sindrom Z.

INTRODUCTION'

Obstructive sleep apnea and cardiovascular disease have common risk factors, epidemiological studies show that sleep apnea increases the risk of cardiovascular disease regardless of demographic characteristics (i.e. age, gender and race) or risk indicators (i.e. smoking, alcohol, obesity, diabetes, dyslipidemia, atrial fibrillation and hypertension). Persons with severe sleep apnea are at increased risk of coronary heart disease, congestive heart failure and stroke. Mechanisms that explain the associations between obstructive sleep apnea and cardiovascular disease are not entirely delimited. Several intermediate mechanisms, including sustained sympathetic activation, intrathoracic pressure changes, and oxidative stress may be involved. Other abnormalities, such as clotting disorders, endothelial injury factors, platelets activation, and increased inflammatory mediators could also play a role in the pathogenesis of cardiovascular disease. The link between obstructive sleep apnea and cardiovascular disease is corroborated by evidence that treatment of sleep apnea with positive airway pressure reduces systolic blood pressure, improves left ventricular systolic function and diminishes platelet activation. [1]

Heart failure (HF) remains a major public health issue despite advances in the therapeutic field, being associated with increased morbidity and mortality, multiple hospitalization and, implicitly, very high economic costs. Therefore, it becomes increasingly important to identify and treat the factors or comorbidities that contribute to the progression of HF. Among the multiple comorbidities, breathing disorders during sleep, particularly sleep apnea syndrome (SAS), obstructive or central form, are associated with important pathophysiological changes:

- Changes in blood pressure: Repeated episodes of hypoxemia / hypercapnia due to apnea, followed by reoxygenation / hippocampus during recovery after apnea
- Large negative oscillations of intrathoracic pressure
- short weak-ups

These repeated nocturnal events will eventually lead to damage to cardiovascular structure and function, which are even more important in the presence of cardiac insufficiency. SAS is characterized by increased sympathetic activity at night, so patients with SAS and HF despite beta blocker treatment may not be sufficiently protected against this sympathetic activity and may be prone to night arrhythmias and even sudden death. [2]

PROPOSED MECHANISMS EXPLAINING LINK BETWEEN SLEEP APNEA AND CARDIOVASCULAR DISEASE

Mechanisms that explain the association between obstructive sleep apnea and cardiovascular disease are not fully understood, although several intermediate mechanisms are proposed. These include sustained sympathetic activation, changes in intrathoracic pressure, and oxidative stress and, consequently, vascular inflammation resulting from nocturnal hypoxic cycles and reoxygenation. Relationships between metabolic diseases including metabolic syndrome and sleep apnea. [3] Together, these diseases are called Z syndrome in the field of sleep medicine. Available epidemiological and clinical evidence suggests that all these conditions interact with each other through complex but non-differentiated pathophysiological pathways, thus increasing the risk for cardiovascular disease.[1]

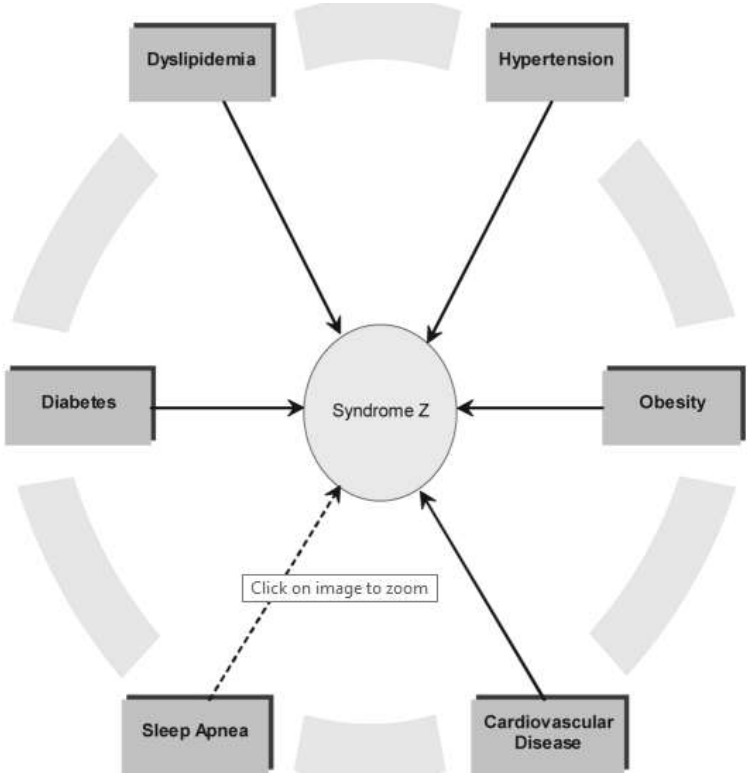

Figure 1. Relationships between metabolic diseases including metabolic syndrome and sleep apnea. [1]

Sleep apnea and cardiac disease Role of Diabetes

There is an increasing number of evidences suggesting that obstructive sleep apnea is involved in the pathogenesis of altered glucose metabolism. A series of epidemiological and experimental studies have shown that sleep apnea patients have increased glucose levels and increased insulin resistance, which may predispose people to developing type 2 diabetes. Cross-sectional data suggest that sleep apnea with higher glucose levels and increased insulin resistance may be independent of the presence of obesity. It is known that both obese and obese patients with sleep apnea are resistant to insulin, all patients with apnea are obese. In particular, the investigators proposed the following scenario probably. Sleep apnea causes an increase in sympathetic activity, and increased sympathetic activity prevents glucose homeostasis by improving glycogen breakdown and gluconeogenesis. [4]

Insulin was quantified using the IMMULITE 2000 immunoglobulin assay, a two-phase chemiluminescent enzyme-labeled immunoassay and the Immulite 2000 automated analyzer (Diagnostic Products Corporation, Los Angeles, CA, USA). Resistance to insulin resistance was assessed from glucose and insulin at birth using HOMA previously validated against the hyperinsulin eugli- cemic clamp.21

Sleep apnea and cardiac disease: Role of Dyslipidemia

Both factors involved in the development of dyslipidemia (i.e., elevated triglyceride levels and low-density lipoproteins) are affected by obesity, a common predictor of sleep apnea and cardiovascular morbidity. With increased adiposity, a proportional increase in triglyceride levels is observed, while the high-density lipoprotein level decreases. [5] Since most of the available evidence comes from transverse data, it remains a daunting task to determine directional causality. In this respect, it cannot be said that dyslipidemia produces sleep apnea or that sleep apnea causes dyslipidemia, although the two conditions tend to coalesce among patients with increased adiposity. Certainly, these associations could be seen in the context of data indicating a direct correlation between lipid profile and cortical arousal, often seen in sleep apnea patients. Patients with sleep apnea exhibit higher HDL dysfunction and oxidized LDL levels as compared to control subjects. [6, 7]

Cholesterol, triglycerides (Bayer Corporation, Tarrytown, NY, USA) and HDL cholesterol (Sigma Diagnostics, St. Louis, MO, USA) were measured after an overnight rest using an immunocoluritmic test on an ADVIA® 1650 chemistry system Corporation, Tarrytown, NY, USA). Low density lipoprotein (LDL) cholesterol was obtained using the Friedwald equation. [8]

Metabolic syndrome

The metabolic syndrome was diagnosed according to the guidelines of the National Cholesterol Education Program (NCEP). 2 Patients had a metabolic syndrome if they had three or more of the following risk factors: waist circumference > 102 cm, triglycerides ≥1.7 mmol / l, HDL cholesterol <1.04 mmol / l, blood pressure ≥30 / 85 mmHg and fasting glucose (6.1 mmol/l). [6]

Assessment of sleep diagnosis

All OSA subjects have snore and reported excessive daytime sleepiness or two or more other features of the condition: concentration deficiencies, non-reflex sleep, sleep choking episodes, apnea, restless sleep, irritability / personality change, and decreased libido. The OSA diagnosis was confirmed by polysomnography using the SleepLab 1000p system (Jaeger, Hoechlberg, Germany) with a standard electroencephalogram (EEG) mount, electro-oculogram and electromyographic signals, pulse oximetry, respiratory impedance and nasal air flow measurements. A limited study on respiratory sleep was performed at home in control subjects (Edentrace® II Plus, Nellcor Puritan Bennett ™, Eden Prairie, MN, USA) to rule out sleep disorder. This technique shows a strong correlation with polysomnography (CDI, r = 0.96 18) 18 and was previously validated for home diagnosis of OSA. [9, 10]

Sleep studies were analyzed by two technicians using computer software. Apnea was classified as an airflow interruption for at least 10 seconds, accompanied by a 4% desaturation in the next 30 seconds. Hypopnea was defined as a 50% reduction in airflow, accompanied by 4% desaturation and a reduction in the movement of the thoracic wall. Data were expressed as respiratory disturbance index (RDI) based on the average number of episodes of apnea and hypopnea per sleeping (polysomnography) or hourly in bed (home study). [11, 12, 13,14] Domestic studies were considered acceptable only if the subject reported a satisfactory night's sleep during the test.

Sleep apnea and cardiovascular diseases: The role of hypertension

One of the complexities that come into the relationship between sleep apnea and cardiovascular disease refers to the fact that both symptoms seem to arise from similar pathogenetic mechanisms. In fact, both sleep apnea and cardiovascular disease are related to hypertension. [15] The results of several multivariate analytical models have shown that sleep apnea is an independent risk factor for hypertension, and hypertension is a significant predictor of cardiopulmonary death in patients with sleep apnea. [16, 17, 18, 19]

CONCLUSIONS

OSA is independently related with an increase in the cardiovascular risk factors, that comprise the metabolic syndrome and its overall prevalence. This can explain the increased cardiovascular morbidity and mortality associated with OSA.

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Sociological study on knowledge level of high school students about contraception

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Abstract

Introduction: According to today's perception with regards that in Romania, 170 women per dayrequest abortion by demand of which most of them are high school students or high school graduates, we studied the level of knowledge about contraception and the practical use of it.

Methodology: A cross-sectional study was run, using a questionnaire designed by the Department of Sociology (Faculty of Sociology and Psychology of the West University of Timisoara) answered by 800 high school students. The questionnaire contains 50 questions divided into three main categories: 1. Contraception, 2. Abortions and 3. Facts.

Results: The average age of sexual life onset was 16 years, 6 months and 2 days. It should be noted that 40.12% of students are alcohol-consuming and 49.67% are smokers. None are usingforbidden-by-law drugs. We mention that 63.75% of students declare that they have sufficient notions about contraception and 62.93% of them started their sexual life. Of the contraceptive methods used, the condom (73.76%) is by far the most used, followed by coitus interruptus (11.02%) and the contraceptive pill (10.64%).

Keywords: education, contraception, abortion

INTRODUCTION

According to today's perception with regards that in Romania, 170 women per dayrequest abortion by demand of which most of them are high school students or high school graduates, we studied the level of knowledge about contraception and the practical use of it.

In case of an unwanted pregnancy occured during high school, the student usually abandons the school, starts a sort of self-destruction, is dependent on others and she often does not have a stable family. (1,2,3)

The family abandonment or rejection of a pregnant student that has a physiological state requiring a special care often leads to the development of a labile psychic state that can sometimes push her into undesirable gestures. (1,4,8,11,23)

If, however, such an accident occurs, parents and especially the mother must be the first to help her overcome the moment. (17,19,30)

Solving seems to arise by using abortion on demand because the occurrence of a pregnancy in a high school student changes the relationship with society, parents, friends and essentially changing the nature of adolescence. (6,15,30)

If, however, the baby is born, most families are balanced and if the child is not raised by the family, it is given up for adoption or given up to specialized state institutions by abandoning it in maternity. (16)

Preparing young girls for sexual life and family life must be done at home by parents. Almost all sexual education publications reveal the obligation of parents to participate in the sexual education of their children, although in everyday life they mostly do not. (7,8,10,14)

Contraception is one of the most popular methods of family planning and is a deliberate prevention of conception by using a method or a contraceptive product. (8,11,24,26)

The situation is not specific to Romania, as it may appear anywhere in the world. Of course, there is a lower or higher rate of abortion per 1,000 women, depending on the continent, country, region. The evolution of this indicator between 1990 and 2014 was as follows:

Table I. Estimated rate of abortion / 1000 women, by regions in 1990-2014 and time period (11)

	1990 – 1994	1995 – 1999	2000 – 2004	2005 – 2009	2010 - 2014
Worldwide	40	37	35	34	35
Developedcountries	46	40	34	31	27
Developingcountries	39	36	35	35	37
Eastern Europe	88	75	61	51	42
Northern Europe	22	20	19	19	18
Southern Europe	38	34	29	27	26
Western Europe	13	13	15	18	18
North America	25	22	20	19	17
Africa	33	33	33	33	34

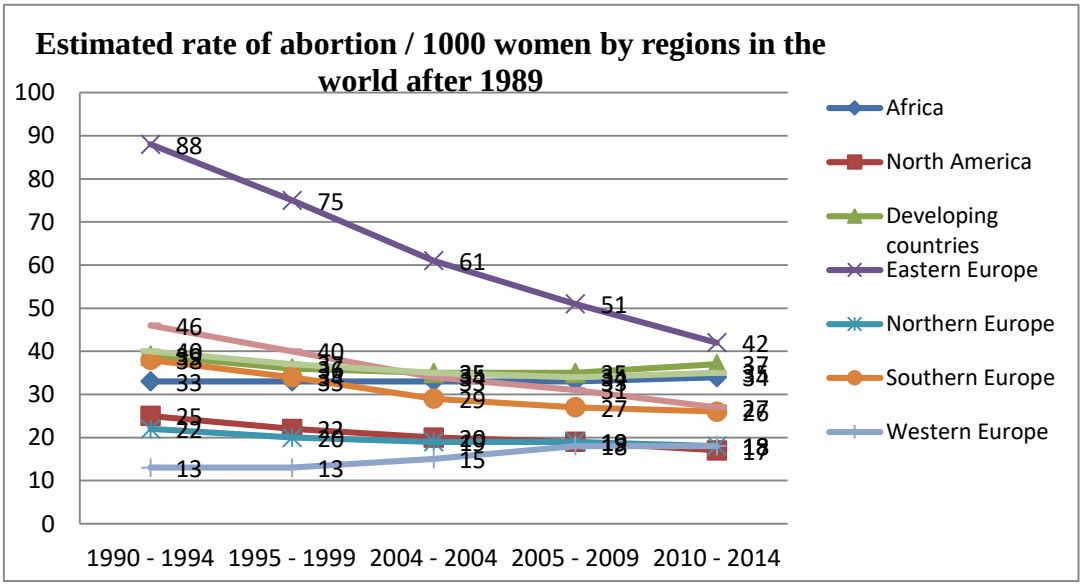

Figure 1. Estimated rate of abortion / 1000 women by regions in the world after 1989

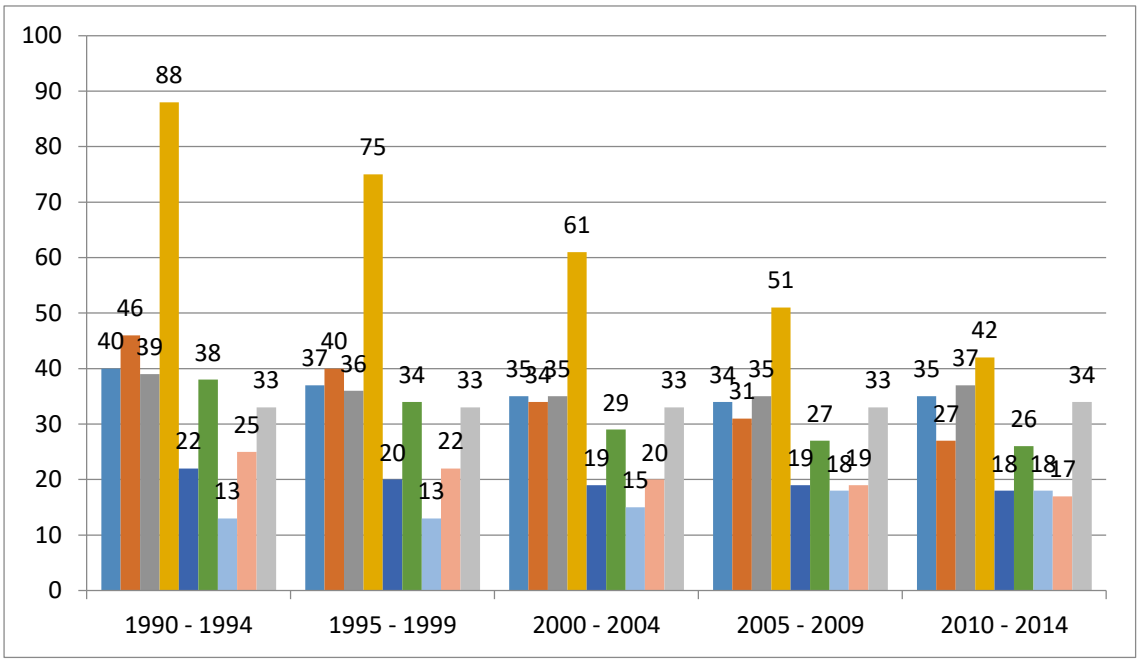

Figure 2. Estimated rate of abortion / 1000 women by regions in the world after 1989

In Romania, the abortion rate per 1,000 women is permanently decreasing from 177.6 in 1990 to 23.5 in 2008.

Table II. Abortion rate in women in Romania after 1989 (11)

Year	Number of Abortions	Report on 1000 women
1990	899,654	177,6
1992	691,863	142,2
1994	530,191	93,2
1996	455,340	78,6
2000	257,267	44,3
2004	189,683	33,8
2008	127,410	23,5
2010	101,271	
2014	78371	

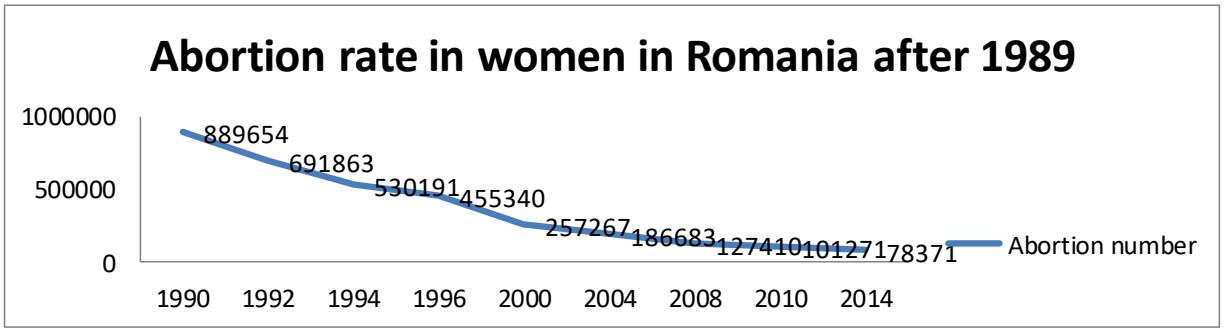

Figure 3. Female abortion rate in Romania after 1989

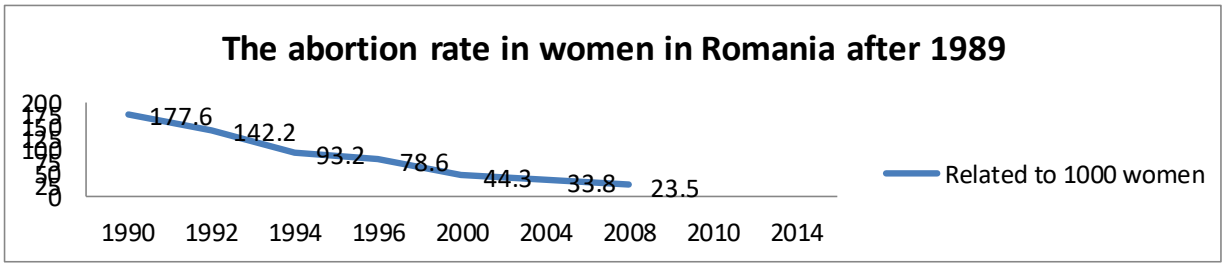

Figure 4. Estimated rate of abortion / 1000 women in Romania after 1989

The reasons why women demandthe abortion are varied, the most important being related to social status or age. Often, the influence of partner's family members representsan important factor for taking into consideration end the pregnancy.

METHODS

In order to see knowledge level of high school students regarding the contraception, we proceeded to a cross-sectional case study which consisted of answering a questionnaire, with the support of the Department of Sociology (Faculty of Sociology and Psychology of the West University of Timisoara), where we used questions from some forms accepted by the European Contraception Society such as:

- International Personality Item Pool-50 questionnaire (IPIP 5e);
- UCLA 3 (UCLA 3) Loneliness Measurement Scale;
- the revised Inventory of Sexual Orientation (SOI-R).

The questionnaire contains 50 questions, divided into three main categories:

1. Contraceptive methods
2. Abortion data
3. Facts

The study aim is summarized in the first part of the questionnaire and is dedicated to contraceptives and a part of demographic data. In the contraceptive part, there are questions about the perception use of contraceptives (acceptability and information about contraceptive methods). The headings containing factual data provide information about the age of the patients, ethnicity, the urban/rural settlemen, education level.

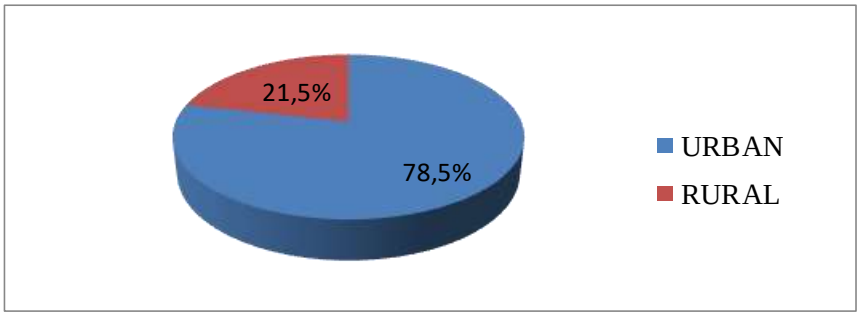

Figure 5. The lot studied by the urban/rural settelment

After the respondents' age, the group is divided between 13 and 18 years old. The average age is 16 years, 2 months and 1 day.

Table III. representing the age of the studied group

AGE	13		14		15		16		17		18		TOTAL	
	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%	Nr.	%
	56	7	76	9,5	138	17,25	158	19,75	126	15,75	256	30,75	800	100

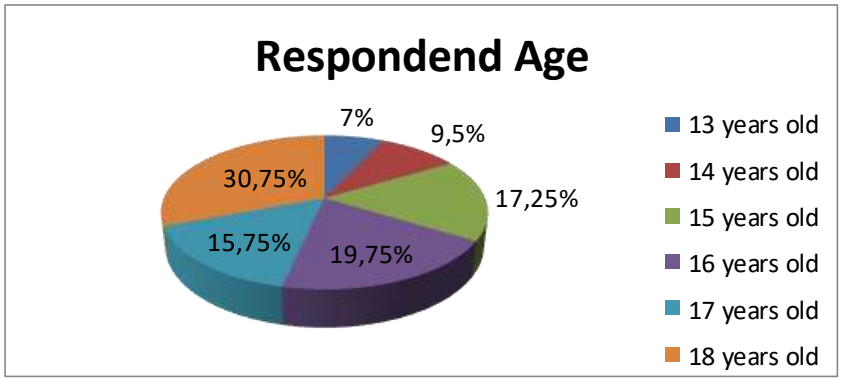

Figure 6. The age structure of the studied lot

According to nationality, most respondents were of Romanian nationality 723 (90.37%), Hungarian 24 (3%), German 19 (2.37%), Roma 20 (2.5%) and other nationalities 14 (1.75%).

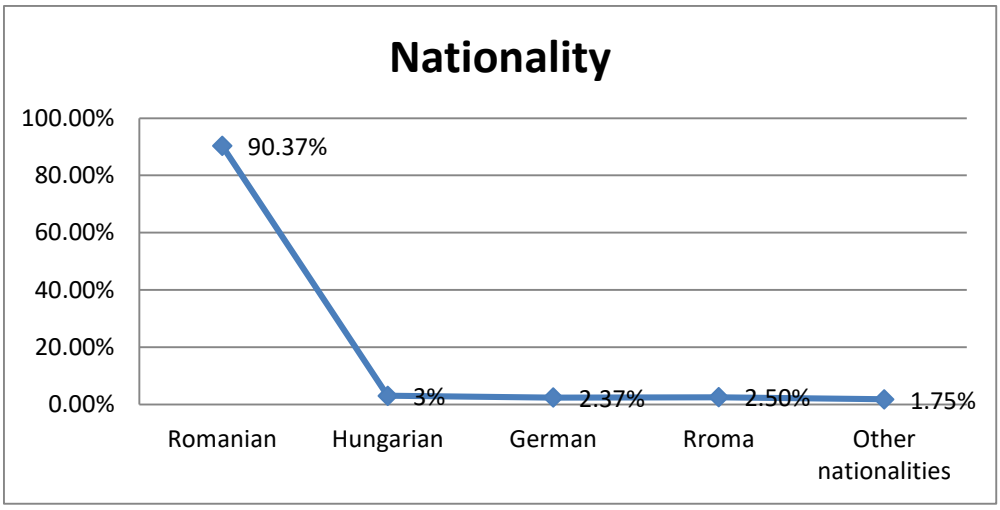

Figure 7. The structure of the lot by nationality

It is worth mentioning that 402 (50.25%) of the investigated high school girls started their sexual life, compared to 398 (49.75%) who did not start their sexual life, these answers remaining under the sign of subjectivity due to doubts about the sincerity of the answers.

Table IV. Represents the age group studied by age of sexual intercourse

AGE	13	14	15	16	17	18	TOTAL
Nr.	2	5	57	108	132	98	402
%	0,49	1,24	14,17	26,86	32,83	24,37	99,96

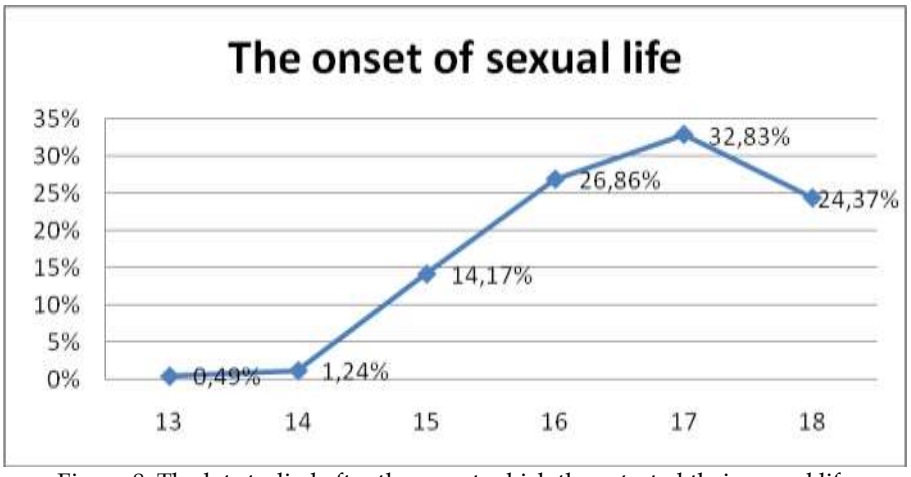

Figure 8. The lot studied after the age at which they started their sexual life

The average age of sexual life onset in the studied group is 16 years, 6 months and 2 days.

A special curiosity for the studied group was the alcohol consumption results, 321 (40.12%) claiming they are regular alcohol users and only 479 (59.88%) do not consume alcohol, as opposed to the percentages obtained for smoking, which for us are not surprising - 397 (49.62%) being smokers and 403 (50.38%) are not smokers. Under the suspicion of insincerity, none of them declared using forbidden-by-law drugs.

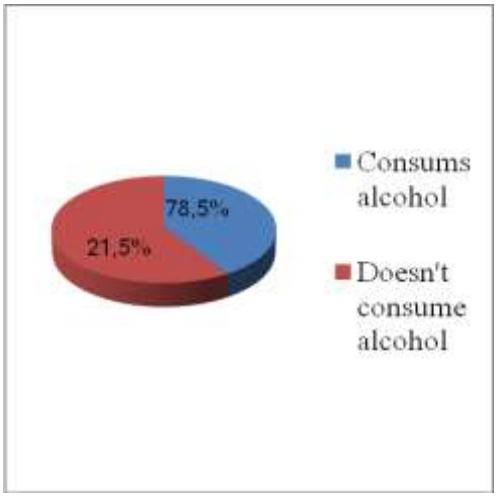

Figure 9. The studied lot by alcohol consumption

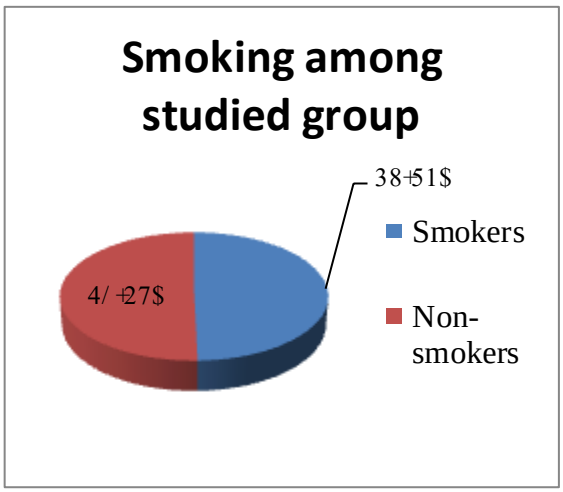

Figure 10. Smoking among studied group

Out of 800 students consulted, unfortunately only 296 (37%) practice sports, many of them not participating sports classes, being medically exempted.

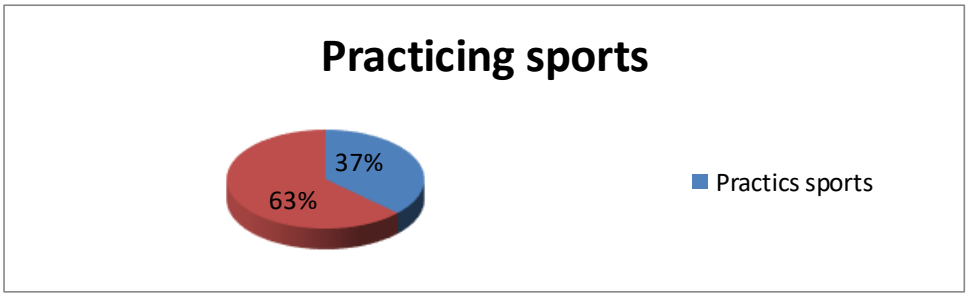

Figure 11. The studied lot according to the practice of sports

Regarding contraception, over 50% say they have enough concepts about contraception, namely 510 (63.75%) compared to 290 (36.25%) who admit they have no concepts about contraception. Of the 402 high school students who started their sex life 253 (62.93%) practice contraception and 149 (37.07%) do not practice contraception.

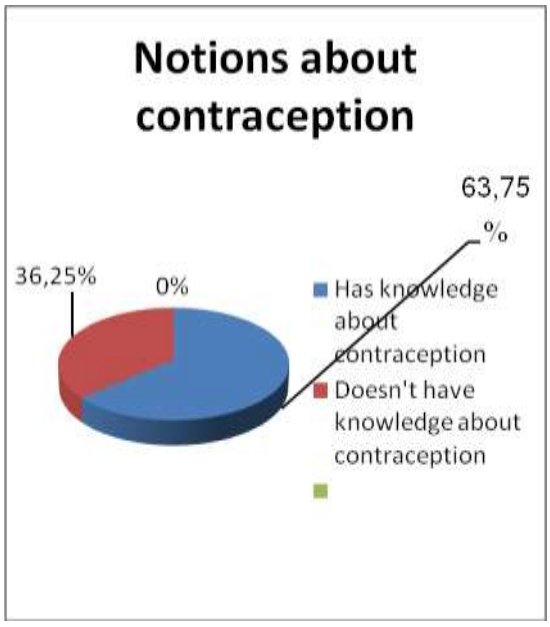

Figure 12. The proportion of the studied lot according to the concepts of contraception

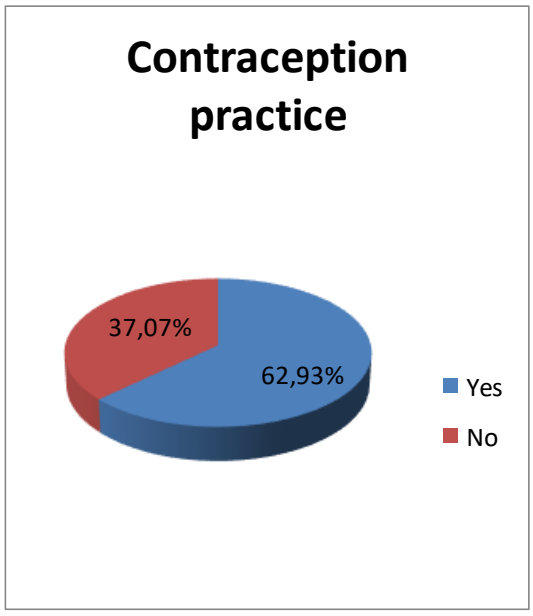

Figure 13. Lot depending on whether or not contraception is taking place

The questionnaire was completed by 800 high school students, being informed that their answers are under the protection of anonymity.

According to the urban/rural settlement, 628 (78.5%) come from the urban settlement and 172 (21.5%) from the rural settlement, due to the fact that the study was run in high schools from Timisoara and Lugoj, where students from rural settlement also studied.

As far as the teaching of contraception is concerned, the 510 cases of students who said they were informed, said that these notions are received from:

Table VI. _____

1	**Parents (mother)**	132	25,88%
2	**Doctors or nurses**	99	19,41%
3	**Partner, friends**	66	12,94%
4	**TV/Mass Media**	52	10,11%
5	**Internet**	117	22,94%
6	**School**	44	8,62%
7	**TOTAL**	510	99,98%

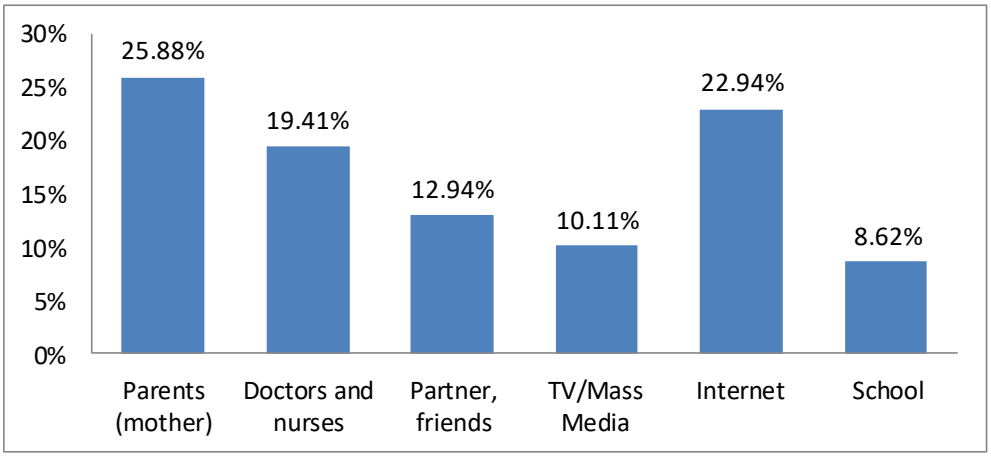

Figure 15. Source of information on contraceptive notions

According to the study, 12 (4.56%) cases of emergency pill contraception were performed, although the whole lot showed that 371 cases had 46.38% knowledge of emergency contraception compared to 429 (53.62%). cases that have no idea about this process.

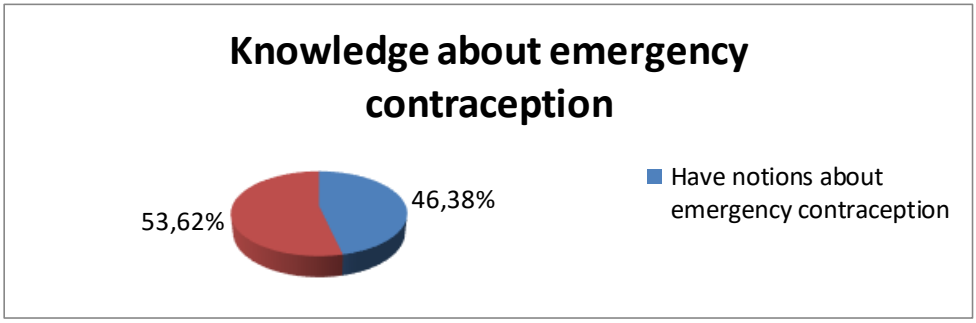

Figure 16. The lot studied according to the concepts of emergency contraception

In the chapter on abortion, 663 (82.87%) of the respondents consider abortion to be a sin against 137 (17.13%) who, from a religious point of view, do not consider it a violation of religious perceptions or the one who is subject to the practice.

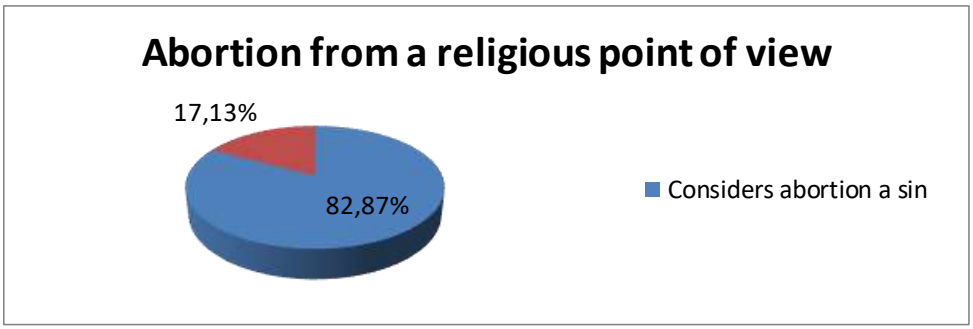

Figure 17. Abortion from a religious point of view

Contrary to religious perceptions, in the case of an unwanted pregnancy 624 (78%) would resort to abortion and only 176 (22%) would be born.

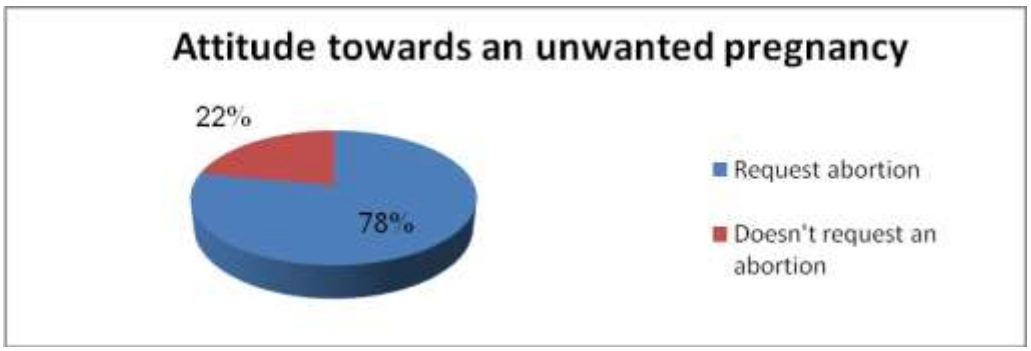

Figure 18. Attitude towards an accidental task

Although 474 (59.25%) are aware of the risks of an abortion on demand versus 326 (40.75%) who do not know these risks, 563 of the respondents (70.37%) would take responsibility for taking an uterine curettage versus 237 (29.63%) who would not take this risk.

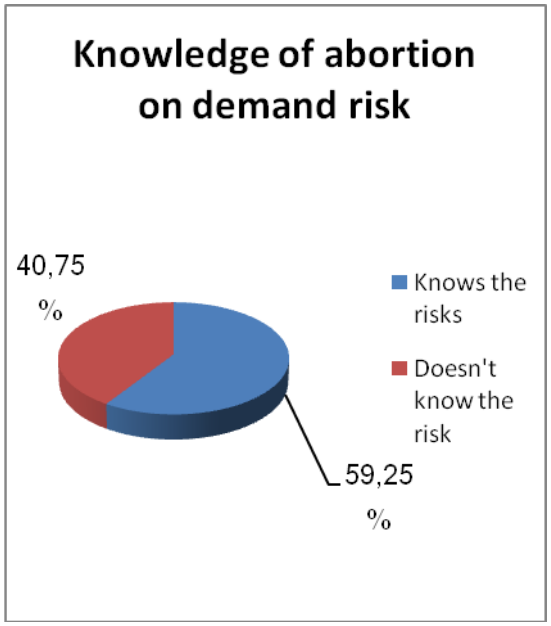

Figure 19. Proportion of knowledge of abortion

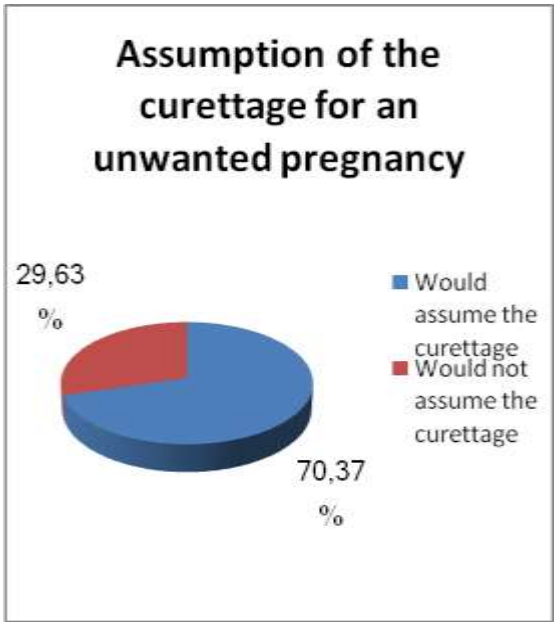

Figure 20. Percentage of assuming an risk on demandabortion in an accidental pregnancy

Regarding the attitude of the students to the abortion on request 281 (35,13%), they are of the opinion that they should be banned and 519 (64,87%) agree to be free and on demand.

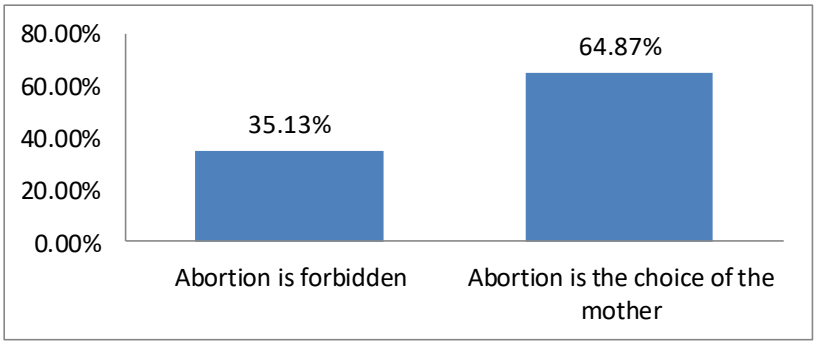

Figure 21. Ascending attitudes to abortion on demand

This view is in line with the attitude of the students towards the abortion resolution of an accidental pregnancy.

Statistical analysis

The data for each question was entered in the Microsoft Excel 2019 program, thus forming a database that represented the statistical processing work.

In the same program, the tables and graphs were displayed in the results section, after which the information was imported into the SPSS program, where the data was processed from a comparative and correlative point of view.

The numeric collected data were presented using the frequency and percentage. The significance of the groups' differences was evaluated by applying the t-student (comparisons between the averages), the Kruskal-Wallistest (nonparametric test for mean comparison) or the Mann-Whitney U test (median comparison) or the Fisher test. The association of ordinal-type variables was evaluated by calculating the correlation coefficient Sperman r. We considered the value of 0.05 as the threshold of statistical significance.

CONCLUSIONS

1. The onset of sexual life among high school students has fallen in the last 25 years, being favorized by the state political freedom, as well as by the development and access to information.

2. Most frequently, the onset of sexual life among high school students takes place between 16-17 years in a proportion of 59.69%, the mean age being 16 years, 6 months and 2 days.

3. It should be noted that 63, 75% of respondents have a basic knowledge about contraception, 62.93% being users of a contraceptive method.

4. Among the contraceptive methods, the use of condom is the most popular method (73.76%).

5. Most concepts about contraception are received from parents in the proportion of 25.88% and from the Internet (22.94%).

6. However, 82.87% consider the abortion a sin, 78% of the respondents would request an abortion in case of an unwanted pregnancy, although 59.25% of them are aware of the risks of abortion.

7. With all the existing consensus on sex education, two things must be solved: the way of approaching it and the age at which this education should begin.

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Ethical concepts and legislation in medical imagistics

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Abstract

Patients and their families should take away the risks and benefits of imaging so that they can best understand the information and use it to make informed choices. If they are not adequately informed about the risks and benefits of an imaging procedure, they can make choices that are not beneficial and even harmful (for example, to refuse a CT or to request a CT that is not justified. Communication is also important among medical team members. Effective communication between referrals and members of the imaging team may prevent inappropriate referral. By enabling informed decision making, effective communication of radiation risk helps ensure the greatest possible benefit of imaging in dental medicine with the lowest possible risk.

The advertising in medical services, in increasing, and that create risks, that justify new standards for advertising when considered as part of the moral obligation of health care institutions and suggest that mechanisms currently in place to regulate advertising for radiological investigations, because using in excess could cause a lot of risks, for health at patients, for doctors for radiation exposure and time consuming to combat the irrelevant investigations.

Keywords: medical ethics, ethical concepts, medical Imagistics, medical advertising

INTRODUCTION

Radiation is a key component of a radiation protection program in the health sector. Awareness of health professionals about radiation doses and risks associated with medical imaging may be low. Clinical doctors need a fundamental fund, education and resources to communicate clearly and effectively about the benefits and risks of dental imaging procedures. Responding to this need, the World Health Organization (WHO) has launched a project on communicating, on the risk of radiation in dental imaging. The OMS convened an international seminar on communicating with radiation in pediatric imaging in September 2010. This meeting was held at the WHO headquarters in Geneva (Switzerland) and brought together 35 participants from 23 professional societies, international and regional organizations and UN agencies. [1] Including representatives of key stakeholders in the field of dysthymic imaging, such as radiologists, technicians, medical physicians, doctors, nurses, patients and parents, regulators, communicators and communication experts. The Group has developed existing guidelines and tools to communicate radiation risks in diagnostic imaging, identified gaps and agreed on the need to support the risk-benefit dialogue in imaging. It has been proposed to develop an educational tool for health service providers with guidance on how to effectively communicate radiation risks related to radiological medical procedures in children [2] to different target audiences. It has also been proposed to provide more concise information for patients and their families.

Using Radiation in Imaging Life Lives - The clinical value of images involving the use of radiation to diagnose pediatric diseases is incontrovertible. However, inappropriate or unqualified use of such technologies may lead to unnecessary exposures that may increase the risk and cannot provide additional benefit to adult and pediatric patients. While the radiation dose administered during diagnostic procedures is low and cannot be expected to cause acute lesions, the imagistic pot guided interventional procedures provide doses large enough to cause important effects such as skin lesions. Risks are a concern in the pediatric imagery, as children are more vulnerable than adults to the development of certain types of cancer. While individual radiation risks are low, increasing radiation safety in pediatric imaging has become a public health issue due to increasing exposure of the population as well as public awareness and often alarming to the public. The benefits of child imaging must be weighed against potential exposure to radiation. The goal is for the cabinet to overcome the negative effects. This requires policies and actions to recognize and maximize the multiple health benefits that can be achieved, while reducing the potential health risks. This can be achieved by implementing the two principles of

Protect against medical resistance: justify procedures and optimize protection, summed up as "doing the right procedure." The existing imaging recommendation guidelines can be used to support justification and to increase the timeliness of referral. These decision support tools can inform practitioners and radiologists, along with patients or caregivers, to choose the appropriate exam. As far as radiation protection is concerned, optimization means maintaining "just as reasonably low" doses (ALARA). For medical imaging, ALARA means providing the most necessary micoidoses needed to obtain adequate diagnostic data for diagnosis. There are multiple opportunities to reduce the radiation dose without significant loss of diagnostic information.

Medical service providers that request and perform imaging-radiological procedures in both adults and children have a shared responsibility to accurately and effectively communicate the radiation rays to patients, parents and other caregivers. They should be able to conduct risk-benefit discussions to inform decision-makers and radiologists, medical physicists and other members of the imaging team should be able to carry out risk-benefit

discussions with their colleagues, pediatricians, physicians, pediatricians, family doctors, emergency physicians and other physicians.

Awareness among healthcare professionals about radiation doses and risks associated with imaging medicine may still be low. It is important to communicate that risks can be controlled and maximized benefits by selecting an appropriate procedure and using methods to reduce patient exposure without reduce clinical efficacy. Although the fundamentals of risk communication and risk-benefit dialogue are common to all health care institutions, the implementation of an effective communication strategy in the field of imagistic imaging often requires unique considerations.

Aim and objectives

This paper aims to assess the knowledge of dentists and patients on the risks of investigations repeated radiology and the opportunity to recommend them. The work also discusses the ethical issues related to communicating radiation risks in dental imaging. Also discussed were the concepts and principles of radiation protection, how they are applied in adult and child's imagery and factors Key Issues for Establishing and Maintaining Uniculous Radiation in Health to Improve Practice - a Pillar of Radiation Protection in Copper dinner.

THE MEDICAL, SOCIAL AND LEGAL BACKGROUND FOR RADIOLOGY

The defining feature of medicine has lately been its huge scientific and technological success, along with an iconic repositioning in public consciousness. This has been accompanied by an increase in expectations from hospitals and medical institutions at an unrealistic level and putting undue pressure on the health system and those working in the system. This, inevitably, creates public disappointment and public anger when expectations are not met. [3, 4] The model of provision of medical services continues to have strong paternalistic inclinations. Health professions have often failed to recognize growth in recognizing individual autonomy. Consumer culture, transparency and accountability are dominant influences in the way transactions are expected to take place. Failures in these areas have led to the mistrust of the healthcare professionals. Examples of failures are found in the history of various medical surveys, such as problems with blood products, infant organ retention problems, and more. Investigating reports often suggest that contributing factors include both paternalism and desensitization of professions to public concerns. [3, 4] There have been profound social changes since the current ICRP radiation protection system was established in 2006. A short list Areas where this is observed include: euthanasia, assisted suicide, marriage, divorce, single parents, disability, authority, professions, the right to life and the autonomy of the individual. In many cases, changes are reflected in the law, social policy and practices of society, including medicine. However, radiology was a reluctant participant in these developments. [4, 5, 6] There is also evidence of a changing pattern of access to hospitals, sometimes on almost a consumer base, such as tourism medical. Medical tourism is encouraged by some governments, industry and professions. In radiology, the widespread growth of commercial imaging clinics is widespread; the feeling among the "clients" of these clinics might be that if they want an examination, they should be allowed to have it. This feeling is encouraged by promotional sites and brochures. Because of this, there are now two types of referrals or presentations of patients who do not traditionally meet in radiology: self-presentation and self-referral. We speak of self-presentation when the patient asks for a radiological and self-referral service when a doctor (for example, a dental practitioner) who has radiological facilities at his own clinic can perform a procedure on a patient instead of referring to a third party

Another part, such as a radiologist. Both have the tendency to increase the use of ionizing radiation in addition to the one prevailing in the traditional approach [16,33,46]. In practice, the service provider may inappropriately or otherwise be deviated from its focus, is the welfare of the recipient. In particular, the financial interest in maximizing the use of a clinic's resources may interfere with an objective risk-benefit assessment. When a physician has such a financial interest, it must be disclosed to the patient. [7] In addition, if the procedure cannot be medically justified, the patient should be informed. The predominant social environment has increased the level of openness, accountability and transparency expected by professionals and institutions. Also, the way medical imaging centers are organized can make individual responsibility difficult. In larger institutions, the imaging departments can be a large enterprise, with several hundreds of employees performing between 500 and 1000 examinations per day, possibly several hundreds of thousands per year. This is radiology on an industrial scale, and the management skills are not always available. The welfare of the individual patient can be lost in such large systems. Financing arrangements, both in public and private systems, can make it more difficult for radiologists to refuse inappropriate referrals.

SUPRAUTILATION OF MEDICAL IMAGISTIC SERVICES

The concern about overuse of medical imaging services is now well established in the assessment of medical technologies (HTA). The economic cost and loss of benefits for those who really need services have been well articulated during the debate reform of American health. [5,6,8,9] There have been several initiatives of the radiological community that respond to these pressures as well as public concerns about the radiation doses. These include IMAGE GENTLY and 12IMAGE WISELY, which mainly applies to children and adults. [10] In parallel with these, specialists and surgeons examined their models of prescription diagnostic tests and treatments, and had a known campaign known as CHOOSE WISELY. Data from Japanese atomic bomb survivors continue to be the best epidemiological source for the relationship between the risk of cancer attributable to radiation and the dose of radiation. The problem at low doses, such as diagnostic examinations, is that because of a lack of direct evidence, estimates are derived from the extrapolation of the dose effect curve, linearly, from higher doses. However, the current radiation dose is low at approximately 35 mSv (2-3 CT scans). Since it is not possible to select between competing models for this relationship, the authorities conclude that a linear threshold less model remains a conservative choice for calculating risks at low radiation doses. [11, 12, 13, 14] Recently, new data were found on cardiovascular effects and other non-cancerous long-term effects due to radiation. Many radiologists, cardiologists, etc. are skeptical about radiation damage and believe that there is no conclusive evidence of damage. This is not logical and, moreover, is incompatible with the precautionary principle. Thus, they do not advise patients about the risk, they are skeptical and generally do not take it into account. In this context, a 2011 AAPM statement [5] is to be regarded as unbalanced, incompatible with the precautionary principle. Indeed, Shah et al. they took the position of the AAPM as an example of the precautionary principle, namely the benefits are highlighted without reference to the risks. [12] The message should be that there may or may not be a risk. Radiological scanning is therefore necessary in serious or life-threatening situations, preferably with the patient's consent after counseling on the various risk issues. [11,3,8,9,15, 16] The ethical issue is even more profound if the examination is inadequate. Such practices are a source of societal, patient and medical practice. It has been suggested to use and keep binding consent forms, especially for higher-dose radiation examinations. It can promote patient understanding and reminds the physician of his responsibilities. [3] A joint IAEA-EC workshop acknowledged that successive approaches to communicating radiation risks to different groups, including patients, practitioners, surgeons,

radiologists and other professionals, did not were also effective. [11] In addition, it identified the need to discover and differentiate the communication tasks faced by the professions involved in order to enable the development of new programs. [11, 3]

The importance of a more effective approach in this regard has been given by recent communication and debate in both the literature and the public press [11, 3, 17]. Thus, the current situation in radiology is that communication is incomplete and/ or unsuccessful. Simple questions in fact are not passed on in an efficient and sustainable way to those who need to be aware and trust. [16,17,18] This situation, inevitably and over time, can undermine the social acceptability of current practice and needs to be fixed. Finally, it is well recognized that the communication of accurate information, even if it is essential, does not fully address the issues involved. Failure to do so leads to social amplification of risk. It is important to participate in the social context and the emotional response as well as the empirical content of the message. [3] In addition, we must not lose sight of radiation protection, which makes these tasks even more difficult. Extending the use Radiology has become a concern for several reasons, including the population dose, the individual dose, the financial economy. The focus is mainly on justification, a cornerstone of the ICRP system of protection, especially in the absence of dose limits for patients. [7, 3,14,7] The justification for exposure of individuals to radiation consists in the fact that medical exposures are used to help the patient and the justification process ensures that the patient's benefits outweigh substantially any short- or long-term risks. Thus, the key to the effective implementation of Radiation justification is that to disregard those patients are undergoes an examination of the need for it. [13,3] Justification is, in most countries, part of the legal system. However, the impact of regulators on implementation has been limited, at best, because the areas involved are the competence of health professionals [18,19, 20]. A joint IAEA-EC workshop with the participation of 40 countries and the workshop that "there is a significant and systemic practice of inappropriate examination in radiology". Some steps such as: Improving the effectiveness of communicating with patients, the public, doctors, surgeons, radiologists and radiation risk specialists, ensuring that those undergoing radiological examinations need them and the clinical relevance of the referral process and related processes. The IAEA proposes a way forward based on a global campaign to respect them [11, 3]. It was generally well received and adopted more formally by the American Competent Authorities (HEADS) or the European Radiological Protection Authorities (HERCA) and the Nordic radiation protection authorities.

Awareness of the data published in recent years has found that physicians in the health field generally have insufficient knowledge of radiation doses involved in medical imaging and consistently underestimate them. [10,3,18,23,29,31,4, 18,22,23] The results of investigations by British, Orthopedic, Cardiologists, Italian, Brazilian and Australian, pediatrician and Turkish cardiologists, radiologists show that most doctors seriously underestimate radiation doses and risks for the most common procedures required. From the published data, it is reasonable to deduce that the problem is global and applied to the physicians, whether they have attended special courses. Regarding patient awareness, there is a limited number of studies showing that they are poorly informed about radiation risks, often due to a lack of awareness among the doctors who rely on such information. [11] An awareness campaign that provides a fluent knowledge of radiation dose and risk is essential. This campaign deals with the special issues faced by radioprotection professionals in terms of current transparency requirements. [10] This will not only help justify the campaign, which is essentially ethical, which will also positively influence the health and HTA indicators. [6,7,22] Most countries are trying to establish transparent and tangible procedures for managing the quality of health services. A key element to this is clinical audit. This, although widely applied to many health care practices and required by EC Directive 97/43 / Euratom on radiation protection for the patient, has found its place in radiology. [19] To help States

implement these requirements, the EC has developed guidelines on clinical radiology auditing. The approach is flexible and allows Member States to adopt a form of clinical audit in accordance with national provisions. Useful tips and practical prescriptions are available from the IAEA, the EC and the Royal College of Radiologists [11,20, 21]. Justification is a cornerstone of radiation protection and should be among the top priorities of the audit program. 16] Several factors contribute to the overuse of medical imaging services. These include the lack of awareness mentioned by doctors and practitioners already mentioned. This may result from inadequate training. It may also include insufficient knowledge of patient presentation, abandoning clinical examination for images, duplication of examinations already undertaken, inappropriate knowledge, experience and confidence

In balancing the benefits of the procedure or alternatives, variations in practice based on local preference than the evidence and pressure or expectation of patients to carry out unnecessary screening. "Defensive medicine" gives rise to imaging, the purpose of which is to protect the physician rather than to bring a benefit to the patient, and this is also a problem. [11,5,43,4,25] There is evidence of increasing self- -section, in which referring physicians have a financial interest in the imaging arrangements. Increasingly, imaging services are marketed directly to the public and this is reflected in a growing popularity for medical tourism. Population screening is an established approach to public health, but if it involves radiation, it must be justified in terms of both public health and radiation protection. Finally, the increased number of patients like an industrial-commercial activity, imaging departments may also be a factor. [11]

NON-MEDICAL AND MEDICAL EXPOSURES

Medical outcomes generally provide benefits to exposed persons and are conducted under the supervision of physicians who are trained and authorized to do so. However, there are non-medical exposures such as security, crime prevention, immigration and immigration, smuggling detection and litigation. These are different and require extra attention. [11,20,22] As the difference between the two types of exposure most importantly, medical exposures are generally beneficial to the patient. This is not often the case for non-medical ones. There may be a social benefit without the individual benefits that can be a disadvantage. [21] medical and non-medical exposures can be also differentiated by the level of consent required; the confidentiality of all aspects of the process, the framework to ensure that this is respected and, finally, the governance system in which the exposure takes place. For "bona fide" medical exposures, consent is not always negotiable, and there is also a high threshold for privacy in medicine. The governance framework is quite different, for example in migration assessment centers, in customs investigation units or in the airport security service. Issues related to ensuring good practice with non-medical exposures include wide-ranging diversity and distribution of governance arrangements for these. Exposures can be

And the results from these can be used away from governance arrangements for both medicine and radiation protection. Discussions within the EU favored the re-defining medical-legal exposures as medical. They also encouraged the wider development of "medical benefits" to include health and welfare, to include "benefits" as brothers and children in cases of injury, athletes and others may benefit from examination even when apparently without symptoms. This has the advantage of eliminating a problem by redefining. Finally, biomedical research with human volunteers may involve exposure to radiation for people without direct benefits for them. There is a wide range of legal provisions and ethical advice in this regard. [17,25]

THE ETHICS OF ADVERTISING RADIOLOGICAL SERVICES

Risks for doctors and medical institutions

While health care advertisements be beneficiary physicians and health care institutions by attracting new patients and increasing their income, the techniques described imply risks for both doctors and health care institutions. For example, advertising can change the patient's expectations in a manner that threatens the professional relationships that healthcare depends on. Patients requesting a specific promise-based investigation may be less interested in alternative therapies and disappointed if the intervention required is being countered by the attending physician. Doctors can consume valuable time to explain to the patient that they do not need that intervention, thus jeopardizing the expectations of other patients. Alternatively, as many doctors describe that they feel the pressure to prescribe a particular medication they would not use, just to respond to patients' demands from direct advertising to consumers (Frosch et al., 2010), physicians can be trying to provide a previous intervention "or to undertake a diagnostic activity that they do not feel is in the best interest of the patient only to respond to the requests triggered by advertising for these health services. health care if physicians do not agree with the recommendations in institutional announcements, thus jeopardizing the provider and institutional integrity. Knowledge that is considered inappropriate or uninformative can also erode patient confidence in providers and healthcare providers. as economist Kenneth Arr pointed out ow in his 1963 article on health economics, "even the word" pro fi t "is a signal that violates trust relationships" (Arrow 2004). Institutions that promise to act on patient welfare commitments but are considered as priorities for profits can be censored by the media and the public for a lack of transparency in competing interests and a failure to observe the fundamental ethical obligation to continue the patient's welfare.

Risks to the Society

Society places great value for medical care, while struggling to develop ways to pay for it. While the debate continues the means, large-scale targets are accepted and include quality improvements and lower costs. Thus, health promotion ads may pose risks for quality if patients are persuaded to pursue an investigation that is either useless and perhaps even harmful. Advertising-related costs - from which patients are largely protected - can be limited resources for health care and may reduce funds from public health plans or private insurance funds that are available to pay for the necessary services. Moreover, the costs of escalating these promotions can provide indispensable funding to provide high-quality care.

CONCLUSIONS

Regulatory efforts or uniform medical protocols could be strengthened by evidence to show that specific trends or techniques of medical imaging mislead patients clinically significantly and thus could have a negative impact on the quality and cost of healthcare. The legal and ethical analysis of fair public health options and dissemination of information should protect people from possible pitfalls in advertising campaigns without simply moving issues elsewhere. We believe that the possible crises and paradoxes inherent in our current system, along with the escalation of clinical publicity by health care institutions, signal the need for a wider review of health advertising beyond direct advertising to consumers of pharmaceutical products or medical supplies that are not needed, knowing that in Romania CT or MRI can be done at private clinics and at the patient's request for money, which can lead to irrelevant patients irradiation.

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Minimally invasive CAD/CAM ceramic restorations to restore worn dentition

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Abstract

Advancement in materials and technology available in today dentistry creates the opportunity for minimally invasive treatments also in cases of dental wear. New ceramic materials and adhesive protocols enable the minimalistic preparation design in order to conserve as much as possible the dental structures.

The aim of this article is to present the clinical protocol for the diagnosis, treatment planning, and execution of minimally invasive ceramic restorations. Proper indications and selection of the case, correct sequences of the treatment plan and state of the art execution can lead to success, not only in restoring patient esthetics and function but also in preserving the tooth vitality and the periodontal tissue health.

In specific clinical situations, minimally invasive ceramic restoration can be an excellent option for conservative restorative treatment.

Keywords: CAD/CAM, ceramic, dental wear, minimalistic preparation

INTRODUCTION

Loss of tooth hard structure also known as dental wear defines the situations in which the enamel and the dentin are gradually removed without the involvement of bacterial action. Nowadays, the percentage of patients that show signs of severe tooth wear varies from 3-17% and due to many confounding factors it presents an increasing problem in all age groups. [1-3].

The consequences of tooth wear can be extensive and pose a real challenge for both, the patient and the clinician, and the restorative treatment is mandatory [4,5].

One rehabilitation technique involves a minimally invasive prosthetic procedure and is divided into four steps: (1) an increasing in vertical dimension of occlusion(VDO) with provisional restorations fabricated from a correct wax-up, (2) minimally invasive tooth preparations, (3) final restorations using leucitic ceramic and (4) adhesive bonding of restorations [6].

There are also other materials that can be utilized for occlusal veneers, like hybrid ceramic, nano-ceramic resins and composite resins. Compared to ceramic restorations, composite resins have inferior long-term esthetic performance [7] and as a result, they are often considered as short term or interim restorative materials [8]. However, the main advantages of direct and indirect composite resin veneers when used in the anterior arch are the lower manufacturing cost and in the eventuality of damage, they can be easily repaired [4,7].

On the other hand, in the posterior arch, a number of in vitro studies have shown that indirect composite resin occlusal restorations may perform better than ceramics, having higher fatigue resistance and compressive strength [9,10]. What is more, when high occlusal loads are placed on ultra-thin CAD/CAM resin restorations, the survival rate is higher than that of ceramic restorations tested under the same circumstances [11]. Composite resin inlay/onlay restorations present a 5-year survival rate of 87% [12], while ceramic inlays/onlays/overlays of 95% [13].

The aim of this article is to present the minimal invasive approach and treatment of a patient with dental wear due to bruxism with the aid of chair side CAD/CAM ceramic restorations.

Aim and objectives

The aim of this article is to present the clinical protocol for the diagnosis, treatment planning, and execution of minimally invasive ceramic restorations. Proper indications and selection of the case, correct sequences of the treatment plan and state of the art execution can lead to success, not only in restoring patient esthetics and function but also in preserving the tooth vitality and the periodontal tissue health.

CASE PRESENTATION

1. ANAMNESIS

A 54-year-old female patient with no health issues was referred to the Clinic of Prosthodontics (Faculty of Dental Medicine, Timisoara) with the request to improve the esthetics of her anterior teeth. The patient did not present any systemic pathology and only desired the esthetic rehabilitation of the anterior worn out teeth. The informed consent was signed as well as the agreement the for publishing photos with the clinical case for scientific purposes.

2.CLINICAL EXAMINATION AND DIAGNOSES

Oral examination was performed assessing both the soft and hard tissues, periodontal status, occlusion and inter maxillary relationships. The patient presented moderate

attachment loss located in the lower anterior arch (3.2, 3.1, 4.1, 4.2) but with no gingival inflammation. Clinical evaluation showed an unaesthetic smile and a reduced VDO caused by the severe attrition (Fig. 1). Diagnostic models were obtained from polyvinyl siloxane impression and cast in type IV dental stone.

Figure 1. Initial status of teeth and gingival tissues

3. TREATMENT AND EVOLUTION

After a careful examination, the treatment plan started with an intraoral trial prosthesis (mock-up) based on the diagnostic waxing to evaluate the amount of OVD increase that was necessary to accomplish the esthetic and functional goals of the treatment. Preparation reduction was based on the proposed final restoration volume. Silicone was used as a template for transferring the wax-up to the patient's teeth with Bis-acrylic resin (Luxatemp, DMG). The proposed treatment plan consisted in a minimally invasive tooth preparation covered by ceramic veneers. Tooth preparation involved rounded shoulder finish line with a buccal reduction of 0.9 mm and a palatal reduction that stopped 2 mm above the gingival level. The initial length of the crown remained unaltered (Fig. 2, 3).

Figure 2. Buccal preparation vor ceramic veneers

Figure 3. Palatal reduction

Next, retraction cord was placed in the gingival sulcus for a better visualization of the finish line. A digital impression was taken using an intraoral scanner (PlanScan, Planmeca) (Fig. 4, 5) followed by the digital design.

Figure 4. Digital model:buccal aspect of the scan

Figure 5. Digital model:occlusal view

Then, the 8 veneers were milled from leucitic ceramic blocks (Empress CAD, Ivoclar) with the *in office* miling machine Planmill 40. (Fig.6). The veneers were glazed and prepared for adhesive cementation.

Figure 6. Empress CAD veneers after milling

The bonding protocol consists in several steps: etched for 60 seconds using hydrofluoric acid, rinsed, dried and silanized. The teeth were also prepared for adhesive cementation: brushing to remove all contaminants, good isolation with Teflon band was established then phosphoric acid (37%) was used to etch the preparations then washed and dried. A universal bonding was applied (Adhese, Ivoclar) dried and light cured for 10 seconds. Luting resin (Variolink Esthetic, Ivoclar) was applied on the veneers, starting with the central incisors and continuing with the rest of the veneers, one half arch at a time. Excess of material was immediately removed using dental floss and brushes, then the cement was light-cured for 2 seconds. Any remaining traces of cement were removed and each restoration was light cures for 25 seconds on each side. A final inspection of the occlusion was performed and any minor adjustments were addressed (Fig 7).

Figure 7. Empress CAD ceramic veneers after cementation

The fabrication of an occlusal splint has been recommended for the protection of definitive restorations from parafunctional occlusal forces.

DISCUSSIONS

Current evidence show that that either composite resin or all- ceramic restorations can lead to successful results. However, long-term randomized clinical studies are lacking, so material selection should be done cautiously assessing each patient's specific oral diagnosis and treatment expectations.

Different restorative materials have different indications and in patients with dental wear not all materials are suitable for treatment. Feldspathic porcelain was found to cause

greater antagonistic enamel wear compared to zirconia [14-16, 17, 18, 19, 20]. Lithium disilicate ceramics caused less wear to opposing enamel compared to feldspathic porcelain, but greater wear compared to zirconia [18]. Overall the most ''wear friendly'' material were the composite restorations when compared to ceramics and zirconia [21, 22, 23].

However, there are instances in which different restorative materials are need as treatment solutions that in the long term may lead to occlusal and esthetic problems [24, 25].

CONCLUSIONS

Maximum preservation of dental structures is the motto that guides lately the clinical approach in dentistry. As a result, partial coverage restorations and adhesive procedures are rapidly gaining more attention in the treatment of patients with dental wear. Although the treatment for worn out teeth may prove challenging, with a correct anamnesis and a careful planning successful rehabilitation can be achieved. Also, determining the etiological causes is critical for choosing the best material for the prosthetic restorations. The most frequent used materials for the restorations at this moment are ceramic and composites. However, choosing one type of material over the other should be done with caution as more long term studies are needed to determine which one possesses the best overall qualities.

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The influence of the cementation protocol for CAD/CAM all-ceramic restorations. A literature update.

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Abstract

Aim and objectives

The propose of this literature update includes aspects of different surface treatment strategies of all-ceramic restorations, providing clinical recommendations for daily use.

Materials and methods

A search of English language literature was fulfilled. The search included articles published between 2003-2018 in Pubmed database which provided results regarding clinical surface treatments of all-ceramic restorations.

Results

The literature shows that there is no material for universal use. The dental substrate has it's best results with etching and priming on enamel, while the 9,5% hydrofluoric acid used for 4min on the ceramic surface generates proper porous strutures.

Conclusions

Optimizing the clinical performance of all-ceramic prosthodontic restorations depends on the use of specific surface treatments, in order to obtain esthetic, functional and long-lasting requirements.

Keywords: *all-ceramic restorations, cementation protocol, adhesive systems, surface treatment*

INTRODUCTION

Since 1965, when McLean [1] introduced the concept of adding aluminium oxide to feldspathic porcelain in order to improve mechanical properties and physical properties, the main aim of the researchers was on aspects such as friability, marginal fitting, tensile strength or crack propagation [2]. Major complications such as fracture of the veneering ceramic or of the coping, followed by the neglection of adhesion and bond strength of the cement are reported as failures of prosthodontic all-ceramic restorations [2,3,4]. The interface between dentin and cement is usually more susceptible to failure than the enamel - cement or ceramic – cement ones [4,5].

The success of these treatments is dependent upon obtaining sufficient adhesion, achievable with enamel etching with phosphoric acid while the bonding surface of the ceramic is conditioned with an acid etchant as well. The silanized ceramic surfaces will ensure the bond between the resin cement and the veneered ceramic.

The most efficient process in obtaining bond integrity between ceramic and cement is the acid etching. The etching procedure, using hydrofluoric acid applied on the ceramic, generates a porous structure which will facilitate the retention between the resin composite luting cement and the ceramic. Another propose of the etchant is the cleansing of the ceramic by removing undesirable oxides and debris.

More advanced solutions like self-etch adhesive cements were elaborated in order to simplify the cementation process, which will assure the etching and the priming of the dental tissues simultaneously [6]. Regardless of the constant effort of manufacturers in the development of user-friendly cements, it is questionable if the clinicians should always use the self-etch system over the conventional luting procedure with separate etching and priming [7].

The clinical performance of all-ceramic restorations is guided by the chosen restorative material combined with the proper adhesive system. Obtaining the bond between the substrates of a less- or non-retentive restoration can be a challenge, which demands the use of adhesive systems, including self-etch and dual cure resin cements [8].

Clinical studies document successfully long-term results of resin bonded veneers [9], intra-coronal restorations [10] or ceramic crowns [10,11]. A stable, lasting resin retention will support a proper marginal adaptation without microleakage, increasing as well the fracture resistance of the all-ceramic restoration. [12,13].

MATERIALS AND METHODS

A search of English language literature was completed seeking evidence for the most efficient tooth surface treatment strategy in all-ceramic restorations. The search included 28 comparative articles published between 2003 and 2018 included in PubMed database. 23 papers provided results regarding the tooth surface treatment strategies as a clinical perspective.

Test results were transferred into shear bond strength tests of different cements – adhesive and self-adhesive with various tooth surface treatments – none, etching 60s enamel & 10s dentin, priming 20s & blow-dry 5s enamel and dentin or etching and priming on enamel and dentin of human teeth (using Swiss shear test design) [14].

RESULTS

The literature shows that clinical situations require various all-ceramic materials combined with adhesive systems and that there is no material for universal use. A total of 23

articles that fulfilled the inclusion criteria of surface treatments were identified. 5 related clinical trials were also reviewed.

All in all, regarding the dental substrate, the best results for all cements were achieved with etching and primer on enamel.

Using the 23% acidulated phosphate fluoride etchant for the ceramic for 10 min is insufficient in order to create the desired mechanical interlocking, compared with the 9,5% hydrofluoric acid used for 4 min, which generates more aggressive etching patterns and porous structures.

Acidulated phosphate fluoride contains a lower concentration of hydrofluoric acid, reason why it acts more superficially on the ceramic.

Overall the bond strength is higher in the use of hydrofluoric acid etching.

DISCUSSIONS

The longevity of prosthodontic restorations has been improved by the adhesive cementation [15,16,17]. An all-ceramic restoration which is luted by composite resin cement proves clinical performance even if it has to withstand high masticatory forces [18]. In cases when the finish line cannot be maintained in enamel the clinician should take other restorations in consideration, whose retention is not dependent on adhesion [19].

The link to performing a better bond between the dental substrate and the prosthodontic restoration may be the self-cure modes of the dual-cure cements.

A deficient transmission of light through the all-ceramic restoration can produce inadequate polymerization of dual-cure resin cements, which may affect the support of the restoration [20].

Ceramics like alumina or zirconia which have a crystalline content have to be silica-coated before being silanized because these do not contain a glass phase suitable for the etchant. Before bonding resin to zirconia, this material must be treated either air abrading of the surface with alumina particles or silica-coating before silanization, in order to achieve adequate bond strengths.

Self-adhesive cement systems may become the link in the development strategy of bond materials.

CONCLUSIONS

Optimizing the clinical outcomes of all-ceramic restorative materials depends on the use of the surface treatments. Hydrofluoric acid etching combined with silanization can assure optimal bond strength compared to other etchants. Etching and primer should be applied in case of the use of conventional adhesive and self-adhesive cements, to increase the bond strength.

The successful use of all-ceramic materials depends upon the clinician's knowledge to choose the proper material combined with the adequate cementation or bonding technique in order to achieve esthetic, functional and long-lasting requirements.

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How mothers` educational level is reflected on the children oral health behavior?

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Abstract

It is widely acknowledged that the behavior of parents affect their children's health. This study aimed to evaluate the relationship between oral health behavior of the children in relation with the mothers level of education. In this regard, we used as indicators frequency of teeth brushing, the period of brushing and regular check-ups to the dentist. The size of our sample consists of 163 guardians of the children from School No 21 "Vicentiu Babes" Timisoara and the research instrument for collecting the data was a questionnaire based on 20-items. According to our research results, we can conclude that higher level of mother education is associated with better family practice such as: higher frequency for going to the doctor, regular check-ups except of pain and emergency or better check-ups of children brushing teeth. In the same time our date do not support any evidence based for the relation between mothers' level of education and the children oral health practice such us frequency of brushing teeth, period of brushing and using of auxiliary methods.

Keywords: oral health**,** mothers, education level, dental check-ups.

INTRODUCTION

Oral health affects many aspects of a child`s overall health and well-being, including speaking, eating, self-esteem, physical appearance and quality of life (Drum MA, 1998). Behavioral and social factors significantly impact oral health. Tooth brushing is considered to be an important method for maintaining gum health and controlling plaque formation, particularly when combined with fluoride toothpaste. For this reason, the role of tooth-brushing in the prevention of caries has long been considered self-evident. In the same time there is little evidence to support the notion that just tooth brushing action without respecting several criteria as time for brushing or instruction, could reduces caries. Recent publications have shown that daily tooth-brushing with fluoride toothpaste and for 2 minutes, significantly reduces caries incidence compare to a control group that also brushed with a fluoride toothpaste but receive no instructions restricting rinsing (Tinanoff, 2002). Another important aspect in terms of brushing teeth is the daily frequency. This point, we know that twice per day brushing with fluoridated toothpaste is effective universally recommended (Milgrom, 2011). Realized twice per day, it works by disrupting the bacteria growing on the teeth and by providing a reservoir of fluoride to repair the damage caused by the acid of the bacteria.

Adair et al. found that the most significant predictors of children's favorable habits were parents' favorable attitudes towards controlling their children's tooth brushing and sugar snacking habits (Adair, 2004). In the same direction, other scholar as Smedley and Syme also show that individual behaviors such as oral hygiene practices and attendance for dental care are largely influenced by family, as well as by the social and community factors, or political and economical measures (Smedley, 2000). The more positive attitudes of the parents` toward dentistry, the better will be the dental health of their children (Friedman LA, 1976). Studies have reported that poor attitude of parents toward oral health of infants and young children are associated with increased caries prevalence (Hinds K, 1995). Young children's oral health maintenance and outcomes are influenced by their parent's knowledge and beliefs, which affect oral hygiene and healthy eating habits (Suresh BS, 2016). Parent's knowledge and positive attitude toward good dental care are very important in the preventive cycle.

There is an association between oral health knowledge, age, and the education level of mothers, which are directly linked to the status of their children's oral health (Petersen, 2005). Oral health is an integral component of general health that plays an essential role in the life of a child.

MATERIAL AND METHODS

The paper will explore the relation between the sanogenos oral health behavior of the children and the mothers' education level. In order to achieve our aim we chose to conduct a special social survey in may 2017. The total size of the sample consists of 163 guardians of the children from School No 21 "Vicentiu Babes" Timisoara. Approval to conduct the study was obtained from the University of Medicine and Pharmacy "Victor Babes" from Timisoara. A questionnaire was designed to assess the knowledge and the attitude of mothers regarding oral health of their children from primary classes. The 20-item questionnaire in local language covered socio demographic characteristics, oral hygiene practices and methods, the frequency and the reason of dental check-ups, and also, the educational level of the mothers. Some questions were modified after a pilot study was carried out with a convenience sample of mothers to improve understanding and clarity. In addition, we evaluated complementary methods of keeping dental hygiene and at least the specifics of the relation with the dentistry doctor characterized by dimensions such as: frequency of visit and reason for the visit of the

children. The data management was carried out using the statistical software SPSS. The statistical significance of the bivariate analysis was processed through the Spearman correlations and the descriptive analyses were carried out using frequency and crosstabs analyses.

The hypotheses that conduct our research are:

1. Brushing teeth frequency of the children is directed correlated with the mothers` level of education.

2. The brushing period of the children increased simultaneously with the mothers` level of education.

3. The use of auxiliary methods on cleaning the children`s teeth are related with the mothers` level of education.

4. Check—ups of children brushing is not dependent on mothers' level of education.

5. Frequency and purpose of the visits to the dentist are related to the mothers` education level.

RESULTS

The first question of our approach was related to the frequency of how often children brush their teeth. According to our responses 35.2% of respondent parents declared that their children have brushed teeth once a day, 38% of the parents declared that their children brushed their teeth twice a day, while 5% declared that their children brushed their teeth two or three times a day, during the last week. Still 20% of parents declared that their children brushed their teeth only one time at several days (see Figure 1). Starting from this variation of responses, our purpose was to see if any correlation exists between the frequency of brushing teeth and the mother level of education. According to our statistical results no significant variation exists between cases where the mother has a high level of education compared with the situation when the mother has a medium or a lower level of education. (N=136; sig=,866; Spearman's rho= -,015). In consequence the level of instruction of the mother does not present any influence for the daily practice of cleaning teeth done by their children. This result infirms our first hypothesis which considered that the mother education level influences the daily practice of cleaning teeth of the children.

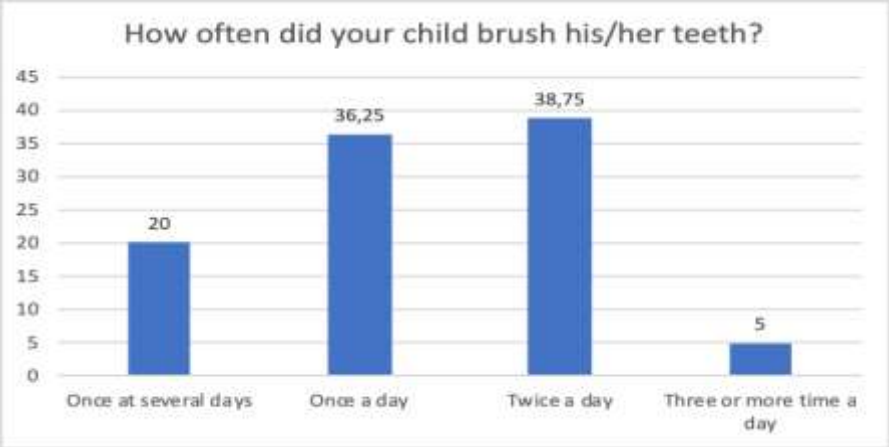

Figure 1. Frequency of how often children brush their teeth

The second indicator that was used to analyse the sanogenos behavior of the children was the time spent to brush teeth. Our scale was constructed using three intervals: less than 1 minute, between 1 minute and 3 minutes, and more that 3 minutes. Our data show that more that 50% of our respondents declare that their children brush their teeth between 1 and 3 minutes, while the period less than 1 minute for 19% of the respondents and more that 3 minutes for 22% of the respondents (see Figure 2). According to or hypotheses, we expected

that the period of brushing is higher for children with better educated mother. Unexpected for us, the results show that there is no significant variation when the period of brushing is analysed in relation with the mother's level of education (N=128; sig=.762; Spearman coef. = -,027)

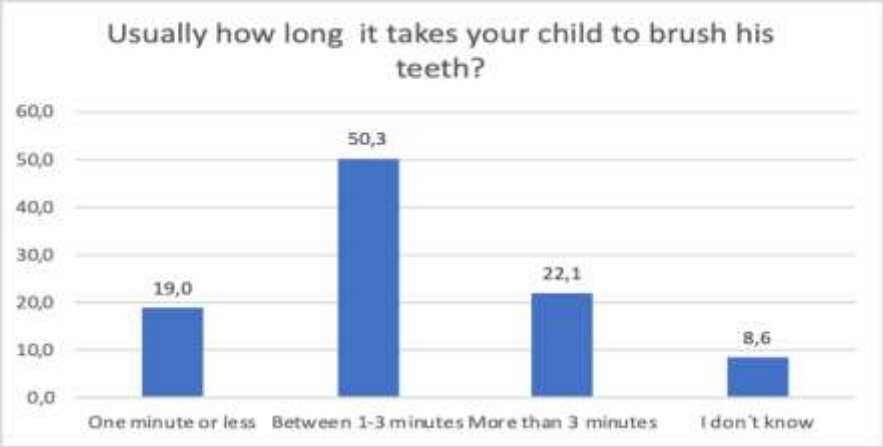

Figure 2. Period of brushing analysed in relation with the mother's education

Another indicator that manifest interest for our research is related to the auxiliary methods for cleaning teeth. In this respect, our objective was to identify how many respondents declare that their children use auxiliary methods and how this use is related to the level of education of mother. We consider for our analyse two alternative methods for cleaning the oral cavity: mouth water and the dental floss. Our first results related to this issue show that mouth water is considerable more used compare with the dental floss (see Figure 3). 16% of respondents declare that their children used mouth water after every brushing while just 3,7% declare that their children used dental floss. Occasionally, the mouth water is used by 26% and the dental floss by 9%. All this percentages are associated with the a high rate of children that never used auxiliary methods for cleaning oral cavity (49% of never use the mouth water and impressive more, 77% never use dental floss).

In order to have a better understanding on how the use of auxiliary methods of cleaning the teeth of the children is related to the mother education level, in the first step we created an index form 0 to 2 where 0 is associated with the children that do not use any auxiliary methods, 1 for the children that use one out of two and 2 for the children that use two out of two auxiliary methods. In the second step we conduct a correlation analyse between this index and the level of education of the mothers. Contradictory with our initial expectation, no relation was found between the use of auxiliary cleaning methods and the mother's level of education (N=136; sig=.881; Spearman coef.=,013).

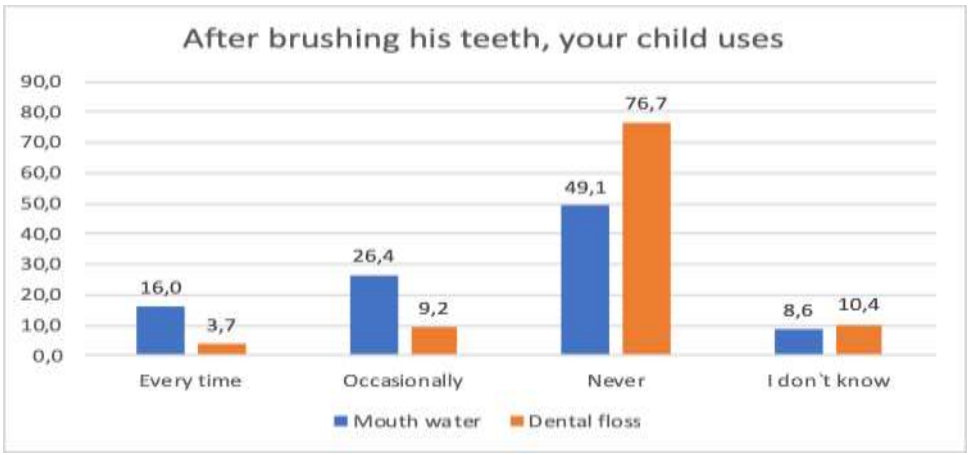

Figure 3. The use of auxiliary cleaning methods in relation with the mother's education

The last indicator used in order to understand children behavior and experience related to oral health is related to the frequency of reporting dental problems by the children. On this regard, we can see that around 7,4% declare that their children report dental problems every month or even more often. 28% indicate that dental problems are reported by the children once at every 2-3 months. For 34% such problems are present just once per year while for 28% it did not happen yet. In terms of correlation between the report and the level of education, there is no evidence for such a relation.

Another set of indicators, relevant for sanogenos behavior, are related to the activity of family. In this respect we paid attention firstly to the check-up of the children they brush their teeth and secondly to the visits at the dentist doctor. Our data showed that 91% of our respondents declare that in their family children are checked if they brush their teeth, while 9% do not do that or they do not know about such an activity. In the second step our aim was to identify if there is any variance in reporting to these activity in relation with the level of education of parents and precisely with the mothers` level of education. Our crosstabs analyse conducted between these two variable showed up a gradually increase of the checking activity in correspondence with the level of education of the mothers. 90% of mothers, that graduated primary or middle school, declared that in their family someone checks the children if he/she brushes their teeth and the percentagez arrive at 100% for the family where mothers have an university degree (see Figure 4). Even if the results could be considered overestimated, our aim was to identify if this difference is statistically significant. The Spearman correlation illustrate that the difference has a low degree of significance and that the result is associated with a small but a significant difference between different level of education (N=134; sig=,043; Spearman coeff.=-175*).

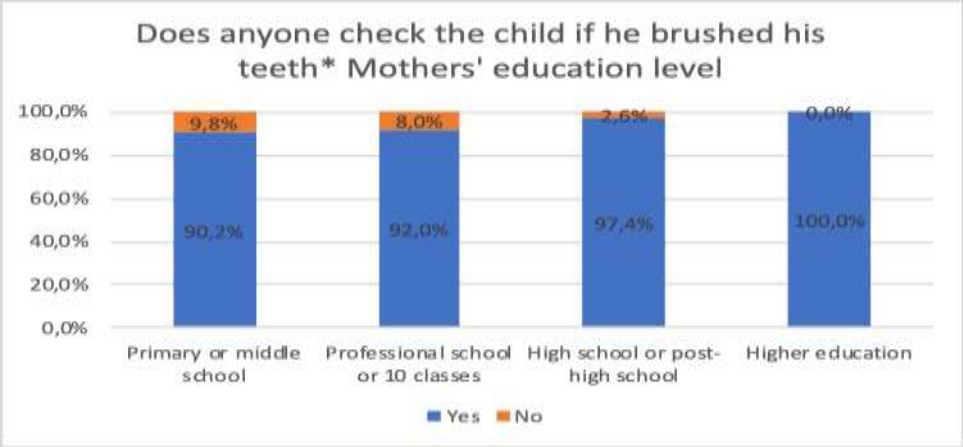

Figure 4. The activity of checking the children if they brush their teeth, in relation with the mother's education

Visiting the dentist doctor was the second aspect that interests our research. In this respect, we paid attention if a visit to the doctor was already done, to the regularity of doing these visits and not the least to the reason of doing these visits. Related to our first question, we find out that 74% of our respondents already went with their children to the doctor, while 23% did not go yet and 3% do not know if such an activity was done in their family. When these results are analysed in relation with the mothers' level of education we can see an important variation between different education level categories. Children with mother education at primary and middle school have been to the doctor in proportion of 63%. This percentage increased gradually with the mother level of education and arrived at 81% when mother have professional school degree level and at 96% when the children mother have university degree level (see Figure 5). These difference is also statistically significant different (N=135; sig=,003; Spearman coeff.=-258**). This results strongly support the hypotheses that

visits to the doctor are correlated with the mother's level of education. The higher education level is associated with the smaller percentage of person that did not go to the doctor.

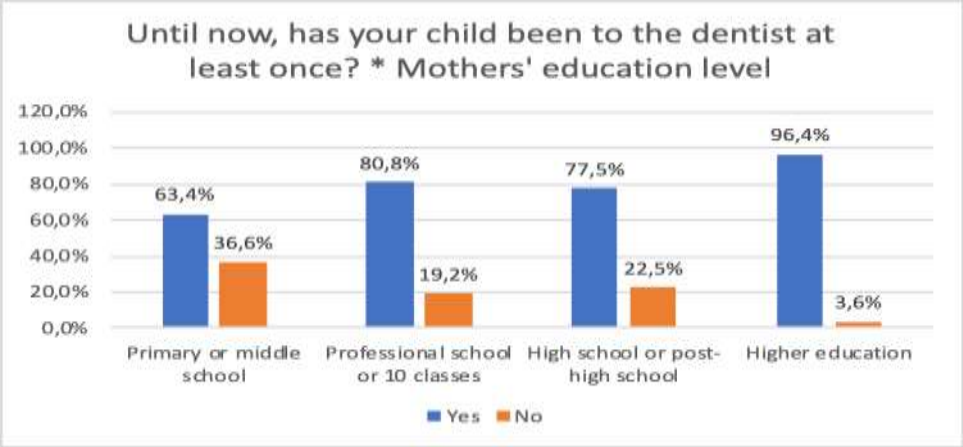

Figure 5. Visits to the doctor in relation with the mother's level of education

According to the literature the routine check-ups by the doctor, except for the situation when pain or an emergency has arrived, are important predictors of oral health. In these regards we propose to analyse how many children use to visit the dentist for the routine check-ups and secondary how these visits are correlated with the level of education of the children`s mother. According to our data 52% of children used to have a routine in visiting the dentsit, while 46% of them went to the doctor just when pain or an emergency arrived. More than that, our data showed that this behaviour is strong correlated with the mother level of education. 56% of the children with mother having middle school and 65% with mother`s education level at professional school, use to go to the dentist just when the children have pain or it in an emergency situation. The percentage of the visits just in such condition is impressive lower when the level of education of mother is at the university degree: 21%. This difference of behavior is significantly different when it is analysed in correlation with the education level (N=136; sig=,002; Spearman coeff.=-,260).

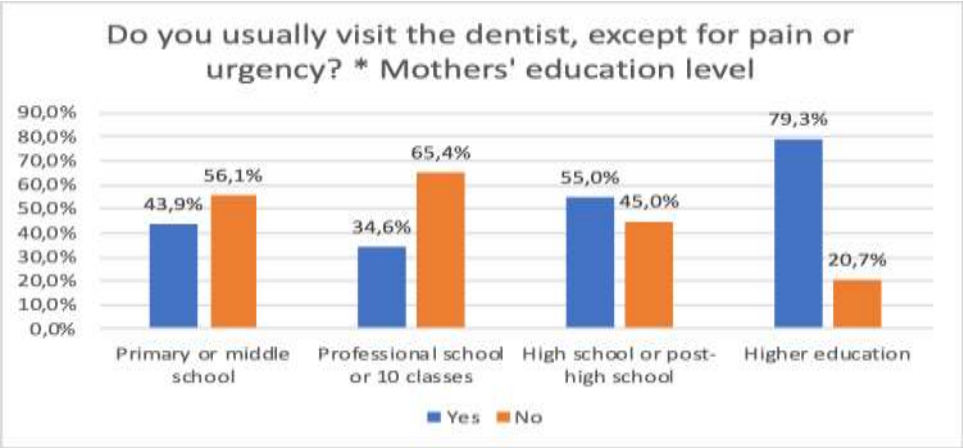

Figure 6. The visit to the dentist: for routine check-ups, pain or emergency situation

Visit doctor frequency was our last indicator. In this respect we analysed how often children use to visit the dentist doctor. Our data shows that 11% used to do such a visit every two-three months, 30,7% at every six months 15% once a year and around 40% just in case of emergency. As in the previous situation our aim was to identify if any relation exists between this behavior and the mothers' level of education. Figure 7 shows that mothers` with higher level of education used to go with their children more frequently compared with the mothers

with lower level of education. More precisely, in the case of university degree the mainly behavior is to go to the doctor at every six months or even every 2-3 months. When the level of education is primary of middle school the behavior is considerable different and the majority of respondents, 53.7%, declare that they went to the doctor just in case of emergency. This difference of behavior is also statistically significant correlated with the education level. With N=135; sig.=,000 and Spearman coeff.=-363*** our data strongly support the hypotheses that frequency of visits to the doctor increased directly proportionally with the level of education of parents.

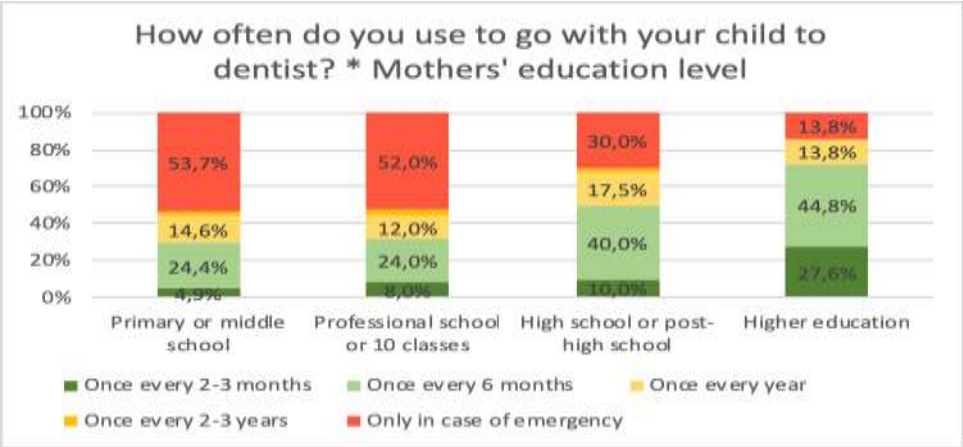

Figure 7. The frequency of visits to the doctor

DISCUSSIONS

Parental knowledge, attitude, and practices can have an impact on children's oral health. Children under the age of five years generally spend most of their time with parents and guardians. These early years involve "primary socialization", during which the earliest childhood routines and habits are acquired (Featherstone, 2004). During the first three years during the pre-school period, the role of parents is important in maintaining the good oral health of the child (Elham, 2013). Oral health of the children is associated with oral health knowledge of their mothers/guardians, as oral health related habits (such as those related to oral hygiene and diet) are established during infancy and maintained throughout early childhood (Wendt LK, 1996). Parents, especially mothers, function as role models for their children.

One of the basic factors that may give some idea about oral health awareness among parents is the frequency of dental visits, (DH., 1992) and the mother with higher educational qualification does visit the dentist more often.A randomized control trial in UK showed that visits to trained dental educator (dentist) by mothers of pre-school children at risk of caries increased the parental knowledge and improved the attitude toward dental health of their offspring (Blinkhorn AS, 2003).

CONCLUSIONS

According to our research results, we can conclude that higher level of mother education is associated with better family practice such as: higher frequency for going to the doctor, regular check-ups except of pain and emergency or better check-ups of children brushing teeth. In the same time our date do not support any evidence based for the relation between mothers' level of education and the children oral health practice such us frequency of brushing teeth, period of brushing and using of auxiliary methods.

Acknowledgements

All authors had equal contributions and should be considered main authors.

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Surface electromyographic study in patients with Angle Class II malocclusion

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Abstract

Aim: The objective of this paper is the evaluation of muscle activity using electromyographic (EMG) examination in patients with Angle Class II division 1 and division 2 malocclusion.

Material and methods: The study was conducted on a group of eighteen patients. The EMG exam used surface electrodes placed on the following muscles: temporalis, masseter, orbicularis oris and mentalis. The muscles were first examined at rest, and afterwards, we continued with the examination of the muscles during contraction. The recorded electromyogram allowed the assessment of the motor unit potential parameters – amplitude, duration and frequency, as well as the evaluation of the functional symmetry.

Results and conclusions: The obtained values were interpreted according to the normal values of the analysed parameters for each patient. In Angle Class II division 1 malocclusion the activity of the temporalis muscles was reduced in all the examined cases. In Angle Class II division 2 malocclusion we found the hyperactivity of the mentalis muscle in all the cases.

Keywords: surface electromyography, Angle Class II, malocclusion

INTRODUCTION

Electromyography (EMG) is an objective paraclinical technique for assessing the efficiency and the function of the muscles by detecting and evaluating the electrical potentials of the motor units [1]. EMG allows the identification of muscle behaviour disturbances involved in the onset and/or development of dento-maxillary anomalies, by functional evaluation of the oro-facial muscles and the muscles of mastication.

The merit of introducing electromyography for the first time as a method of investigation in the field of dental medicine belonged to Robert E. Moyers [2]. It emphasizes the importance of a balance between intermaxillary relationships and the activity of the perioral muscles.

The main purpose of surface electromyography is to detect the bio-currents of the muscle fibres corresponding to the area on which the surface electrodes are placed. This summation of the temporal and spatial activity of the motor units determines the intensity of the recorded signals [3].

Aim and objectives

The aim of this paper is the evaluation of muscle activity by use of the electromyographic examination in patients with Angle Class II division 1 and division 2 malocclusion.

The recordings were conducted for the activity of the following muscles: temporalis, masseter, orbicularis oris and mentalis. We evaluated and interpreted the electromyographic changes of the muscle activity at rest and during function.

MATERIAL AND METHODS

The study was conducted during a period of fourteen months, in a group of eighteen patients with Angle Class II division 1 (eight subjects) and division 2 dento-maxillary anomalies (ten subjects).

These patients addressed for orthodontic treatment to the Department of Orthodontics of the Faculty of Dental Medicine, „Victor Babes" University of Medicine and Pharmacy Timisoara, Romania.

The patients were investigated in the Laboratory for Functional Explorations of the County Hospital in Timisoara. All patients signed the written consent to participate in this investigation.

Investigation method

RECORDING CONDITIONS

The room temperature was 21-24°C, because lower temperatures induce EMG changes caused by muscle contractions.

Previous to the EMG examination, the examiner informed the patients regarding the procedure, in order to ensure an optimal psychological state. The patient was sited in a comfortable position, in order to achieve muscular relaxation.

THE ACTUAL EMG EXAMINATION

The first to be assessed was the temporalis muscle, followed by the masseter, orbicularis oris and, eventually, the mentalis muscle. In the case of the temporalis and masseter muscles, the examination was done bilaterally.

The muscles were first examined at rest, and afterwards, we continued with the examination of the muscle during contraction (Figure 1, 2, 3 and 4).

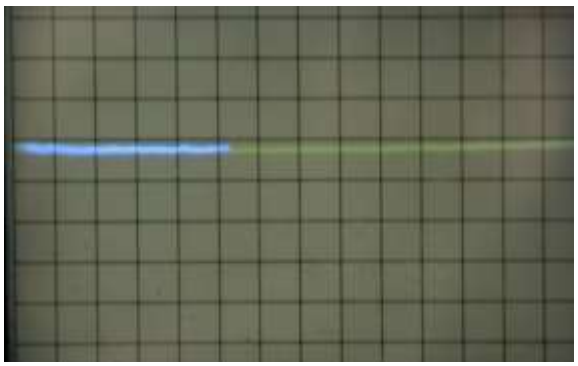

Figure 1. The EMG trace for the temporalis muscle

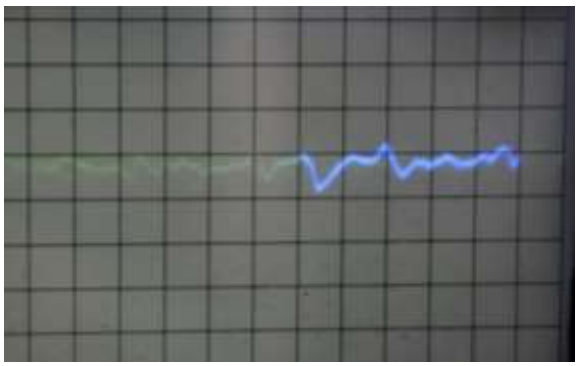

Figure 2. The EMG trace for the masseter muscle

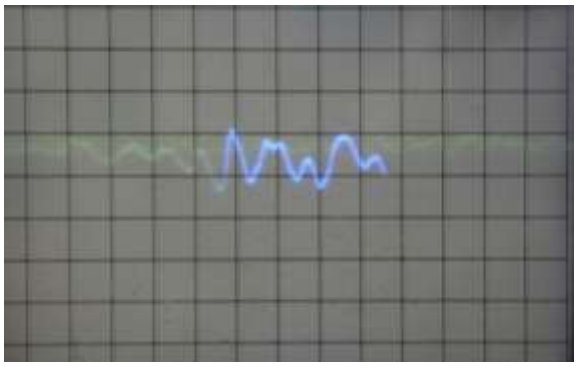

Figure 3. The EMG trace for the orbicularis oris muscle

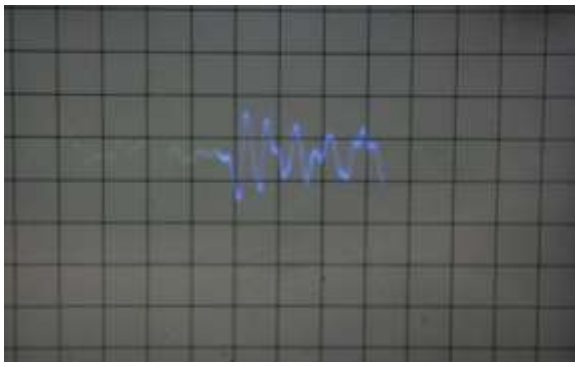

Figure 4. The EMG trace for the mentalis muscle

The recorded electromyogram allowed the assessment of the motor unit potential parameters – amplitude, duration and frequency, as well as the evaluation of the functional symmetry.

AMPLITUDE expresses the contraction force of muscle fibres whose activity is collected by the electrode and has a normal value of 200-500 mV. It reveals the contraction force of the group of muscle fibres with which the electrode comes into contact. It is the result of the electric field generated by the summation of action currents of all the fibres in the group.

DURATION represents the time needed for the graphic recording of the electrical changes which take place in a motor unit upon a single contraction. It depends on the structure of the muscle, being higher in muscles with motor units composed of a higher number of fibres and lower in muscles with a more refined activity. The normal duration of potentials for the examined oro-facial muscles is 5-6 ms.

FREQUENCY (RECRUITMENT PATTERN**)** depends on the periodicity of motor neuron discharge and directly increases with the intensity of muscle contraction. We consider that a pattern of recruitment is low or increased depending on the degree of overlap of the motor unit potentials. If on the EMG trace a large number of motor unit potentials overlap over each other, so the phenomenon of temporal summation occurs, then there is an increase in the frequency of the potentials. If the pattern of recruitment of motor unit potentials is increased, the examined muscle has a certain degree of hypertonicity, instead a low recruitment pattern denotes a hypotonic muscle. The normal values of the frequency of the motor unit potentials, depending on the intensity of muscle contraction, range from 4-6 Hz to 50-60 Hz.

The EMG examination used surface electrodes. The electrodes were placed on the surface of the tegument corresponding to the muscles to be examined, oriented in the direction of the muscle fibres as determined by palpation. More precisely, the surface electrodes were positioned at the level of the anterior fascicle of the temporalis muscle, the superficial portion of the masseter muscle, the orbicularis of the upper lip and the mentalis

muscle. The patient's teguments were degreased with an alcohol solution and then the surface electrodes, covered with electrolytic gel were placed and fixed with an elastic band.

The subject was asked to perform a muscle contraction of very low intensity. The bioelectric activity appeared as a simple trace by detecting the bio-currents of the motor units. The examination was repeated, while the subject was asked to gradually increase the muscular contraction force to the possible maximum.

In this manner, if during muscular rest no bioelectrical activity was obtained, and during gradual contraction, a concordance occurred between the intensity of contraction and the richness of the simple EMG trace, with a progressive shift from a simple trace to an intermediate and then interferential trace, this supported the existence of a normal bioelectrical activity in the examined muscle.

RESULTS

For each examined muscle (temporalis, masseter, orbicular oris and mentalis), based on the EMG traces, the following parameters of motor unit potentials were analysed: amplitude (Table 1), duration (Table 2) and frequency (Table 3). The obtained values were interpreted according to the normal values of the analysed parameters for each patient.

Table 1. Interpretation of the electromyogram according to the amplitude of motor unit potential

	Angle Class II/1		Angle Class II/2	
	Amplitude	Incidence	Amplitude	Incidence
Temporalis	low	100%	high	40%
			low	60%
Masseter	high	25%	high	80%
	normal	25%	normal	20%
	low	50%		
Orbicularis oris	high	100%	high	60%
			normal	40%
Mentalis	high	100%	high	80%
			normal	20%

Table 2. Interpretation of the electromyogram according to the duration of motor unit potential

	Angle Class II/1		Angle Class II/2	
	Duration	Incidence	Duration	Incidence
Temporalis	low	100%	low	100%
Masseter	high	50%	normal	100%
	normal	50%		
Orbicularis oris	normal	100%	normal	100%
Mentalis	normal	100%	normal	100%

Table 3. Interpretation of the electromyogram according to the frequency of motor unit potential

	Angle Class II/1		Angle Class II/2	
	Frequency	Incidence	Frequency	Incidence
Temporalis	low	100%	low	100%
Masseter	high	25%	low	100%
	normal	25%		
	low	50%		
Orbicularis oris	high	100%	normal	100%
Mentalis	high	100%	high	50%
			normal	50%

Based on the analysis of the EMG, a functional left-right asymmetry could be revealed in certain patients.

This functional left-right asymmetry was found in four of the eighteen patients: in two cases with Angle Class II division 1 malocclusion and in two cases with Angle Class II division 2 malocclusion.

In the subjects with Angle Class II division 1 anomaly, the following changes were noted:

- Right-left functional asymmetry in the case of the masseter and temporalis muscles in two of the eight examined cases;
- In the case of the right temporalis muscle, the EMG reveals low values of amplitude, duration and recruitment pattern of motor unit potentials, while the examination of the left temporalis muscle shows increased values of the same parameters of potentials;
- For the right masseter muscle, the EMG had a normal aspect, but, for the left masseter muscle, the specific amplitude, duration and recruitment pattern parameters showed decreased values.

In the subjects with Angle Class II division 2 anomaly, the following aspects were found:

- Right-left functional asymmetry of the temporalis muscles in two of the ten examined cases;
- For the left temporalis muscle, the EMG aspect was normal;

In the case of the right temporalis muscle, the EMG revealed decreased values of the specific potential parameters (amplitude, duration and recruitment pattern).

DISCUSSIONS

ANGLE CLASS II DIVISION 1 MALOCCLUSION

The results we obtained by evaluating the EMG in patients with Angle Class II division 1 anomalies revealed, in concordance with other published studies [4-7], a decreased muscular activity, characteristic for these patients, most probably due to the divergent dentofacial morphology and occlusal conditions caused by unstable contacts. This aspect has been reported by Pancherz [4] in his study analysing the electromyographic activity of mastication muscles in patients with normal occlusion and in those with Angle Class II division 1 malocclusion, during intercuspation of teeth in centric occlusion and during mastication. In maximal intercuspation, in patients with Class II malocclusion, lower activity of the masseter and temporalis muscles was recorded as compared to the control group, and during mastication, the electromyographic analysis revealed a lower activity of the masseter muscle in patients with Class II anomalies as compared to patients with normal occlusion.

Graber [7] also considers that, in Angle Class II division 1 malocclusions, the abnormal activity of the muscles is connected to the severe basal dysplasia which causes the onset of dental malpositions, as well as changes in the normal muscular function which adapts to skeletal disorders.

The EMG aspects obtained in the present study revealed a marked reduction in the activity of the temporalis muscle in all of the eight examined cases, manifested by decreased values of all the specific parameters of motor unit potentials (amplitude, duration, recruitment pattern). Also, we observed a decrease in the electromyographic activity of the masseter muscle in most cases, the low values of the parameters (decreased amplitude in 50% of cases, low duration in 50% of cases and low recruitment pattern in 100% of cases) still revealing a less marked reduction in the activity of the masseter muscle as compared to the temporalis muscle. The EMG examination showed a slightly increased activity in the case of orbicularis oris and mentalis muscles (increased amplitude and recruitment pattern with a normal duration of motor unit potentials). This activity may be explained by the effort of patients with Angle Class II division 1 anomalies, who often have lip incompetence, to close

their lips because of their anteroposterior dental discrepancy (increased overjet) in order to achieve lip competence. Depending on the degree of the overjet, but also on the pattern of mandibular growth, patients may or may not present lip incompetence at rest. In cases with lip incompetence, subjects with Angle Class II division 1 anomalies try to establish a firm lip contact, the clinical facial examination of the patient most often revealing the lips in forced contact, but also the double chin aspect because of the contraction of the mentalis muscle which contributes to lip closure.

In a study on children with Angle Class II division 1 malocclusion, Moyers [2] found the dysfunction of the temporalis muscle at rest and during the habitual occlusion.

ANGLE CLASS II DIVISION 2 MALOCCLUSION

Published studies show that in Angle Class II division 2 anomalies, most often there is compensatory muscle activity, especially of the posterior fibres of the masseter and temporalis muscles. This aspect could be also revealed in the present study so that in patients with Angle Class II division 2 anomalies an increased electromyographic activity of the masseter muscle was observed in 80% of cases. This may be explained by a constantly increased activity of the elevator muscles of the mandible correlated to a grinding mastication pattern, frequently encountered in these patients because of the predominance of vertical mandible movements. A slightly decreased activity of the temporalis muscle has also been revealed (decreased values of duration and recruitment pattern in 100% of cases and of amplitude in 40% of the investigated cases).

A hypertonic lower lip may lead to the palatal inclination of the upper incisors especially when there is also a high lip line which may further cause the onset or aggravation of Angle Class II division 2 anomaly. This increased activity of the orbicularis oris muscle has been identified in 60% of the investigated cases.

The presence of a pronounced mento-labial sulcus, characteristic for patients with Angle Class II division 2 anomalies, reveals hyperactivity of the mentalis muscle, observed in 80% of the investigated cases.

Age is an important factor, that should be taken into consideration during the examination of muscle activity [1]. The study by Ueda, Miyamoto, Saifuddin, Ishizuka and Tanne [8] showed a longer duration in the activity of the masseter muscles in adults and the temporalis muscles in children during a surface EMG examination in one day. The authors considered the incomplete development of the muscles, dentition and temporomandibular joints, to be the main cause for the EMG results.

CONCLUSIONS

Surface electromyography, used as a paraclinical investigation method of the muscular function, allows the identification of muscle behaviour disorders involved in the onset and/or development of dento-maxillary anomalies.

In Angle Class II division 1 malocclusion the activity of the temporalis muscles was reduced in all the examined cases. In Angle Class II division 2 malocclusion we found the hyperactivity of the mentalis muscle in all the cases.

The EMG examination proves to be a useful method for the evaluation of muscle activity in patients with dento-maxillary anomalies. In future studies, the EMG examination could prove an important tool to assess the treatment results from a functional perspective as well as to establish whether the results are stable in time.

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Study uppon facial proportions in patients with different ethnicity - a pilot study

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Abstract

Facial aesthetic has always been a goal of most dental treatments. However, beauty norms as well as certain facial features are influenced by the ethnic heritage of each individual. Our study wishes to determine if such differences exist, which are they and if there actually is a "golden ratio" that applies to all patients regardless of ethnicity. We studied 15 subjects of 3 different ethnicities and photographic measurements were done. Specificities related to the ethnic heritage were found and discussed for each studied group. However there was observed that for all subjects there was significant differences between their appearance and the ideal golden ratio.

Keywords: Facial analysis, ethnic differences, golden ratio, facial aesthetics, proportions.

INTRODUCTION

The term "golden number" was pattened in 1932 by Matila Ghyka (1), but it has existed since ancient Greece. At that time it wass the culmination of mathematics and geometry. People looked for beauty and perfection that went through calculations as specified by Pythagoras "everything is arranged by the numbers" (2)

It is Euclid, in The Elements of Geometry, which demonstrates the existence of a mathematical relation. It is designated by the Greek letter φ in tribute to the Greek sculptor Phidias (born around 490 and died around 430 BC) who decorated the Parthenon in Athens. Ever since then, we define the golden ratio as:

Two strictly positive lengths a and b respect the "proportion of gold" if and only if, the ratio of a on b is equal to the ratio of b on a+b: a / b = b/(a+b)

A ratio of 1.618 is obtained if a = 0.618 and b = 1 (2).

This proportion is close to a proportion used in architecture on 5/8 ≈ 0.625.

There are many applications of the golden ratio, especially in painting, music, science, architecture, economics. But this proportion is found mostly in nature.

In the pine cone, there are spirals whose proportion is close to that of Euclid. The number of scales in a spiral as well as the number of spirals corresponds to two consecutive numbers in the Fibonacci string progression.

The golden ratio is also used in medicine and cosmetic dentistry. The human body is subject to the golden ratio; if we divide the total height of the body by the height of the navel-feet, the total is, or should be, equal to the number of gold. Studies have shown that, if on a template a face is made with the proportions of the golden ratio, then it is applied to mannequin photos and then to photos of person without particular beauty, the faces of the models correspond much more to golden ratio template than others. This is the case of the analysis of Dr. Pfulg on the face of the British model Kate Moss (3). He used the proportions established by da Vinci. The face is divided into three equal stages/ thirds. The distance between the base of the nose and the cleft lip is half of the distance between the cleft lip and the tip of the chin. It also takes into account the inclination of the eyes, he calls "eyes of a star" those who are tilted upwards. (4,5)

Nowadays we find ourselves comforted with strong aesthetic demand from the patients: whiter teeth, changes of the shape of the teeth, alignment of the teeth, modification of the smile.

We must take into account not only their individual expectations but also the differences related to ethnic, physiological and socio-cultural variations.

Each human being is defined by a set of facial elements that depend on the morphology of the bones of the face, the organization of the musculo-adipose tissue and the appearance of its teguments.

Aim and objectives

Our intention here is to see if there are specificities related to each ethnic group and how can it guide us in our daily practice to best meet them.

We wish to verify several hypotheses:

1st hypothesis: are there variations specific to each ethnic group and what are they?

2nd hypothesis: does the golden ratio apply in facial aesthetics and which ethnicity approaches it the most?

MATERIAL AND METHODS

Subjects

We chose as subjects of our study first and second year students from the Faculty of Dental Medicine in Cluj-Napoca, Romania, students of foreign origin, having Caucasian, African or Asian descent.

Exclusion criteria:

- subjects of other ethnicities than Caucasian, African or Asian
- subjects with facial changes such as scars, facial malformations, tattoos, piercings

Inclusion criteria:

- Subjects with ethnicities targeted for the study
- subjects without modification of the facial features

For this pilot study purposes, and in order to establish a work model, a number of fifteen subjects was chosen to carry out the measurements distributed as follows:

- five Caucasian subjects
- five African subjects
- five Asian subjects

B- Used equipment

1. Camera

In order to take photographs of the subjects, we used a Nikon digital SLR camera. This is the Nikon D600 equipped with a NIKKOR AF-S lens of 18-105 mm with a f / 3.5-5.6 focal length. (Figure 1)

Figure 1. The camera that was used for photographic records

2. Flash Light

We used a flash external to the camera used for photographic studios. This is the flashlight D Lite Rx-2 of the brand Elinchrom.

3. Umbrella

We used umbrellas to diffuse the light. The umbrellas used are D-Lite Rx-4 from the Elinchrom brand.

A- Taking pictures for the study

The photo sessions took place in the photographic laboratory of the department of dental propaeutics of the Faculty of Dentistry, in Cluj-Napoca

For each subject, a series of four photographs were taken:

- A frontal photo in the rest position
- A photo of each right and left profile
- A frontal photo with a natural smile

The subjects were sitting, standing upright, chin parallel to the floor. The photographs were taken in portrait mode at a distance of two meters from the subject. The settings were made in automatic mode. It was used only natural light.

The subjects completed a consent form for the dissemination and use of the photos. Each form has been made in duplicate.

Measurments

The measurements were made after printing the photographs on A4 paper in landscape mode. They were not on a real scale. The measurements were made using a ruler and noted in millimeters (mm) and using a protractor, the angles were noted in degrees.

The line measurements obtained are not to scale but only have a statistical value for proportions.

RESULTS

In the first part we will see the results specific to each ethnic group and then compare them to each other.

In a second part we will study the golden proportions and we will see if they can apply to the human face.

The average measurements that were obtained for the three ethnic groups can be seen in Table 1.

Table 1. Average results for the measurements that were performed on photographs

AVERAGE MEASURMENTS	CAUCASIANS	AFRICANS	ASIANS
RIGHT EYE	15,4	14,2	13,8
LEFT EYE	14,8	14	15
EYES (AVERAGE)	15,1	14,1	14,4
ROOT OF THE NOSE	8	8,6	6,4
HEIGHT OF THE NOSE	13,8	16,8	13
WIDTH OF THE NOSE	16	19,8	19
WIDTH OF THE MOUTH	24,2	23,6	24,6
HEIGHT OF MOUTH (LIPS)	6,8	10,6	8,2
FACIAL HEIGHT TR-GN	83,8	89	85,6
FACIALE LENGTH (OPH-GN)	59	54,4	58,2
UPPER THIRD HEIGHT	26,8	29,8	28,4
MIDDLE THIRD HEIGHT	28	29,6	25,8
LOWER THIRD HEIGHT	28	31,2	31,8
WIDTH OF SMILE	30,6	29,2	30,2
HEIGHT OF SMILE	9,4	12,4	12,6
NASAL-FRONTAL ANGLE	136,4°	131,6°	127,6°
NASO-LABIAL ANGLE	103,2°	103,2°	94,4°
ANGLE OF FACIAL CONVEXITY	139,6°	146,2°	150,8°

The facial features encountered in Caucasian subjects were:

- The facial thirds are of equal proportions
- Thin Lips
- A naso-labial angle within the norms
- A naso-frontal angle slightly above average
- A small angle of facial convexity
- A dominant straight profile
- A dominant euriprosopic facial type

The facial features encountered in African subjects were:

- A long face, less wide
- A predominance of the lower floor
- Thick lips
- An increased width of the nose
- An acute nasolabial angle

- A naso-frontal angle in the average
- A large facial angle of convexity
- The convex profile is dominant
- A dominant leptoprosopic facial type

The facial features encountered in Asian subjects were:

- Thin lips
- A predominance of the lower third and a smaller middle third
- An acute nasolabial angle
- A naso-frontal angle smaller than the average
- A large facial angle of convexity
- The convex profile is dominant

Figure 2 shows variations of facial profile between the three ethnicities, while figure 3 shows variations in the facial type.

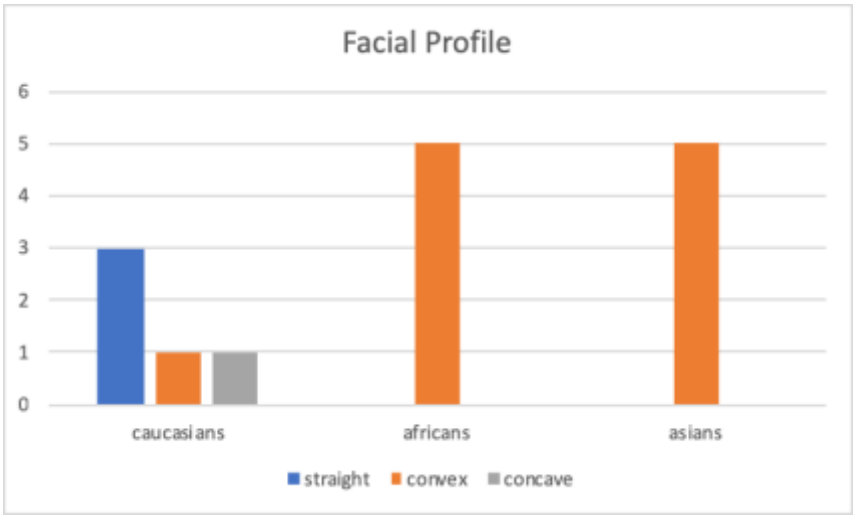

Figure 2. Facial Profile Variations

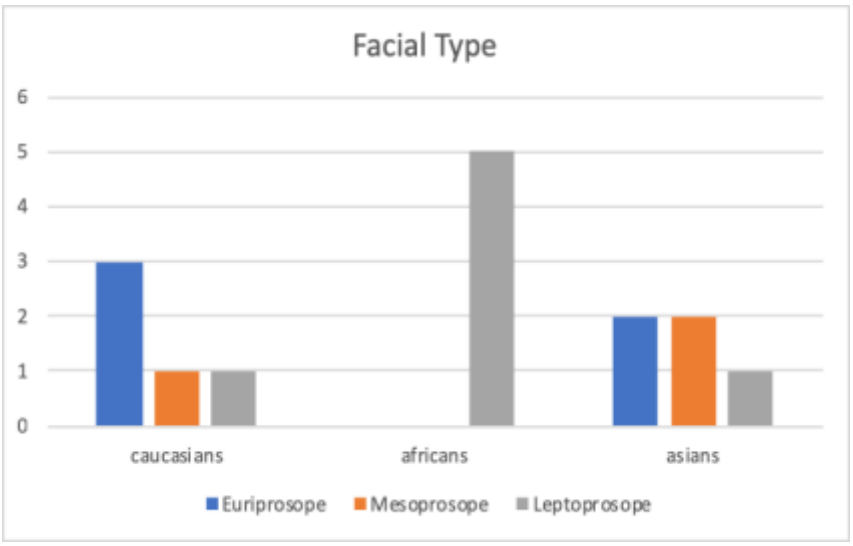

Figure 3. Facial Type variations

According to our study, we can notice that:

- Caucasians have larger eye clefts than other ethnic groups, 6% and 4.6% larger, respectively, than Africans and Asians.

- Africans have a wider mouth compared to Caucasians and Asians. Asians get the smallest measures 20% less than Caucasians.
- The largest width of nose was obtained among Africans 43.5% greater than that of Caucasians. There is no significant difference between Asians and Africans.
- Africans have a thicker mouth, 56% larger than Caucasians and 23% more than Asians.
- Africans and Asians have a longer face than Caucasians with a predominance of the lower floor, respectively larger than 11.4 and 13.6%.
- Caucasians have a larger naso-frontal angle of 3.5% and 5.2% respectively compared to Africans and Asians.
- Africans and Asians have a more closed naso-labial angle than Caucasians.
- The angle of facial convexity is greater among Asians and Afriacans.
- A predominance of the convex profile among Africans and Asians.
- A predominantly Caucasian facial Euriprosope type and a leptoprosopic facial type predominant in Africans.
- No predominance of facial type in Asians.

Study of the Golden Proportions

In this second part we will try to see if the golden ratio applies to the study of the face.

We chose to study the following reports:

- Height of the nasal pyramid on the root of the nose.
- Distance between the wing points and the distance between the mouth commissures in the rest position.
- Height of the lower lip and height of the upper lip.
- Height of the filtrum and total height of the lips.
- Distance between the trichion and the bipupillary line and the distance between the bipupillary line and the gnation
- Diastance between the wing point and the plane of contact of the lips and distance between the plane of contact of the lips and the gnation.
- Distance between the entocochion and the stomion and the distance between the stomion and the gnation.

The proportions can be seen in Figure 4.

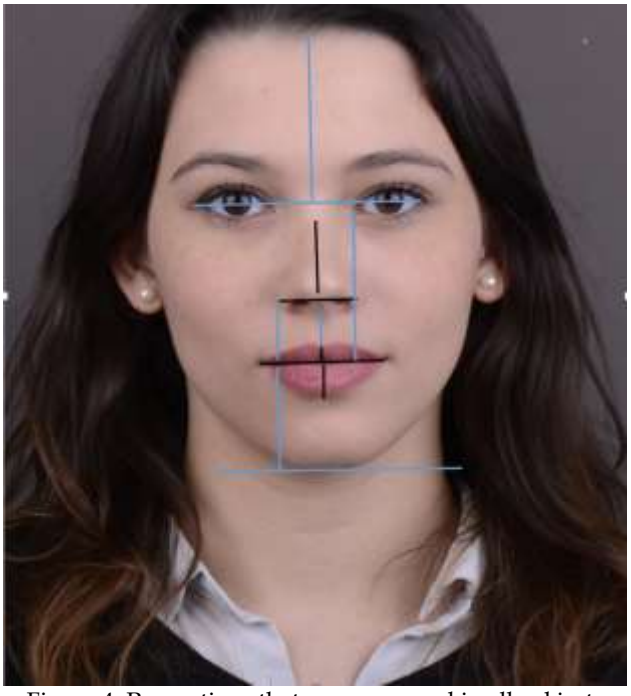

Figure 4. Proportions that were assessed in all subjects

For the Caucasian group we observed that no subjects obtain values in accordance with the golden ratio. On average, a difference of at least 11% is obtained between the number of gold and the measurements made in the subjects.

We also noted that no African subject obtains values equal to the Golden Ratio. On average, there is a difference of 16.9% between the measured values and the Golden Number.

We note that no subject of the Asian ethnic group obtains values equal to the Golden Number. On average, there is a 19.8% difference between the measured values and the Golden Number.

DISCUSSIONS

The results we obtained are not conclusive because of the small sample size studied, five subjects for each ethnic group. To assess our results we tried to compare them to other studies done on the same subject.

Numerous studies have been conducted on the subject but there are few that compare a studied ethnicity with the Caucasian ethnicity as a reference (5-8)

For the African ethnic group, our results are similar to the results obtained in other studies (9-11). African subjects have a convex profile, a larger nose and an acute nasolabial angle.

For the Asian ethnic group, the studies differentiate the geographical origin as China, Japan and Korea (5,6,12,13,14), we were unable to do so in our study due to the mixed nature of the subjects, so that Asians have a less convex profile than Caucasians, which is not the case in our study. Acute nasolabial and more protrusive lips, these two pieces of information find an echo with our study.

The studies are made on samples larger than ours from 40 to 207 which makes them difficult to compare with ours. It would also have been necessary to take into consideration other measurement criteria for aesthetic analysis.

Regarding the application of the golden ratio in the facial aesthetics. Our study focused on a small number of studied segments which makes our study conclusive. Nevertheless none of our subjects studied had an exact match with the golden ratio. The studies found in the literature on the subject confirm these results. Thus in the study Arezoo Jahanbin, Mohammad Basafa and Yekta Alizadeh (15) who assesses the presence of golden ratio in the facial aesthetics of young Iranian women show that none of these young women have the proportions of gold but that the measurements made are approaching 1,618. Similarly, Dr. PFULG 6 on his study of model Kate Moss indicates that she has a face close to divine propotions with variations of to 2mm. (3)

CONCLUSIONS

This work was carried out in order to demonstrate that there are differences between different ethnic groups and whether golden proportions are applicable in stomatological practice.

We have been able to show that yes there are differences between Caucasians, Africans and Asians but that there are also similarities between them. This evidence is intended to help us in our daily practice in the aesthetic care of our patients to best meet their expectations.

We have also demonstrated that the proportions of gold are not applicable in facial esthetics but that an approximation is possible to achieve at best esthetic restorations.

The appreciation of each other's differences is important, but the existence of a framework allows us to best meet the demands of our patients.

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Attitudes and behaviuors during pregnancy and its implications in oral health

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Abstract

Pregnancy is a dynamic state leading to several physiological transient changes in the body system including the oral cavity. The aim of this study was to assess pregnant women's knowledge on oral hygiene practices and maintenance of oral health and to educate them to maintain good oral health behaviours to avoid later complications in the oral cavity or even to the fetus. Pregnant women and their providers need more knowledge about the many changes that occur in the oral cavity during pregnancy. In is import to recognize, prevent and treat oral health problems in pregnant women.

Keywords: oral health, pregnancy, women's health care.

INTRODUCTION

Pregnancy is a dynamical and physiological state of female individuals and a natural process of humans. Due to this dynamical period many physiological changes are observed in various body systems like for instance in blood chemistry, the cardiovascular system, the respiratory system and the gastrointestinal system. These include also changes in the oral cavity. By looking further to a distinct aspect of the alterations in the oral cavity it is remarkably seen that diverse pathological conditions do occur due to hormonal changes or dietary modifications.

Gingival hyperplasia, gingivitis, pyogenic granulomas and various salivary alterations are common pregnancy-related oral pathologies [1]. Previously existing oral-dental problems might aggravate as well. Reduced salivary flow leads to pH changes causing a more acidic environment in the oral cavity, which in turn triggers the evolution of decay [2].

Pregnancy is characterized by an increased prevalence of caries due to the increased consumption of sugary diet and carbohydrate enriched food intake. Due to the nutritional changes and lesser attention to oral health, coinciding with a drop in salivary pH and buffer effect, caryogenic microorganisms are increased and invented to the tooth structure.

Furthermore, the so called morning sickness meaning recurrent vomiting usually during the second to fourth months of pregnancy enhances acidic environment causing increased demineralization of tooth structure and making it more prone to caries. More severe are the consequences of untreated carious lesion which might lead to abscesses and cellulitis.

Despite the insufficient self-maintenance of oral hygiene measurements during pregnancy other impediments like the lack of knowledge, incorrect assumptions and negative experiences leads the pregnant woman to a reserved and hesitant behavior against dental practitioners [3].

Therefore in pregnancy oral health measurements should be of higher importance and oral health promotions, educational programs, disease prevention and early timing of interventions should be more emphasized. Also the interdisciplinary collaboration between the gynecologist and dental care professionals will approve and enhance health services referral strategies [4].

Aim and objectives

The aim of this study was to describe self-reported oral health, oral hygiene habits, frequency of visits to a dentist and factors associated with dental attendance among pregnant women attending an obstetric praxis in Germany, the majority of whom are immigrants.

MATERIALS AND METHODS

A prospective clinical study was carried out on 50 pregnant patients in the private gynecologic and obstetric praxis in Duisburg, Germany during the period of 21rst of November 2016 until the 15th of December 2016.

50 participants received a questionnaire containing 20 personal questions about their oral hygiene and frequent consumption oral hygiene products as well as their frequent visit at a dental office and general information about their knowledge concerning this topic.

There was no specific age selection of the participant, furthermore the main criteria was a pregnant participant.

Inclusion criteria:

I. Oral findings: The participant should not have a complete denture restoration without any natural teeth, should not have orthodontic appliances and the patient should at least have 20 natural teeth without prosthetic appliances.

II. General Health Condition: the participant should be in gestational period, should be in a healthy and stable gestational period and should not have any systemic disease which can trigger his general oral health condition.

III. Others: the participant should be in healthy psychological condition to participate in this study, should be in healthy physiological condition which does not hinder or alter her from maintaining her oral hygiene measurements and should understand the language which the questionnaire is made of.

The duration of the study was 25 days. The participants were questioned and examined approximately 20-30 minutes before and after they were seeking their gynecological treatment. The examination was done in a separate room in the gynecological praxis with good lightening and a patient bed and patient chair.

One week before the clinical study an information sheet was handed out in the praxis to inform the patient about the content and importance of the study. The participation of this study was voluntarily and anonymous and the patients were free to cancel any time this clinical examination and questionnaires in case of discomfort or any other reasons. Questionnaires were made in the local language which means in German language and in case of foreign participants a local translator or an assistant of the praxis who was able to translate was assisting. A written declaration of consent was obtained by the leading gynecologist.

All the participants received the questionnaire with the 20 questions and were allowed to read it and to decided once again if they want to participate in this study or not. After their agreement all the questions were asked one by one and elaborated together. All the information from the patients was considered as important and noted down. The questionnaires can be divided into several parts. The first part was the general information about the patient's data, age, gestational period, original background and educational status.

The second part of this questionnaire included information about the time interval of their dental visits and their awareness and importance of visiting their dentists during pregnancy. Another consequential part was their oral hygiene measurement for example how often they brush their teeth and in case of a deficit or lack in oral hygiene activity the reason was trying to be established.

Also which type of dental hygiene products, and which type of tooth brushes regarding the manual and electrical ones were asked in detail. The sequence of changing all of these dental hygiene products were asked as well. The third part of the questionnaire was more related to their general food intake especially sugary or carbohydrate rich food consumption.

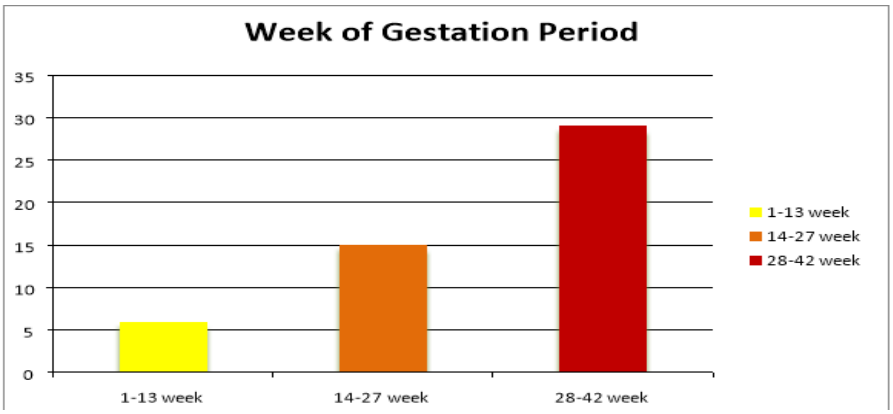
Alcohol, smoking and drug use were as well questioned since these conditions can influence the general health of the pregnant women and its fetus as well as its oral health status.

The fourth part was assessing the gingival and periodontal health status before and after pregnancy and if the participant noticed any negative alterations about his gingival health, recurrent bleeding and or even their general oral health changes during the period of gestation. Furthermore questioning about their genetics and occurrence of periodontal health problems related to their families was giving and important hint. Finally the last aspect and the most outstanding topic was the assessment of their general knowledge regarding their own oral hygiene measurements and its impact to their babies during the gestational period and even after birth.

After the questionnaire was finished all the participants were informed about prevention programs and the importance of oral hygiene measurements especially during pregnancy. It was emphasized that pregnancy is not a contraindication for regular and preventive dental visits. Any other questions by the participants were answered also in detail and were advised to continue and conduct their general dental practitioner.

RESULTS AND DISCUSSIONS

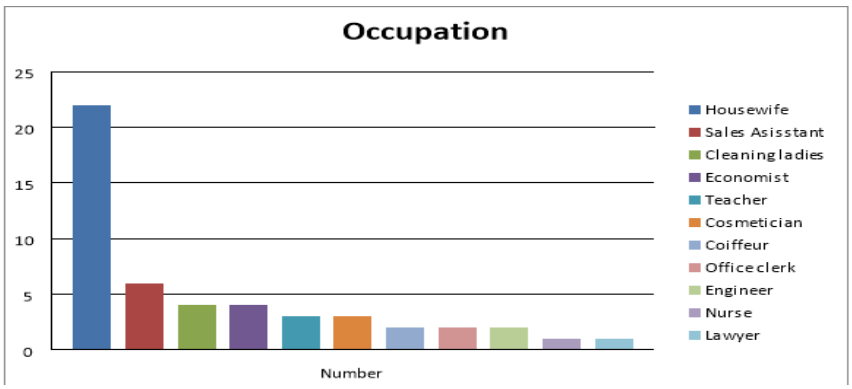
50 participants were involved in this study and are categorized into age groups as follows: the first age group starts from 19 to 24 years old, the second group starts from 25 to 29 years old and the third group continues from 30 to 34 years old and the fourth and last group age starting from 35 up to the age of 39 years old. The youngest participant was 18 years old and the oldest participant was 36 years old. The average age of the samples was 25.1 years old. Regarding this study the distribution between the first three group ages were mainly equal. 32% of the participants, belonging to the first age group, 30% belonging to the second age group, while 32% to the third. The minority of participants belongs to the fourth group by a number of 6%.



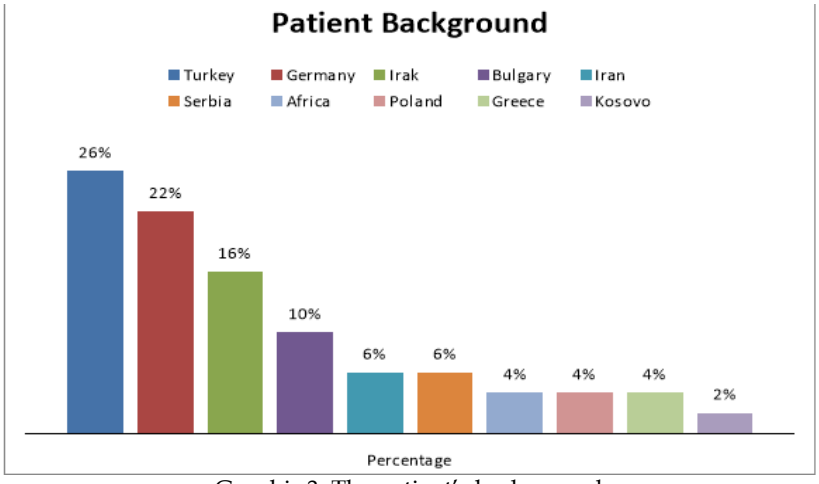
Graphic 1. Week of gestation

The earliest gestational period was a participant in the 12th week and the latest period of gestation of the probate was 39th week (graphic 1). In average period of gestation was 26.1 week of a fetus.

All participants were subdivided into trimesters because every trimester has a significance role especially in hormonal secretion and imbalance. Normally starting from the day of fertilization up to the imminent delivery the period of delivery is calculated in weeks, more precisely laps of 42 weeks. The first trimester covers the 1st up to the 13th weeks, whereas the second trimester the 14th op to the 27th week. The third trimester is including week 28th up to 42nd. In this study, 12 % of the participants were in the first trimester and 30 % in the second. The majority of the participants were in the last trimester During this study the occupational or educational status of every woman was examined and encountered as an important factor of their attitude and knowledge of dental health care. According to this study it can be seen that the ratio between unemployed and employed women was almost 50% in each group (graphic 2). Furthermore there is also a subdivision between academic and non academic employee.

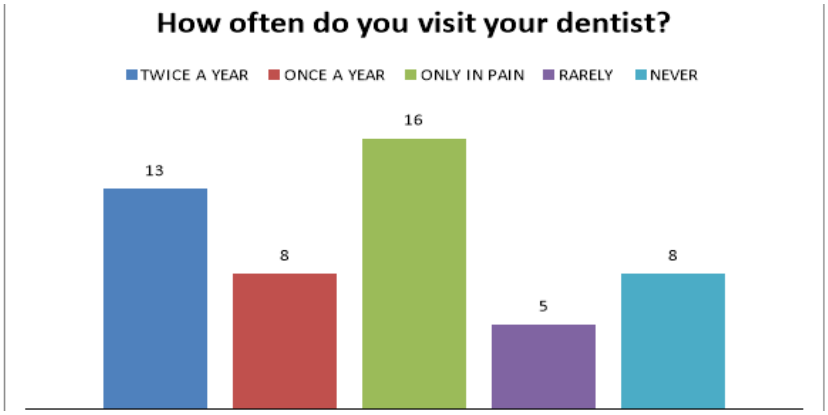


Graphic 2. Occupation of the women included in the study



Graphic 3. The patient's background

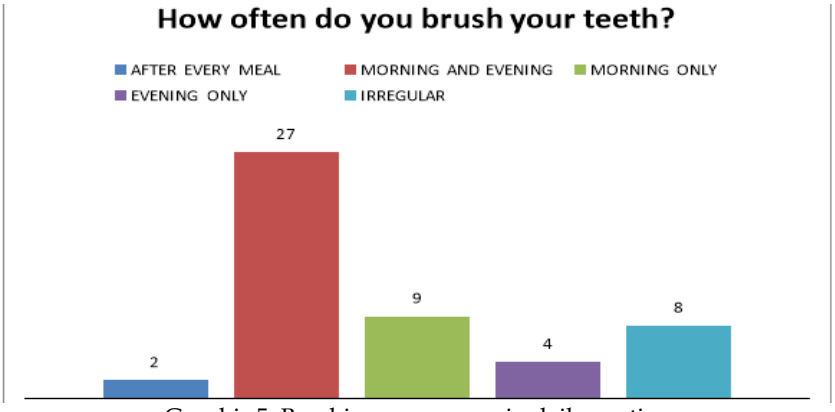
A multicultural group of patients were seeking treatment in this praxis. In total 9 different nationalities. Only 22% of the patients were native Germans the rest of the women were from different countries (graphic 3).



Graphic 4. Representation of dental visits frequency

While analysing the dental visits of each participants a high number meaning 32% of the participants were just visiting the dentist in the presence of pain, while 26% were going continuously for routine dental check-ups every six months. 16 % are visiting the dentist once a year or they have never been to a dentist before. Only 10% of the patients visit the dentist rarely (graphic 4).

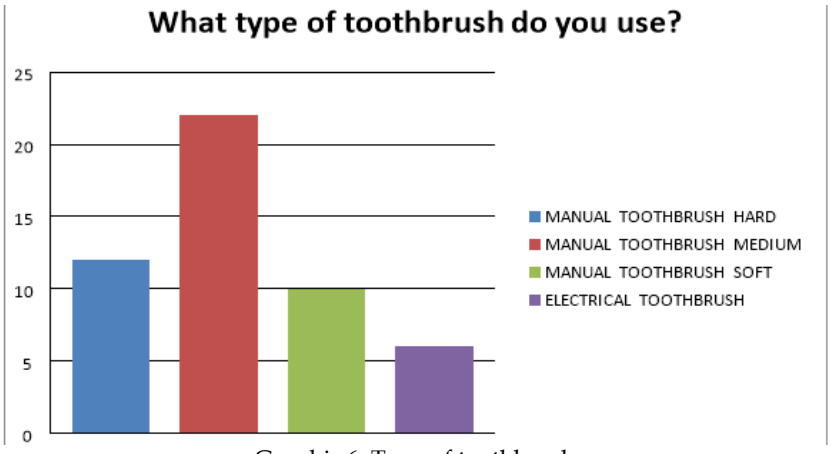
In questioning the patients about their dental visits during their period of pregnancy only 24% of the women had a visit at the dentist. The main cause of the visit was either prophylactic treatment or due to pain. The majority by 76% did not have any dental visits during this period.



Graphic 5. Brushing occurrence in daily routine

More than the half of the women, by 54%, are brushing their teeth twice daily in the morning and evening. 18% are brushing only in the morning and 16% irregular.

Brushing only in the evening is performed only by 8% and minority of 4 % is brushing after every meal (graphic 5).

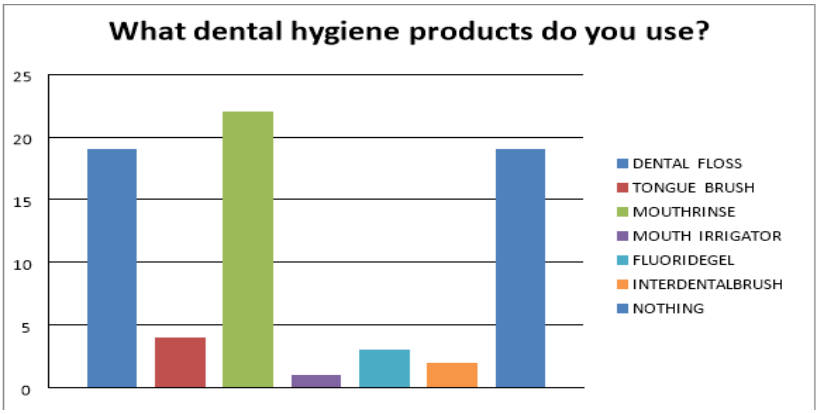


Graphic 6. Type of toothbrush

In determining the type of toothbrush which is used by the pregnant women a salient number was using a manual toothbrush in comparison to an electrical toothbrush. In detail, 88% were using a manual toothbrush from which 44% are utilizing a medium bristle toothbrush, 24% a hard bristle and 20 % a soft bristle toothbrush. Only 12% were utilizing an electrical toothbrush (graphic 6).

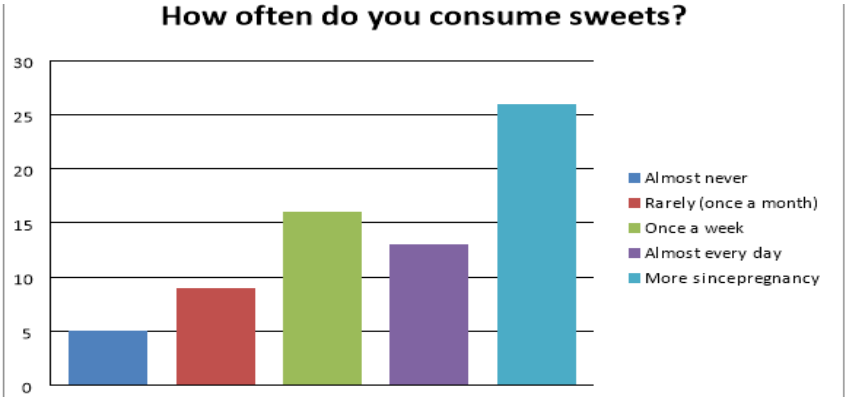
Most of the pregnant women are changing their toothbrush every 2-3 months, 78%.

14% is changing every 6 months, 6% only when unusable and the minority by 2 % only once a year.



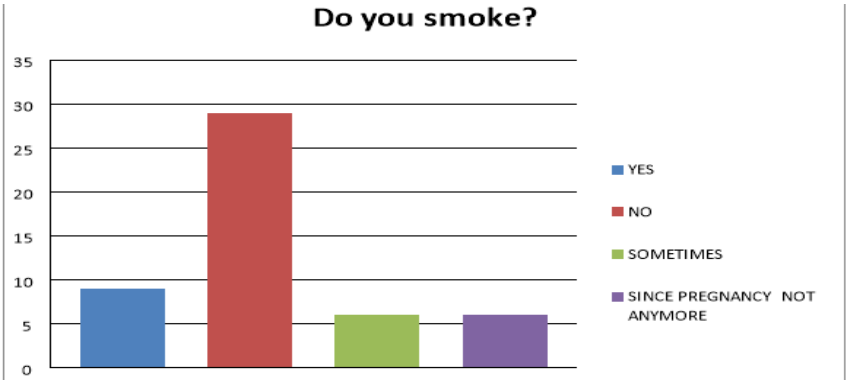
Graphic 7. Dental hygiene products

44% of the women are using mouth rinses and a quite similar number by 38% is using dental floss. Another 38 % is using neither of the listed dental hygiene products except the toothpaste.The tongue brush was utilized by 8% of the women, the application of fluoride gel by 6% and the inter-dental brushes by 4%. A small number calculated by 2 % is using a mouth irrigator (graphic 7).



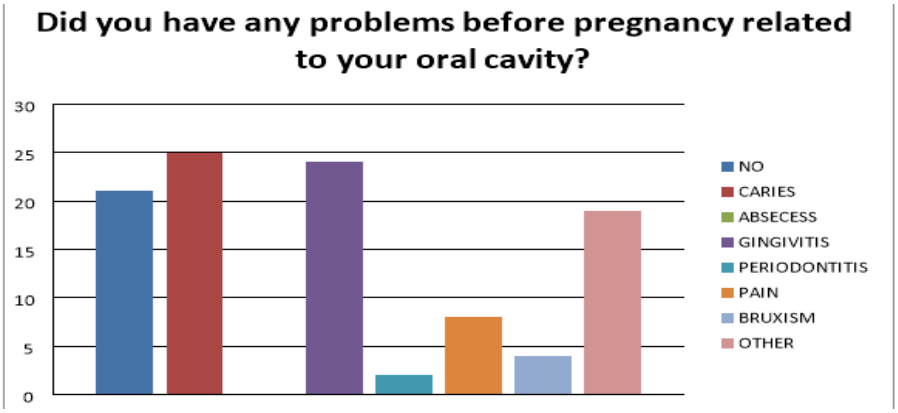
Graphic 8. The approximation of how often they consume sweets

By observing the consumption of sweets more than the half of the participants are stating the increased consumption of sweets since pregnancy, 52%. 32% are consuming only once a week, 26 % almost every day, 8% rarely and only 10% never consume sweets (graphic 8).



Graphic 9. How many women smoke and how many not, or at all since pregnancy

More than the half of the women are non-smokers by 58%. In contrast, 18% are smokers and 12 % of the women are occasional smokers. 12% stopped smoking since pregnancy (graphic 9). Furthermore all participants were stating not consuming alcohol or drugs.



Graphic 10. Dental problems anterior pregnancy

The majority of the women were observing a worsening of the initial pathological condition which occurred before pregnancy by 64% (graphic 10). 34% did not observe any changes or worsening of a pathological condition. The most common dental problem is gingivitis in 50% of the cases. Secondary was caries (25%) and herpex simplex in 9,375%. Erosions by 6, 25%., and periodontitis by 6, 25%. The third molar extrusion was in 3,125% cases. In case of bleeding the 50% of the pregnant women are continuing to brush gently, 44% is stopping to brush and 3% has a vigorously brushing habit towards bleeding gums. None of the women are seeking a dentist in this particular case. Existing hereditary gingivitis were answered in 62% of the cases negative, and in 38% positive. 62% of the pregnant women are not aware of the transmission of bacteria to their babies through pacifiers. Only 38% are aware to this condition.

DISCUSSIONS

During this study many factors were taken into consideration and were analyzed regarding several categories: demographic, socioeconomic, psychological, behavioral and perceived needs in evaluating oral health during pregnancy.

Demographic factors are including the patient's age, language / nationality and ethnicity. Most of the female patients are from different nationalities. Only 22% were native Germans and a higher number of patients were from Turkey (26%) followed by Iraqis around 16% and other nationalities. A minor group of Sinti and Roma from Bulgaria and Serbia were a part of the patient. Nevertheless it was observed that many women were less informed and educated since in their own childhood in their native country was a lack of information and oral health was neglected. Also it was observed that younger pregnant women were more attentive and educated regarding oral health and prevention compared to the secondary age group.

It was stated that only 26% of the women are regularly going for dental health care twice yearly while 32% in seeking a dentist only in case of pain. 16% only once a year and another 16% never had been to a dentist before. More specifically refuge Iraqis was fulfilling this percentage.

Albujer and Taher are stating in their study that there is a shortage in the Middle Dental Stuffs for example dental nurses, hygienist, dental technicians and even dental prevention programs which is a major problem in Iraq which could explain the difficulty of accessibility [5].

Dental visits and attending dental health prevention programs become even worse in pregnant women and 76% of the patients were stating that they did not visit their dentist since pregnancy because they were misinformed and considered dental visits and even prophylactic treatments as harmful and risky during the gestational period [6,7].

For this reason it is very important that their health care providers like gynecologist, midwifes and nurses inform and motivate these women to perceive prophylactic dental treatment for them and their babies' health and that the most of the dental treatment is even safe during this period [8.,9]. It was stating in their study that many health care professionals were conscious about the importance of oral health, but often do not address their patients because they consider these aspect not to be a part of their assignment. Hashim and Akbar also mentioned that during a survey 85.2% of the gynecologist was aware about the coherence between oral health and pregnancy and that only 85.2% advised dental visits for their patients.

Socioeconomic factors are encompassing the income, educational level and health insurance. According to this study it was seen that the ratio between unemployed and employed women was almost 50% in each group. Furthermore in subdividing the employed group in academic and non academic, it was observed that the academic women had more

knowledge and a better oral health. Women who had at least 12 years of schooling had significantly higher odds of receiving dental cleaning during pregnancy [10].

Frequently dental treatments are private achievements in many countries and are associated with high fees which might be a reason why only the minorities of pregnant women can seek dental care but this condition is not valid in Germany. The German national health insurance (NHI) is covering all preventive dental treatments in pregnant women [11].

An important aspect which should be also emphasized is the psychological and behavioural issue. More than the half of the women, by 54%, are brushing their teeth twice daily in the morning and evening. 18% are brushing only in the morning and 16% irregular. Brushing only in the evening is performed only by 8% and minority of 4 % is brushing after every meal. In other studies performed on pregnant women the majority reported good oral hygiene habits such as brushing their teeth twice a day (73.7%) and using mouthwash (51%) [12].

By observing furthermore and searching for the causes of non-brushing habit of the pregnant woman, the most outstanding reason was the morning sickness and sensitivity of vomiting in case of brushing and the taste of toothpaste. Another mentioned cause was oblivion and laziness. In determining the type of toothbrush which is used by the pregnant women a salient number was using a manual toothbrush in comparison to an electrical toothbrush.

About the type bristle and their effects most of the women were not aware.

In detail, 88% were using a manual toothbrush from which 44% are utilizing a medium bristle toothbrush, 24% a hard bristle and 20 % a soft bristle toothbrush. Only 12% were utilizing an electrical toothbrush. A study of Cochrane Oral Health Group, in association out 50 Dentist and scientists from several countries over a time period of 40 years and more than 55 studies were pursuing the questions where an electrical toothbrush is more effective than a hand brush.

Not only the effectiveness of removing plaque and the bio-film was made but also the effectiveness of the decrease of gingivitis was encountered and analyzed.

The study manifested that the electrical toothbrush compared to a manual toothbrush removed around 21% more bacterial plaque and that the amount of gingivitis and periodontitis decreased around 11% [13,14].

Due to this condition the use of an electrical toothbrush is more advisable because of its ease of use and good effective especially in pregnant women with an oblivion and indolent behavior.

Nevertheless the responses about the renewal of a toothbrush were about 78% in changing it ever 2-3 months. 14% is changing every 6 months, 6% when she considers being unusable and only 2% once a year.

In comparison to this positive feedback the usage about dental hygiene products was less satisfying. In this study the usage of dental hygiene products by each participant is giving us significant information about their attitude towards oral health and especially further information of the existing pathological condition. Multiple possible answers were evaluated and noted. 44% of the women are using mouth rinses and a quite similar number by 38% is using dental floss. Another 38 % is using none of the listed dental hygiene products except the toothpaste. The tongue brush was utilized by 8% of the women, the application of fluoride gel by 6% and the inter-dental brushes by 4%. A small number calculated by 2 % is using a mouth irrigator.

It was outstanding that the importance of using a dental floss daily was very unclear to most of the women.

CONCLUSIONS

The interdisciplinary collaboration between dental health professionals, gynecologist, midwifes and general physicians about oral health care is pivotal. For this not only the dentist but also the other health care professionals should participate in oral health programs in order to be a become a good source for oral health education. This interdisciplinary correlation will provide an access of good quality information and appear to the have positive behavioral factor of the pregnant women.

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Sagittal and vertical cephalometric analysis in adult Caucasians from western Romania with skeletal Class I and Class II malocclusion

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Abstract

Aim: The aim of our cephalometric study was to emphasize the characteristics and sexual dimorphism within the local western Romanian Caucasian adult population, regarding the vertical and sagittal relationships in skeletal Class I and skeletal Class II malocclusion.

Material and methods: We analysed 73 lateral cephalometric radiographs from orthodontic adult patients (37 females and 45 males), aged 18 to 34 years. For each case we made angular measurements (SNA, SNB and ANB angles), linear measurements (total anterior facial height - TAFH, upper anterior facial height - UAFH, lower anterior facial height - LAFH, total posterior facial height TPFH) and calculated the ratios between these vertical measurements.

Results and conclusions: Regarding the sexual dimorphism, statistically significant differences were found in skeletal Class I group with higher values for the male subjects in SNB angle, TAFH, UAFH, LAFH, TPFH and the ratio TPFH/TAFH. In Class II group the males had higher values than females for TAFH, UAFH and TPFH. Statistically significant differences were found in the female group between the two skeletal classes in TAFH and LAFH, both having lower values in skeletal Class I than in skeletal Class II.

Keywords: skeletal pattern, sexual dimorphism, cephalometric analysis, facial height.

INTRODUCTION

In orthodontics, balanced vertical proportions play an important role in achieving optimal facial aesthetics [1]. In order to assess the variations in the vertical plane that may occur along with the changes in the sagittal plane, cephalometric analysis proves to be a valuable complementary examination. Several measurements were proposed to analyse the vertical skeletal pattern: the total anterior facial height (TAFH) comprised of the upper anterior facial height (UAFH) and the lower anterior facial height (LAFH), as well the total posterior facial height (TPFH).

It is well known that in diagnosing dento-maxillary anomalies and making informed treatment planning decisions, in order to achieve "optimal" aesthetics we also have to address the racial and ethnic background of the patient [2].

The facial and cranial characteristics of an individual can significantly vary not only from other individuals from different ethnic or racial groups, but even from individuals within the same ethnic or racial group [3,4].

Aim and objectives

Considering the large variations that occur even in subjects with normal occlusion [5], the aim of our cephalometric study was to emphasize the characteristics and sexual dimorphism within the local western Romanian Caucasian adult population, regarding the vertical and sagittal relationships in skeletal Class I and skeletal Class II malocclusion.

MATERIAL AND METHODS

The sample included in our retrospective study consisted of 73 lateral cephalometric radiographs from orthodontic adult patients (37 females and 45 males), aged 18 to 34 years, with skeletal Class I and skeletal Class II malocclusion. The patients were selected from the database in the Department of Orthodontics, Faculty of Dental Medicine, Faculty of Dental Medicine, "Victor Babeş" University of Medicine and Pharmacy and from the private practice of Dr. Bratu Dana Cristina. All the patients signed the informed consent and agreed to participate in medical research. The inclusion criteria were as follows: Romanian Caucasian adult patients from western Romania, without prior orthodontic treatment or orthognathic surgery.

Investigation method

The lateral cephalometric radiographs were taken on a CRANEX 3D Dental Imaging System (Finland, Europe). The head of the patient was oriented according to a horizontal reference plane (plane of Frankfort).

The radiographs were digitally analysed using the specialized software AudaxCeph Advantage, using a custom cephalometric analysis for linear and angular measurements. The cephalometric landmarks used were: N (nasion), Point A, Point B, ANS (anterior nasal spine), Me (menton), S (sella), Ar (articulare) and tGo (constructed gonion). Me (menton) was defined as the lowest point on the mandibular symphysis in the midsagittal plane. Ar (articulare) was defined as the point of intersection between the radiographic contour of the posterior border of the ascending ramus and the outer border of the cranial base. tGo (constructed gonion) was defined as the point of intersection between the mandibular plane (though Me) and the tangent plane to the posterior margin of the ascending ramus (through Ar).

The total anterior facial height (TAFH) was measured as the linear distance in mm, between N and Me. The orthogonal projection of point ANS onto the N-Me line was defined as prANS. The upper anterior facial height (UAFH) was defined as the linear distance in mm

between N and prANS, while the lower anterior facial height (LAFH) was defined as the linear distance in mm between prANS and Me. The total posterior facial height (TPFH) was defined as the linear distance in mm between S and tGo. A template with the linear measurements is illustrated in Figure 1.

We also expressed the following ratios in percentages: UAFH/TAFH, LAFH/TAFH, as well as the TPFH/TAFH, in order to evaluate the vertical variations.

For the assessment of the skeletal pattern of the examined subjects, we used the Steiner's ANB angle (obtained from subtracting the value of SNB angle from the value of SNA angle). The sample was divided in two groups: skeletal Class I (ANB = 2° ± 2°) and skeletal Class II (ANB > 4°). A template with the angular measurements is illustrated in Figure 2.

The measured variables were statistically analysed using specialized software (IBM SPSS, version 24, SPSS Inc., Chicago). Descriptive statistics were generated for the linear and angular measurements. An independent-samples t-test was run to test for differences in the examined variables between males and females, in the skeletal Class I group and Class II group, respectively, as well as the differences between males belonging to different skeletal groups (Class I vs Class II) and females belonging to different skeletal groups (Class I vs Class II). We considered the independent-samples t-test to be statistically significant at $p < .05$.

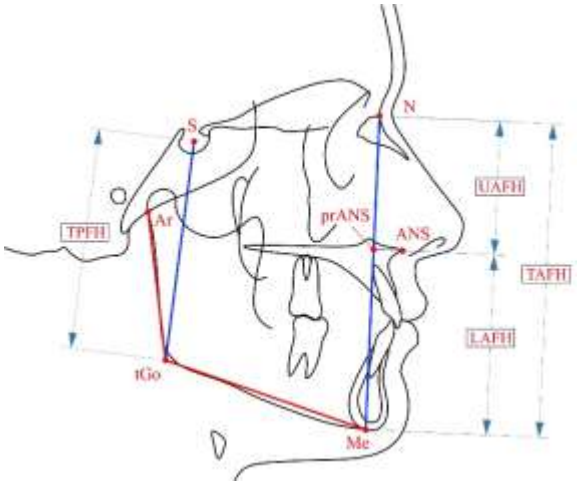

Figure 1. Template illustrating the cephalometric linear measurements: TAFH: N-Me, UAFH: N-prANS, LAFH: prANS-Me, TPFH: S-tGo

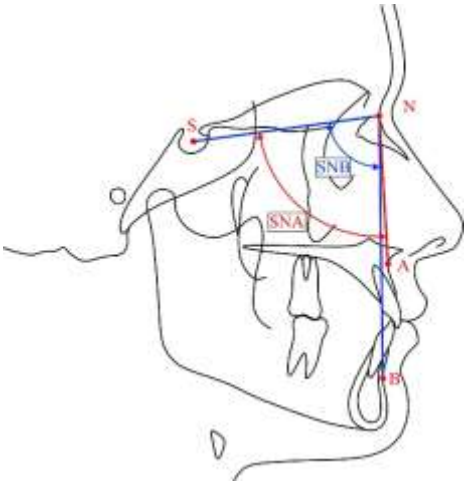

Figure 2. Template illustrating the cephalometric angular measurements SNA and SNB

RESULTS

The sample distribution by age and gender (a total of 37 females and 45 males) in skeletal Class I and skeletal Class II is shown in Figure 3 and 4.

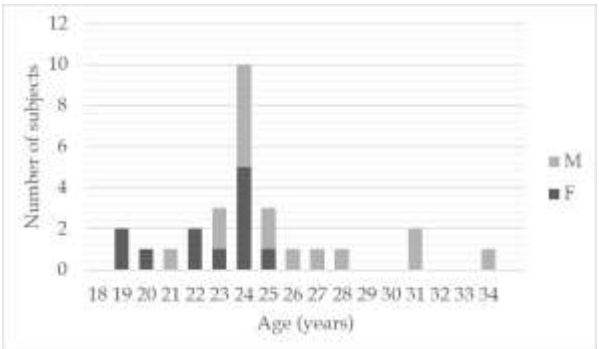

Figure 3. Sample distribution by age and gender in skeletal Class I (M – male; F – female)

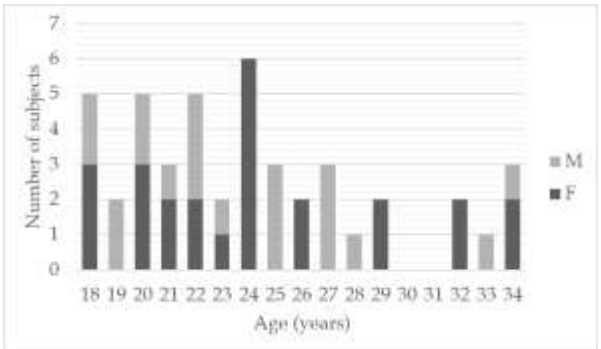

Figure 4. Sample distribution by age and gender in skeletal Class II (M – male; F – female)

The descriptive statistics for the sample are presented in Table 1, along with the results of the independent-samples t-test which was used to determine if there were differences in the examined variables between males and females, in the skeletal Class I group and Class II group, respectively.

Table 1. Comparison of the examined variables between males and females, in the skeletal Class I group and Class II group, respectively and the results of the independent-samples t-test

Variables	Skeletal Class	Male				Female				t-test						
		N	Mean	SD	SEM	N	Mean	SD	SEM	t	df	p	Mean Diff.	SED	95% CI	
															Lower	Upper
SNA (deg.)	I	16	82.63	1.71	0.43	12	81.50	2.32	0.67	1.48	26	.150	1.13	0.76	-0.44	2.69
	II	20	83.15	4.07	0.91	25	82.16	3.50	0.70	0.88	43	.385	0.99	1.13	-1.28	3.26
SNB (deg.)	I	16	80.06	1.65	0.41	12	78.33	2.31	0.67	2.21	19.01	.040*	1.73	0.78	0.09	3.37
	II	20	76.10	3.51	0.78	25	75.56	3.51	0.70	0.51	43	.611	0.54	1.05	-1.58	2.66
ANB (deg.)	I	16	2.50	1.10	0.27	12	3.25	0.75	0.22	-2.03	26	.052	-0.75	0.37	-1.51	0.01
	II	20	7.00	1.92	0.43	25	6.52	1.36	0.27	0.98	43	.332	0.48	0.49	-0.51	1.47
TAFH (mm)	I	16	116.13	4.91	1.23	12	106.67	3.68	1.06	5.59	26	.000***	9.46	1.69	5.98	12.94
	II	20	117.15	6.39	1.43	25	110.52	4.62	0.92	3.90	33.56	.000***	6.63	1.70	3.17	10.09
UAFH (mm)	I	16	51.50	2.50	0.63	12	48.42	2.50	0.72	3.23	26	.003**	3.08	0.96	1.12	5.05
	II	20	52.70	3.56	0.80	25	48.36	2.50	0.50	4.80	43	.000***	4.34	0.90	2.52	6.16
LAFH (mm)	I	16	64.56	5.09	1.27	12	58.42	3.73	1.08	3.53	26	.002**	6.15	1.74	2.57	9.73
	II	20	64.50	4.41	0.99	25	62.28	4.25	0.85	1.71	43	.094	2.22	1.30	-0.39	4.83
TPFH (mm)	I	16	83.56	4.65	1.16	12	71.42	4.38	1.26	7.01	26	.000***	12.15	1.73	8.59	15.71
	II	20	80.55	5.87	1.31	25	72.40	4.81	0.96	5.12	43	.000***	8.15	1.59	4.94	11.36
UAFH/TAFH (%)	I	16	44.38	2.53	0.63	12	45.33	2.42	0.70	-1.01	26	.322	-0.96	0.95	-2.91	0.99
	II	20	45.00	1.92	0.43	25	43.80	2.22	0.44	1.91	43	.062	1.20	0.63	-0.07	2.47
LAFH/TAFH (%)	I	16	55.63	2.53	0.63	12	54.67	2.42	0.70	1.01	26	.322	0.96	0.95	-0.99	2.91
	II	20	55.00	1.92	0.43	25	56.20	2.22	0.44	-1.91	43	.062	-1.20	0.63	-2.47	0.07
TAFH/TPFH (%)	I	16	72.00	4.38	1.10	12	66.83	3.13	0.90	3.47	26	.002**	5.17	1.49	2.10	8.23
	II	20	68.90	5.27	1.18	25	65.64	5.48	1.10	2.02	43	.050	3.26	1.62	0.00	6.52

Deg. – sexagesimal degrees; N – sample number; SD – Std. Deviation; SEM - Std. Error Mean; df – degrees of freedom; Mean Diff. – Mean Difference; SED - Std. Error Difference; 95% CI – 95% Confidence Interval of the Difference; *p <.05; **p <.005; ***p <.0005

The differences between males belonging to different skeletal groups (Class I vs Class II) and females belonging to different skeletal groups (Class I vs Class II) are shown in Table 2.

Table 2. Comparison of the linear measurements of the vertical dimensions between males belonging to different skeletal groups (Class I vs Class II) and females belonging to different skeletal groups (Class I vs Class II) and the results of the independent-samples t-test.

Variables	Gender	t	df	p	Mean Diff.	SED	95% CI	
							Lower	Upper
TAFH (mm)	M	-0.53	34	.601	-1.03	1.94	-4.97	2.92
	F	-2.53	35	.016*	-3.85	1.53	-6.95	-0.76
UAFH (mm)	M	-1.14	34	.262	-1.20	1.05	-3.34	0.94
	F	0.07	35	.949	0.06	0.88	-1.73	1.84
LAFH (mm)	M	0.04	34	.969	0.06	1.58	-3.15	3.28
	F	-2.69	35	.011*	-3.86	1.44	-6.78	-0.95
TPFH (mm)	M	1.67	34	.103	3.01	1.80	-0.65	6.67
	F	-0.60	35	.554	-0.98	1.64	-4.32	2.35
UAFH/TAFH (%)	M	-0.84	34	.405	-0.63	0.74	-2.13	0.88
	F	1.91	35	.064	1.53	0.80	-0.10	3.16
LAFH/TAFH (%)	M	0.84	34	.405	0.63	0.74	-0.88	2.13
	F	-1.91	35	.064	-1.53	0.80	-3.16	0.10
TAFH/TPFH (%)	M	1.89	34	.068	3.10	1.64	-0.24	6.44
	F	0.70	35	.489	1.19	1.71	-2.27	4.66

df – degrees of freedom; Mean Diff. – Mean Difference; SED - Std. Error Difference; 95% CI – 95% Confidence Interval of the Difference; *p <.05

Regarding the sexual dimorphism, statistically significant differences (p <.05) were found in skeletal Class I group in several variables:

- SNB angle had higher values in male subjects (80.06° ± 1.65°) than in female subjects (78.33° ± 2.31°), a statistically significant difference of 1.73 (95% CI, 0.09 to 3.37), $t(19.01) = 2.21$, p =.040.
- TAFH was higher in male subjects (116.13 mm ± 4.91 mm) than in female subjects (106.67 mm ± 3.68 mm), a statistically significant difference of 9.46 (95% CI, 5.98 to 12.94), $t(26) = 5.59$, p <.0005.
- UAFH was higher in male subjects (51.50 mm ± 2.50 mm) than in female subjects (48.42 mm ± 2.50 mm), a statistically significant difference of 3.08 (95% CI, 1.12 to 5.05), $t(26) = 3.23$, p =.003.
- LAFH was higher in male subjects (64.56 mm ± 5.09 mm) than in female subjects (58.42 mm ± 3.73 mm), a statistically significant difference of 6.15 (95% CI, 2.57 to 9.73), $t(26) = 3.53$, p =.002.
- TPFH was higher in male subjects (83.56 mm ± 4.65 mm) than in female subjects (71.42 mm ± 4.38 mm), a statistically significant difference of 12.15 (95% CI, 8.59 to 15.71), $t(26) = 7.01$, p <.0005.
- TAFH/TPFH was higher in male subjects (72.00% ± 4.38%) than in female subjects (66.83% ± 3.13%), a statistically significant difference of 5.17 (95% CI, 2.10 to 8.23), $t(26) = 3.47$, p =.002.

Regarding the sexual dimorphism, statistically significant differences (p<.05) were found in skeletal Class II group in several variables:

- TAFH was higher in male subjects (117.15 mm ± 6.39 mm) than in female subjects (110.52 mm ± 4.62 mm), a statistically significant difference of 6.63 (95% CI, 3.17 to 10.09), $t(33.56) = 3.90$, p <.0005.
- UAFH was higher in male subjects (52.70 mm ± 3.56 mm) than in female subjects (48.36 mm ± 2.50 mm), a statistically significant difference of 4.34 (95% CI, 2.52 to 6.16), $t(43) = 4.80$, p <.0005.
- TPFH was higher in male subjects (80.55 mm ± 5.87 mm) than in female subjects (72.40 mm ± 4.81 mm), a statistically significant difference of 8.15 (95% CI, 4.94 to 11.36), $t(43) = 5.12$, p <.0005.

Comparing the vertical measurements from the male group in skeletal Class I and skeletal Class II there were no statistically significant differences between the two skeletal classes. The only statistically significant differences (p < 0.05) were found in the female group between the two skeletal classes in TAFH and LAFH, both having lower values in skeletal Class I than in skeletal Class II.

DISCUSSIONS

Analysing the results in our study, we found that sexual dimorphism was present in the examined sample, especially in skeletal Class I group, where most of the vertical measurements had higher values in males than in females.

Similar results were reported in different ethnic and racial groups. In a sample group from an Indian population [6] and in another group from Sudan [7], the authors reported that the upper and lower anterior facial height had higher values in males [6,7]. On the contrary, other studies conducted on Nigerian patients [8–10] showed no significant differences between males and females with different skeletal patterns.

Our study revealed significant differences in Class II group as well, the males having higher values in the upper and total anterior and total posterior facial height.

When comparing the males and females, respectively, belonging to different sagittal skeletal patterns, the only statistically significant differences were found in the female group in the lower and total anterior facial height. For LAFH, we would usually expect lower values

in the skeletal Class II group, because of the frequently associated dental and skeletal deep bite and forward rotation of the mandible [11]. However, our study showed higher values for LAFH in skeletal Class II, probably caused by other skeletal factors that haven't been analysed in the present study.

Some authors tried to explain these variations in Nigerian patients, taking into account the characteristics of the anterior cranial base [12].

Wang, Otsuka, Akimoto and Sato [11], assessing the correlation between the vertical facial height and the facial width and depth, come to the conclusion that in forward mandibular growth rotation there is an increase in both anterior and posterior facial height. This might explain the results in our study, the skeletal Class II cases that are associated with higher LAFH.

The posterior facial height is considered to play an important role in the vertical facial pattern, whereas the anterior facial height apparently undergoes an intrinsic growth [11].

In a comparative cephalometric study [2] considering the vertical dimensions between adult Japanese, African-American and Saudi subjects, the authors found that the Saudi sample had significantly smaller UAFH then the Japanese sample, in both sexes. No differences were recorded in LAFH between the female subjects in the Saudi and the Japanese groups. As a conclusion, the Saudi female sample had shorter TAFH than the Japanese female sample, in accordance to similar conducted studies on the Japanese population [13,14].

The high variability of vertical dimensions in different ethnic groups, demands a more thorough investigation in our local Caucasian population, in order to better understand the impact of the skeletal pattern on proper diagnosis and orthodontic treatment planning.

CONCLUSIONS

When referring to sexual dimorphism, statistically significant differences were found in skeletal Class I group with higher values for the male subjects in SNB angle, total, upper, and lower anterior facial height, total posterior facial height and the ratio between the total posterior and total anterior facial height. In Class II group the males had higher values than females for the upper and total anterior and total posterior facial height.

Comparing the vertical measurements from the male group in skeletal Class I and skeletal Class II there were no statistically significant differences between the two skeletal classes. The only statistically significant differences were found in the female group between the two skeletal classes in total anterior and total posterior facial height, both having lower values in skeletal Class I than in skeletal Class II.

Future studies that take into account more cephalometric variables might further clarify the relationship between the sagittal and the vertical skeletal pattern.

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Orthodontic forces applied on immediate loaded implants stabilized with intraoral welding - case report

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Abstract

Most of the time, the use of dental implants requires orthodontic treatment before implant placement in order to align teeth in the dental arch. Sometimes implants can't be placed until the orthodontic treatment is completed; when the implant can be placed concomitantly with the orthodontic treatment, the use of the implant as an anchor after osseointegration may be considered. Applying orthodontic forces to implants at the time of their placement decreases the time of orthodontic treatment, a demand of all patients, but it can affect implant osseointegration. In this paper, a case report is presented in which orthodontic forces were applied immediately after implant placement; the implants were inserted using plasma rich in growth factors (PRGF), stabilised by intraoral welding, and anchorage was performed through a non-immediate loaded acrylic provisional.

Keywords: intra oral welding, immediate loading, orthodontic forces, plasma rich in growth factors (PRGF).

INTRODUCTION

During the orthodontic treatment, there are certain issues that can occur, such as: mechanical interferences and anchorage problems, of which the patient has a limited compliance. These issues can be fixed easier by using the osseointegrated implants [1]. Using conventional orthodontic and orthopaedic forces does not lead to the mobilisation of the osseointegrated implants [2]. According to Bremark, the implant's period of osseointegration is of 3 months in the case of the mandible and 6 months in the case of the maxilla [3]. To reduce the period of rehabilitation, to improve the aesthetics, comfort and expectations of the patient, the clasic protocols were adapted; in this regard, the long term predictability was taken account of [4,5].

Therefore, instead of waiting during the previously mentioned period of osseointegration, it was moved to the immediate loading of dental implants, which can be defined as: applying prosthetic structures on the implants after maximum 48 hours of their insertion [6,7] or 72 hours, with the restoration of the functional occlusion [8]. With this approach, series of factors can contribute to osseointegration, such as: the material of which the implant is made, macro-geometry (shape and design) [6,8,9], micro-geometry (surface characteristics), as well as a good primary stability, able to restrict the micro-movements to less than 50-150 μm. [6,10]. Some other factors which contribute to the osseointegration of the immediate loading of dental implants are: general medical condition of the patient, appropriate bone as volume and density [7] soft diet, the biomechanic characteristic of the prosthesis (material, shape) and connection (splinting) of the implants. Implants splinting can be done with the adjacent teeth if teeth are stable with a healthy periodontium [2,6] or between implants [2,11,12].

Aim and objectives

The aim of this paper is to present a successful case in which orthodontic forces were used immediately after implant placement, using an acrylic bridge cemented to two implants for anchorage; implants were stabilized using intraoral welding.

CASE REPORT

A healthy 27-year-old male, C.K., presented in private surgery, in April 2016, for an orthodontic treatment. Patient informed consent was obtained for the following medical procedures. Initial exam notes: mandibular Kennedy class III, dental bi-maxillary anomaly with crowding, cross bite 1.2, 2.2 (Figures 1,2), with vertical and sagittal teeth displacement consecutively to space deficiency and post-extractional migration. (Figures 3,4,5).

Treatment's objectives were: teeth alignment in line with aesthetics and functional criteria, midline repositioning in reference to the anatomical face midline, cross-bite correction and prosthetic rehabilitation with functional and aesthetic results.

Combined implant supported prosthesis for the missing mandibular teeth and orthodontic alignment has been chosen as the treatment solution. For better anchorage, implants have been inserted for 3.6 and 3.7 and immediately used as anchorage points.

Figure 1. Dental bi-maxillary anomaly with crowding, cross bite 1.2, 2.2, midline deviated to the left

Figure 2. Cross bite at 1.2, vestibular displacement for 4.2 and 1.2 consecutively to occlusal interferences

Figure 3. Extruded 2.6 and 2.7 due to missing antagonists

Figure 4. Mandibular Class III Kennedy with excellent bone offer for implant placement

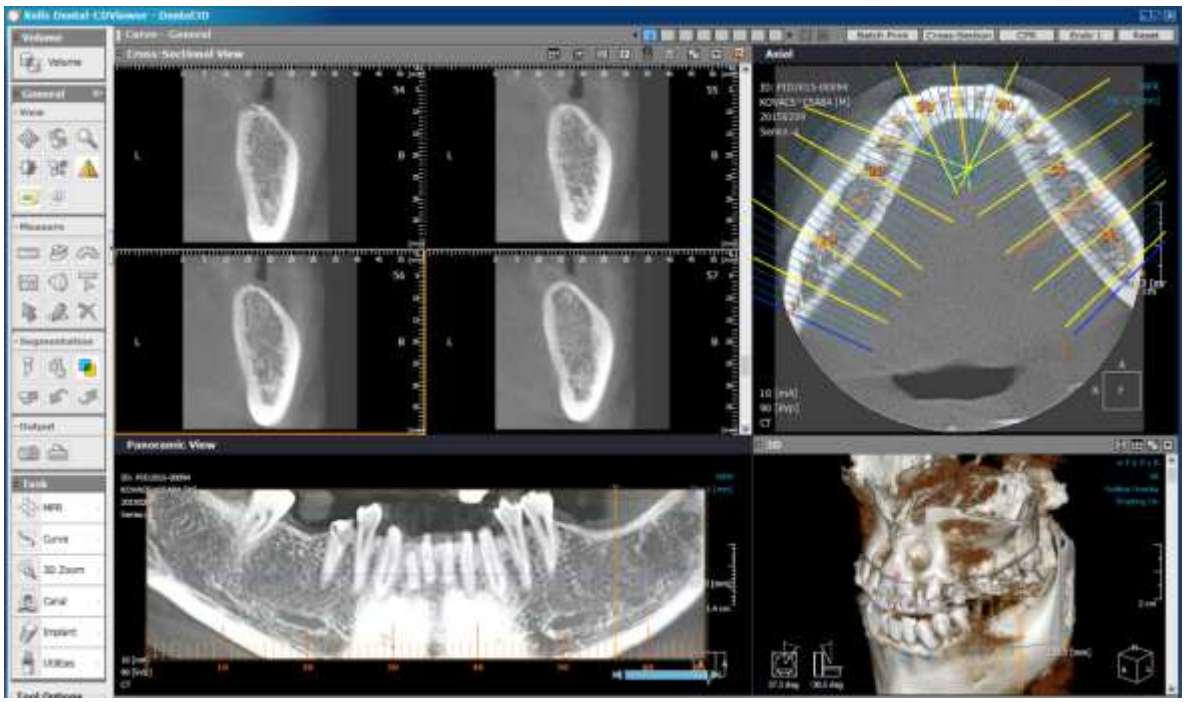

Figure 5. CBCT exam confirms available bone for implant placement

Before surgery, impressions of mandible, maxillae and of the bite were taken. The wax-up of the 3.6 and 3.7 area clearly indicates where the implants are needed; implant analogues are placed into the plaster model and stock abutments screwed in (Figure 6). Acrylic splinted crowns are prefabricated and an occlusal stop is placed on the occlusal surface of the neighbouring teeth. Crowns are largely undercut so that a better fit will be achieved through immediate underlining. The same model is used for a 2D (two dimensional or prosthetic driven) surgical guide [13]. Also, before surgery, 20 ml of blood are withdrawn from a peripheral vein; the blood is then centrifuged for 8 minutes at 580g. This separates the blood into 3 components: red cells at the bottom of the tube, above that a buffy coat of leukocytes and finally topped with the plasma which contains the platelets [14, 15]. The plasma is divided into two fractions: directly above the leukocytes there is fraction 2 -F2- which contains 2 to 3 times higher concentration of growth factors than the peripheral blood (plasma rich in growth factors - PRGF); and above it, fraction 1 –F1- with the same number of growth factors as peripheral blood which is used for obtaining fibrin membrane.

Under antibiotic protection, Amoxicillin 2g, taken 1 hour before operation, the surgery begins with an incision, flap raising, and socket preparation. The drilling for the implant socket is done at very low speed (20-80 rpm) without cooling; cooling is used only for the first drill (pilot drill) [16]. The placement of the implants (both with length 13mm, width 3.9mm, TBR ®) is under the crest at a torque of 45N/cm. Before placing the implant, the socket is filled with F2 and the implant`s surface is embedded with F2 previously activated with CaCl2 10% (Figures 7,8). The stock abutments, previously adapted by the lab technician as related to the wax up and afterwards sterilized, are mounted and their position is checked. The flap is sutured with resorbable 6.0 (Resorba ®). The flap is then positioned under the abutments' shoulder and at the same time crowns are provisionally cemented; excess cement will not affect peri-implant space and will not, therefore, induce peri-implantitis. Note: this step is specific to the particular abutment implant connection of the implant system used.

A titanium bar is then intraorally welded for implant splinting. The bar is first adapted on the plaster model, adjusted after clinical check and then welded (Figure 9). The Argon Control IOW system by Implamed is used for the sincrystallization of the bar. The titanium bar is adjusted after the welding with normal finishing burs; provisional acrylic bridge is then retrofitted with vinylethyl methacrylate Trim II (Harry Bosworth, Skokie, IL, USA), finished

and then cemented with glass-ionomer cement GC *Fuji Plus*® Resin-Reinforced, Multipurpose Cement (Figure 10). Occlusion was checked with complete clearance in all physiological movements.

The upper and the lower appliances were placed at the same time. For the upper one, a conventional FliTwin stainless steel bracket (RMO- slot 018) was used, while aesthetic braces (ORMCO - slot 018) were used for the lower one. 0.014mm Sentalloy arch wire and sliding mechanics were used for the initial alignment.

The mesial implant was placed 3-3.5 mm distally to 3.5 in order to create the necessary space for distallisation of the teeth as foreseen on the wax-up; obviously no contact point was created between the bridge and 3.5 (Figure 11). 3 months after the placement of the implants, the temporary bridge was removed, an impression was taken and another temporary bridge was put in its place, in occlusion, continuing the orthodontic treatment (Figures 12,13,14).

Figure 6. Plaster model and stock abutments screwed in

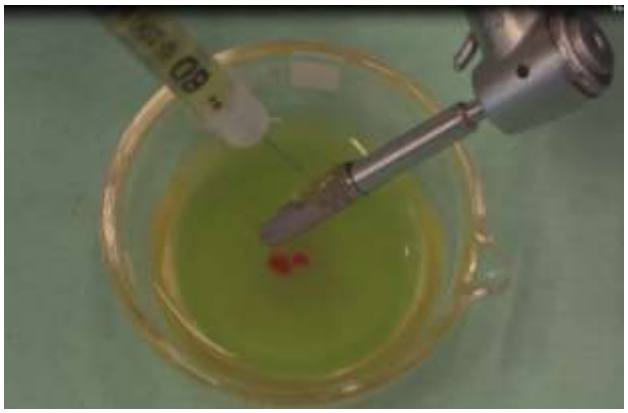

Figure 7. Implant embedded with activated fraction 2

Figure 8. Fraction 2, rich in growth factors, activated and placed into the fresh implant socket

Figure 9. Intra Oral Welding of the prosthetic abutments with a Ti2 bar. Abutment openings are protected with Teflon tape - polytetrafluoroethylene (PTFE) film - and provisional filling material (Harvard Gutta-percha ®)

Figure 10. Acrylic resin provisional is retrofitted after intraoral welding

Figure 11. Provisional acrylic bridge cemented onto the abutments welded with titanium bar; orthodontic anchorage value increased significantly

Figure 12. Panoramic X-ray 3 months after the placement of implants, immediate loading and alignment with light orthodontic forces; no bone resorption is noticed

Figure 13. Clinical aspect after provisional bridge and abutments' removal reveals a healthy gum

Figure 14. New acrylic provisional bridge in functional occlusion; a better hygiene can be maintained after titanium bar's removal

DISCUSSIONS

The presence of the mechanical stimuli is essential in the osseointegration of the immediately loaded implants, as it dictates the type and architecture of the tissue that forms at the bone-implant interface; the mechanical stimuli influence the biological processes of cellular division and differentiation [6]. The healing of a bone fracture is accelerated by functional loading. The early mechanical loding of a fracture increases vascularisation and formation of osteoid, as well as a functional bone remodelling. In order to make this type of bone heal take place at the bone-implant interface, the compressive and tensile forces must be applied constantly. No agreement has been reached yet regarding the compressive and tensile forces: some studies pin down the formation of the bone on the compressive forces, others on the tensile ones [7]. However, there is a direct relationship with the value of these forces [7].

On the other hand, an essential condition for the formation of the bone during the osseodistraction is to immobilise the 2 fragments of fractured bone. Osseodistraction has been used since the 90's for enlarging the mandibular ramus for the treatment of alveolar crest defects or to move remaining teeth into the correct position [17,18]. Similarly, to form the bone at the interface bone-implant in immediate loading, micro-movements must be limited to values smaller than 50-150 μm. Many studies pinpointed that the protocols of immediate loading have a success rate comparable with conventional loading protocols [4,19,20,21]. The limitations of the micro-movements are given not only by the quantity and quality of the bone where the implant is inserted, but by the size of the implant as well. Therefore, the size of the implant should be minimum 10 mm. [7]. Moreover, a wider implant will reduce the tension at bone-implant interface, which will encourage the formation of the bone at the bone-implant interface. [2, 22].

In addition, the micro-movements can be limited when the implants (if possible) are engaging opposing cortical. In this regard, the torque where the implant must be inserted is

minimum 40-45 Ncm; a bigger torque 60 Ncm [2] or 65 Ncm [22] will increase the tension at the bone-implant interface [2]. Therefore, the high bone compression due to an exagerate torque will lead to blood vessels compression; a reabsorption of the cortical bone and a loss of the primary stability of the implant will occur as a result of the consecutive hypoxia.

To restrict the micro-movements of the implants, Pier Luigi Mordani developed the intra-oral welding in the mid 80's [23]. Perfected later, intra-oral welding is based on the development of an electrical resistivity point between two electrodes in the presence of Argon gas, and it is called sincrystallization [24,25]. As a result of the intra-oral welding of the prosthetic abutments, screwed in the implants, the micro-movements that can appear around the implants due to their prosthetic loading are limited. The prosthesis can be applied on prosthetic abutments at the day of the implants placement, and has obvious advantages such as: 1. The aesthetic and functional rehabilitation are achieved the same day as the one of the implants insertion; 2. The errors due to the insufficiently precise impressions are eliminated; 3. The immediate stabilisation of the implants reduces the risks of failure [11]; 4. Applying the prosthesis the first 24-48 hours fom the implant placement avoids the critical period of minimal implant combine stability at 20 days [26].

It is essential that the osseointegration of the implant is stimulated in every way. Consequently biologic drilling without cooling and the activation of the surface of the implants with PRGF will encourage this process [15,27]. Additionally, the use of tensile forces applied at the cemented bridge level over the two splinted implant abutments allows orthodontic anchorage without harming implant healing. Non-functional loading has been chosen in order to avoid implant overloading by combining tensile with compressive forces. Potential structural failure (e.g. bridge fracture) has been avoided so that no extra stress is put on implants during the healing phase [2, 6]. The immediate loading protocol as compared to the classic protocol has its main advantage a reduced number of surgical treatments and total healing time, as well as fixed prosthesis while waiting and overall patient satisfaction [4].

CONCLUSIONS

A correct evaluation of the patient (clinically and radiologically) allows dental implant insertion using appropriate design and dimension so as to engage the opposite or adjacent cortical, thus ensuring better primary stability. Splinting of the implants and removal of the occlusal contacts allows easy orthodontic handling and reduces the overload of the implants during osseointegration. Reduced orthodontic forces applied on immediate loaded implants stabilized with a bar, intraorally welded onto the abutments, allows the use of a temporary bridge as an anchorage without affecting the implants during the period of osseointegration.

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Retrospective study of upper third molar pathology

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Abstract

The etiology of affections of the third maxillary molar varies according to the variety of existing conditions. Upper third molar being the last tooth that erupts in the maxillary arcade, presents the most frequent pathology of eruption, following the dental-maxillary incongruence. The main cause of the pathology of the eruption of this molar is the absence of space on the level of the alveolar arches consecutively with the phylogenetic regression of the jaws [1,2]. The upper third molar can remain included, frequently asymptomatic, can present a pathology related to the eruption or, after it is erupted in the oral cavity, can present all the injuries usual at every tooth from the arch, beginning with the tooth decay, periodontal desease and ending with the radicular rest.

Keywords: upper third molar, pathology, maxillary, eruption

INTRODUCTION

The upper third molar is tributary to the pathology of any other tooth, but it has also its own pathological, individual inheritance. The morphology of the tooth and of the tuberosity maxillary area influences the oral pathology on the level of this molar [3]. Upper third molar, or wisdom tooth, is situated on the most posterior place in the arch [4,5,6]. It is the smallest among the molars, having the most variable forms and dimensions and the hardest accessibility during the therapeutic treatment.

The upper third molar, as a result of the topography, phylogeny and ontogeny, directly or indirectly is the main cause of the numerous affections of the oral cavity, of the maxillary or of the cervicofacial region. In the pathology of the eruption of the wisdom molar, we meet a multitude of affections: infections, cysts, tumors, neuralgias, anomalies of teeth position, mastication dysfunctions, the modification of the occlusion and arthropathy [7,8]. It can lead to serious perturbations in the harmony of the dental maxillary apparatus and in the general health condition, being the point of departure for a multitude of complications [9,10]. This influences the diagnosis and the treatment in all the specializations of the dental medicine [11].

The dentist's management of third upper molar commonly hinges on identifying the presence of symptoms or disease that clearly is attributable to this molar. The doctor can ascertain the presence or absence of symptoms by obtaining a thorough medical history from the patient. Many patients report that they are not experiencing any symptoms, other patients complain of limited mouth opening (trismus) or periodic swelling or pain in the third molar region. The dentist then can perform physical and radiographic examinations to determine the presence or absence of disease, and can determine whether the examination findings correlate with the patient's symptoms. If the third molar is not visible, the clinician should perform periodontal probing to determine if the tooth communicates with the oral cavity. By posterior examination to the second molar, the doctor may come into contact with and identify an impacted third molar. This finding suggests the presence of chronic contamination with oral flora and a risk of the patient's developing inflammatory disease.

Aim and objectives

The aim and objectives of this retrospective study are to evaluate the incidence of upper third molar pathology. This was analysed based on different factors such as: gender, age, type of pathological condition. This study was based on an analysis of the cases that addressed to the Cranio-Maxillo-Facial Surgery Clinic in Timisoara over 4 years. The identification of the existing relationships between different situations and their frequencies can help us provide a statistic analysis of this number of cases.

MATERIALS AND METHODS

In this study, a retrospective analysis was performed from a total of 816 patients that were admitted in the Cranio-Maxillo-Facial Surgery Clinic from Timisoara, between the period January 1996 - December 1999. The type of study was longitudinal, based on the information provided by consultation registers, focusing on representative variables: age, gender, type of affection (according to diagnosis in the registers).

Of all 816 patients with affections of upper third molars, 316 were males and 500 females, most of them from urban areas (Table 1). It is noted that between 1996 and 1998 the number of female patients is almost double that of male patients, so that in 1999 it would be only 10% higher.

Table 1. Distribution of patients by gender; M=male; F=female

YEAR	1996		1997		1998		1999	
GENDER	M	F	M	F	M	F	M	F
CASES	61	116	73	145	56	101	126	138
TOTAL PATIENTS	177		218		157		264	

There have been thirty kinds of diseases of the upper third molar or caused by it. In the order of their frequency we listed them in the Table 2.

Table 2. Affections in upper third molar

NO.	TYPE OF DISEASE	CASES
1	osteitis (acute or chronic)	331
2	inclusion	159
3	acute pericoronaritis (congestive or suppurative)	36
4	radicular rest	33
5	apical periodontitis (acute or chronic))	25
6	dental ectopia	22
7	vicious eruption	22
8	gangrene	21
9	partial inclusion	20
10	acute pulpitis	20
11	alveolitis after tooth extraction	19
12	buco-sinusal post-extraction communication	15
13	periferic chronic periodontitis	12
14	apical abscess	11
15	haemorrhage after extraction	11
16	extraction accident	10
17	gingival hyperplasia	10
18	difficult eruption (maxillo-facial pain)	9
19	chronic traumatic ulceration of the oral mucosa	6
20	acute cellulitis	4
21	germenectomy for orthodontic purposes	4
22	periodontal abscess	3
23	fibromatosis of jaw tuberosity	2
24	dental decay	2
25	impaction	2
26	radicular cyst	2
27	ulceronecrotic stomatitis	2
28	jaw cystitis with sinus escape	1
29	epulis	1
30	cheek suppuration	1

The age of the patients ranged between 14 and 78 years, and we used six groups of ages to study: 14-25 years; 26-35 years; 36-45 years; 46-55 years; 56-65 years; 66-75 years; over 75 years (Table 3). The pathology of the third maxillary molar by gender is represented in Table 4.

Table 3. The distribution of upper third molar affections on groups of ages

NO.	TYPE OF DISEASE	14-25 years	26-35 years	36-45 years	46-55 years	56-65 years	66-75 years	over 75 years
1	osteitis (acute or chronic)	75	106	81	25	19	22	3
2	inclusion	69	33	30	13	4	10	0
3	acute pericoronaritis (congestive or suppurative)	22	8	4	0	2	0	0

NO.	TYPE OF DISEASE	14-25 years	26-35 years	36-45 years	46-55 years	56-65 years	66-75 years	over 75 years
4	radicular rest	6	13	10	0	2	1	1
5	apical periodontitis (acute or chronic)	4	10	6	5	0	0	0
6	dental ectopia	16	6	0	0	0	0	0
7	vicious eruption	12	10	0	0	0	0	0
8	gangrene	3	16	2	0	0	0	0
9	partial inclusion	6	10	2	0	2	0	0
10	acute pulpitis	6	10	2	2	0	0	0
11	alveolitis after tooth extraction	4	9	4	0	2	0	0
12	buco-sinusal post-extraction communication	0	6	5	0	2	2	0
13	periferic chronic periodontitis	0	2	4	0	2	2	2
14	apical abscess	2	5	2	2	0	0	0
15	haemorrhage after extraction	2	0	5	0	2	2	0
16	extraction accident	0	4	6	0	0	0	0
17	gingival hyperplasia	4	4	2	0	0	0	0
18	other affections	13	9	9	6	2	0	0
19	total	244	261	174	53	39	39	6

Table 4. Distribution of affections by gender (M=male, F=female)

YEAR	19	96	19	97	19	98	19	99
GENDER	M	F	M	F	M	F	M	F
osteitis (acute or chronic)	30	51	25	46	24	48	49	58
inclusion	5	26	11	36	5	24	24	29
acute pericoronaritis (congestive or suppurative)	0	4	2	9	1	2	4	13
radicular rest	3	6	6	6	2	2	8	0
apical periodontitis (acute or chronic)	3	4	2	10	4	2	0	0
dental ectopia	0	3	2	5	0	6	0	6
vicious eruption	0	3	0	5	2	2	8	2
gangrene	2	0	2	6	4	4	3	0
partial inclusion	2	8	3	2	0	0	3	2
acute pulpitis	1	2	0	4	0	1	7	5
alveolitis after tooth extraction	0	2	7	2	0	0	4	4
buco-sinusal post-extraction communication	0	0	0	4	4	5	2	0
periferic chronic periodontitis	3	1	3	0	1	0	2	2
apical abscess	2	0	4	2	1	0	0	2
haemorrhage after extraction	2	0	1	0	0	0	3	5
extraction accident	4	0	0	0	2	0	4	0
gingival hyperplasia	2	2	0	0	0	2	0	4

RESULTS

The percentage distribution of the affections of the upper third molar on groups of age is represented in the Figures 1-17. We will not take into statistical account the affections with less than ten cases.

Maxillary third molars have the greatest chronological variability in their eruption, their emergence on the arch occurring between 16-25 years. That is why we consider inclusion as a pathological condition after the age of 25 years, and we report on a total of 90 cases, by excluding the age group 14-25 years. (Figure 2).

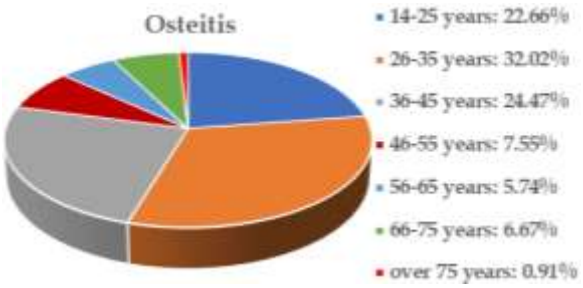

Figure 1. Diagram of osteitis

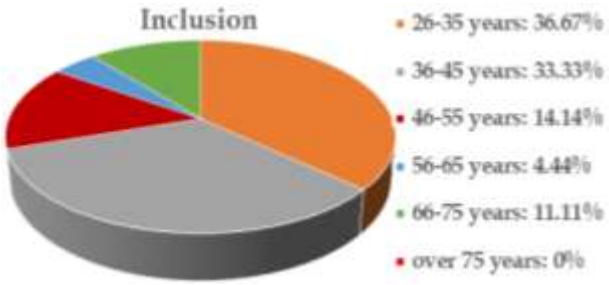

Figure 2. Diagram of inclusion

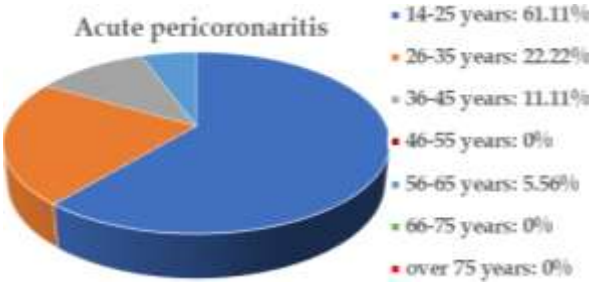

Figure 3. Diagram of acute pericoronaritis

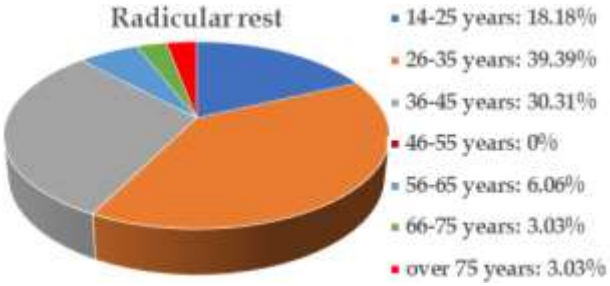

Figure 4. Diagram of radicular rest

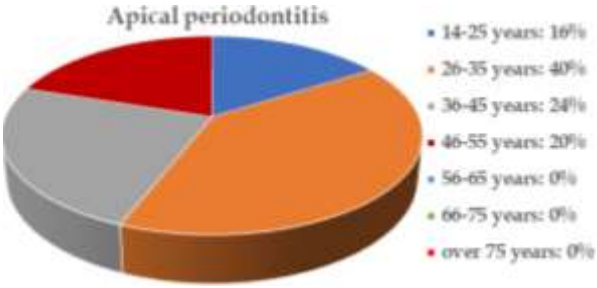

Figure 5. Diagram of apical periodontitis

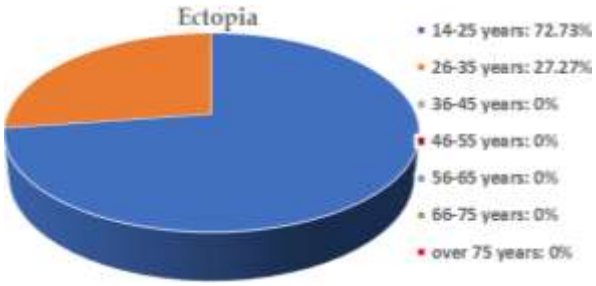

Figure 6. Diagram of dental ectopia

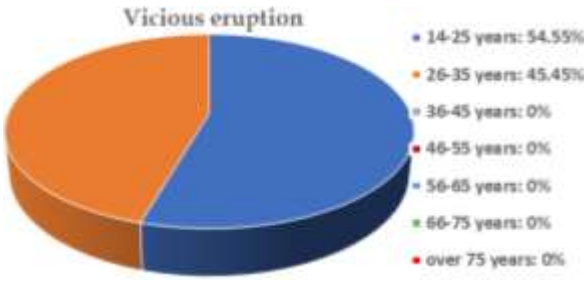

Figure 7. Diagram of vicious eruption

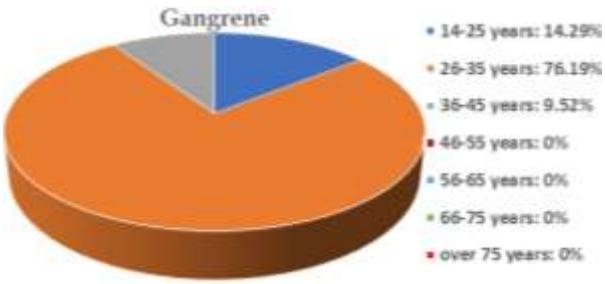

Figure 8. Diagram of gangrene

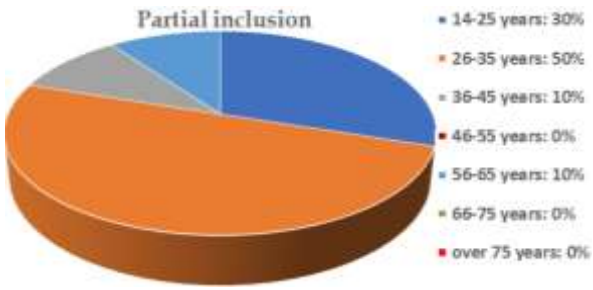

Figure 9. Diagram of partial inclusion

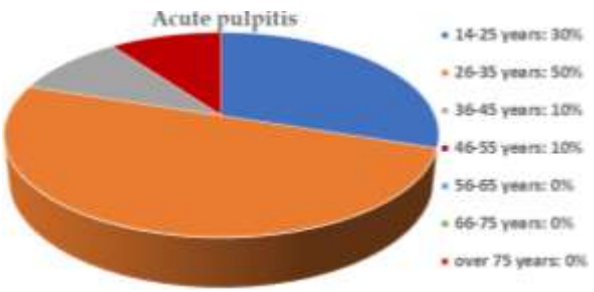

Figure 10. Diagram of acute pulpitis

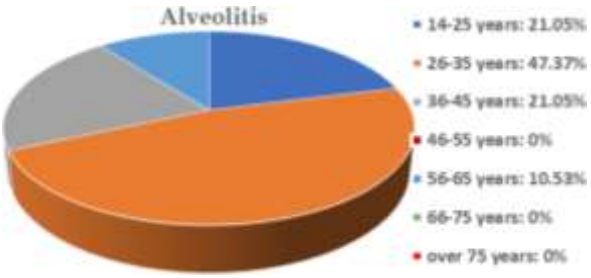

Figure 11. Diagram of alveolitis

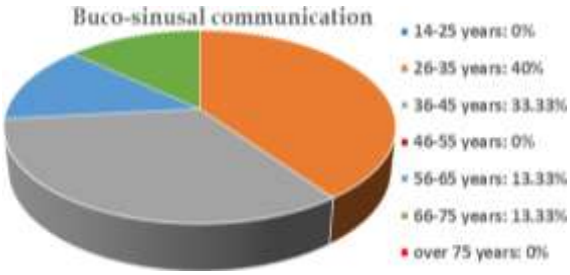

Figure 12. Diagram of buco-sinus communication

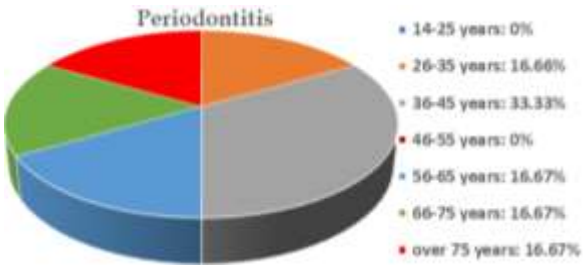

Figure 13. Diagram of marginal periodontitis

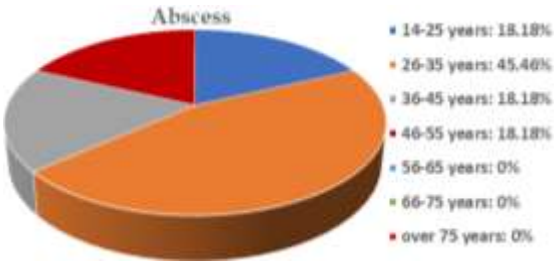

Figure 14. Diagram of apical abscess

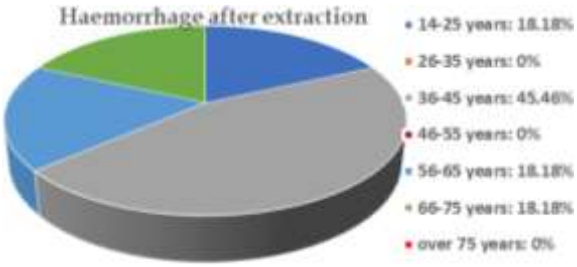

Figure 15. Diagram of haemorrhage after extraction

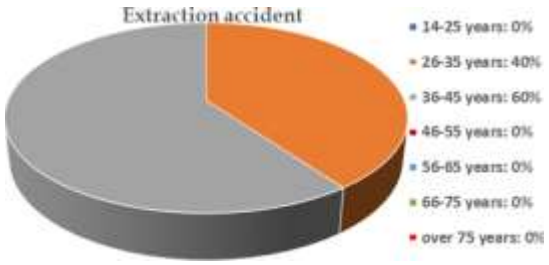

Figure 16. Diagram of extraction accident

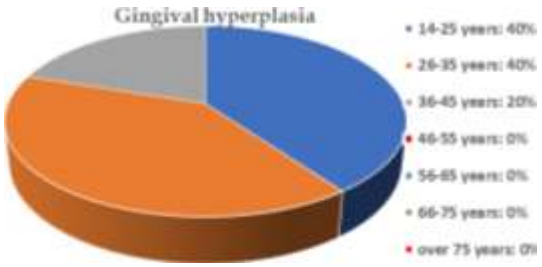

Figure 17. Diagram of gingival hyperplasia

There are diseases that have similar graphic curves: dental inclusion, pericoronaritis, vicious eruption, ectopia, because there is some interrelationship between them (Figure 18). The existence of a lack of space required for the eruption, leads to the inclusion situation, or the occurrence of a severe eruption accompanied by pericoronaritis or by the phenomenon of dental ectopia.

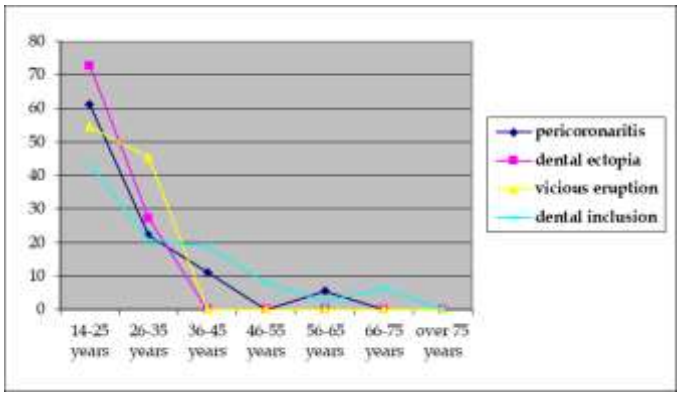

Figure 18. Comparative chart of complications caused by the lack of space required for the eruption

The lesions that appear as complications of untreated dental caries (pulpitis, gangrene, apical periodontitis, osteitis, abscess, radicular rest) also show similar graphs (Figure 19).

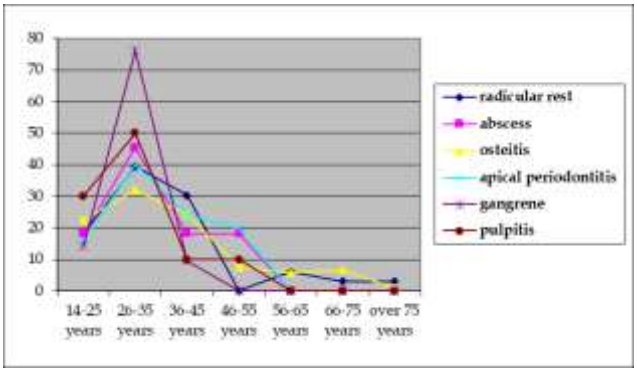

Figure 19. Comparative chart of the diseases that appear as complications of dental caries

Among the diseases of the upper third molar, which represent complications of dental caries, the largest share is osteitis. The comparative gender study is shown in the Figure 20.

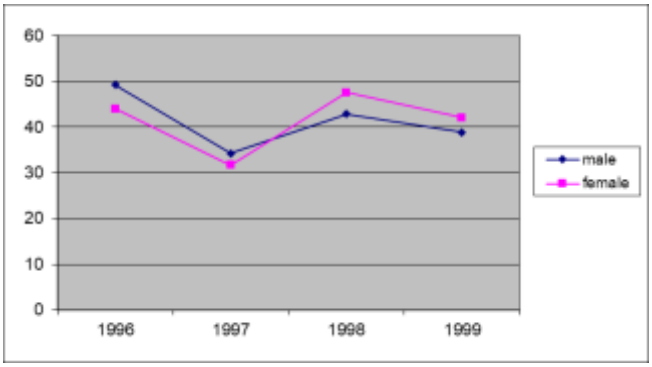

Figure 20. Comparative chart of osteitis

The upper third molar remains more frequently included in women and generates more complications related to dental eruption (Figure 21). The comparative gender study of the diseases related to the eruption of the maxillary third molar is shown in the Figures 22-24.

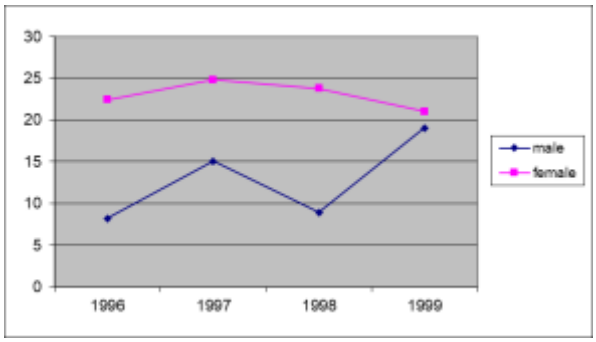

Figure 21. Comparative chart of inclusion

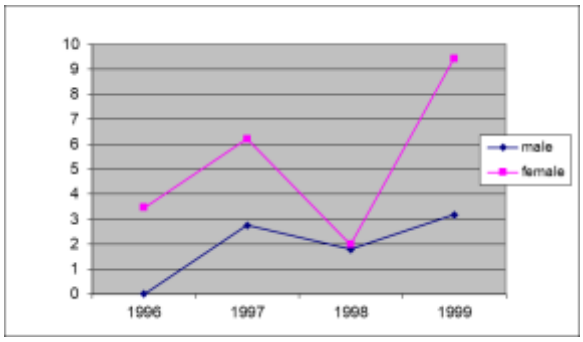

Figure 22. Comparative chart of pericoronaritis

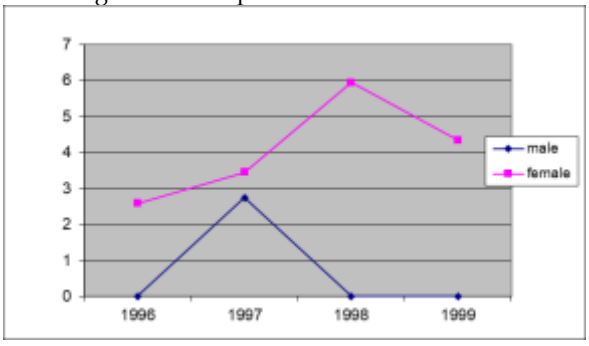

Figure 23. Comparative chart of ectopia

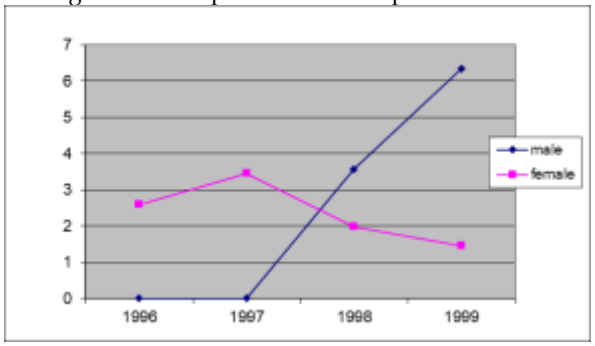

Figure 24. Comparative chart of vicious eruption

DISCUSSIONS

There has been much discussion in the literature regarding the prevalence of third molar pathology [12-18].

According to Ricketts, about half of the population needs to undergo wisdom tooth removal. The main cause consists of the phylogenetic regression of the jaw, togheter with the resulting lack of space [11]. According to Lyth, less than 5% of adults with a complete dentition have enough space for the eruption of the third molar. Therefore, the wisdom tooth plays a dominant role in inclusion incidence [1].

The maxillary third molar may be included, often asymptomatic, may exhibit an eruption-related pathology or, after being erupted in the oral cavity, may exhibit all common injuries to any tooth, from dental caries to pulpal-periapical lesions, lesions of the marginal periodontium and ending with the radicular rest.

Included superior third molar may remain for a prolonged period of time without any clinical manifestations, often being accidentally discovered through an x-ray examination, or may cause a series of accidents and complications, forcing the patient to go to the dentist. Clinical diagnosis, in cases where it develops without disturbances, is made on the finding the absence of the wisdom tooth that the patient does not remember being extracted, through the movements of the medial teeth, or the presence of a vestibular swelling distal to the second molar [19].

The diagnosis of dental impaction is based on the radiological examination. The introduction of imaging through cone beam computed tomography (CBCT) in the maxillofacial field has broadened the horizon regarding the use of tridimensional (3D) imaging as a diagnostic and treatment planning tool for oral and maxillofacial surgeons [20].

The treatment indicated in the inclusion of the maxillary third molar is radical or conservative surgery in relation to the shape, position and depth of the tooth in the bone, the existence of sufficient space on the arcade, the patient's age, the condition of the bone and the complications that inclusion has caused [1,15-17].

Morbidity associated with surgical management of third molar teeth, as well as the risk of complications, has been shown to increase with age [21-23].

The risk of future disease requiring removal of retained wisdom teeth in asymptomatic patients who retain their wisdom teeth, exceeds 70% after 18 years of follow-up [24].

20 years after UK adopts the “National Institute of Clinical Excellence” (NICE) guidelines, volume of third molar surgeries decrease, with a corresponding increase in mean age for surgical admissions and an increase in “caries” and “pericoronitis” as etiologic factors [25].

Retention of third molars is associated with increased risk of second molar pathology in middle-aged and older adult men [26].

Bacteria may contribute to systemic health problems, including: diabetes, heart disease, kidney disease, and other health problems. Studies have found that periodontal disease in expectant mothers may be associated with a greater likelihood of preterm and low birthweight babies. Research has also shown a relationship between the presence of wisdom teeth and the progression of periodontal disease [27]. 25% of wisdom teeth patients who perceive themselves as asymptomatic actually already have inflammatory periodontal disease [28].

CONCLUSIONS

The conclusions that emerge from this study are based on the analysis of 816 patients and 17 type of affections in upper third molar. The statistical analysis assessed the fact that “asymptomatic” does not mean “disease free”.

Frequency of upper third molar disease is higher in women than in males. If the diseases that are complications of dental caries have a somewhat balanced weight among the genders, the ones that appear as dental eruption complications are more numerous in the female gender, being the consequence of the lack of space required for the eruption.

Even third molars that have erupted into the mouth in a normal, upright position may not be problem-free. Their location in the back of the mouth makes them extremely difficult to keep clean. Bacteria that cause periodontal disease may exist in and around asymptomatic third molars, leading to damage before symptoms appear. Pathology is always present before symptoms appear. Once damage has occurred, it is not always treatable.

No one can predict when third molar complications will occur, but when they do, the circumstances can be much more painful and the teeth more difficult to treat.

Every patient and every case is unique. Decisions regarding surgery must consider: careful examination of the mouth, radiographic examination involving x-rays or a CT-scan, and consultation between patient, dentist and oral and maxillofacial surgeon with a balanced discussion of the benefits and risks of retention versus benefits and risks of operative management.

In general, dental professionals agree that third molars should be removed whenever there is evidence that predicts: periodontal disease, cavities that cannot be restored, infections, cysts or tumors, and/or damage to neighboring teeth.

Third molars may not require surgery if they are: completely erupted and functional, painless, free of cavities, disease-free, and in a position that can be kept clean and healthy.

Every dentist and dental specialist should understand the importance of evidence-based management of third molar teeth in the dental office.

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Diagnostic benefits of the radiologic examination in paediatric dentistry

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Abstract

Aim and objectives: To evaluate the frequency of the radiographic examination prescription and its value as a diagnostic tool in paediatric dentistry.

Material and methods: The study was conducted in the Paediatric Department of the Faculty of Dental Medicine of "Carol Davila" UMP, Bucharest on a sample of 272 patients (mean age 10.4±0.26 years), a sample of 461 radiographs and a sample of 392 radiographed teeth. Statistical determinations were performed using Chi-squared tests (significance level=95%; $p \leq 0.05$).

Results: Radiographic examination was prescribed to 36.65% of patients. Radiological examination has enabled a correct diagnosis in 59.4% of exacerbated chronic apical periodontitis, followed by 43.9% of chronic apical periodontitis, 38.9% of periodontal injuries, 15.8% of pulp necrosis and 8.3% of acute apical periodontitis.

Conclusions: Dental radiography was valuable in correcting the clinical diagnosis in many cases of complicated caries, especially in acute, chronic and exacerbated chronic apical periodontitis.

Keywords: radiographic examination, diagnosis.

INTRODUCTION

In paediatric dentistry, accurate diagnosis can be obtained by systematic and methodical collection of data on clinical and radiological bases. [1]

The radiological examination of the teeth and their supporting tissues helps the clinician to early detect caries, pulpal diseases, dental injuries, tooth developmental disturbances, the amount of space available for the permanent dentition and other pathological conditions. [1-10]

To achieve the above objectives periapical, bitewing, occlusal and panoramic films are usually used. [2, 9, 11]

The benefits versus the risks of using radiation as a diagnostic tool, especially in children who seem to be more sensitive and suffer more profound changes from radiation exposure, have been extensively debated over the last decade. [4, 12, 13] The limitation of the radiation exposure using F-speed films or digital x-rays, proper film exposure and processing techniques, protective aprons and thyroid collars are required. [2, 12, 13]

Aim and objectives

To evaluate the frequency of the radiographic examination prescription and its value as a diagnostic tool in paediatric dentistry.

MATERIALS AND METHODS

The study was conducted in the Paediatric Department of the Faculty of Dental Medicine of "Carol Davila" UMP, Bucharest.

The patients study sample (PSS) was comprised of 272 patients (147 boys and 125 girls) 54% (n=147) and girls 46% (n=125), aged between 3.24-17.35 years (mean age 10.4±0.26 years) who were consulted and treated over a period of 3 years (2012-2016). PSS was selected out of an initial patients' sample (IPS) of 742 subjects.

The selection criteria were: healthy patients with at least one prescribed radiography and with complete and correct clinical observation charts.

The radiographies study sample (x-ray SS) was comprised of 461 radiographs.

The teeth study sample (TSS) was comprised of 392 radiographed teeth (296 permanent teeth and 96 primary teeth).

The necessary variables were obtained by studying the clinical observation records of the patients: sex, age (age groups: under 6 years, 6-12 years, over 12 years), the living environment, type of teeth, type and number of requested radiographs, interested arch, the reason for prescribing the radiography, initial diagnosis based on clinical observation: uncomplicated caries, complicated caries (pulpitis: acute / chronic, necrosis: aseptic / septic, periodontitis: acute, chronic, exacerbated chronic periodontitis), injuries (dental, periodontal), dental anomalies (of number, structure, size, shape, eruption), other diagnosis (dental immaturity, pathological root resorption, ankyloses, eruption disturbances) and final diagnosis after the x-ray's interpretation.

Statistical determinations were performed using PSPP v.1.0.1 software. Chi-squared test were applied for a significance level of 95% ($p \leq 0.05$).

RESULTS

The patients study sample (PSS) represented 36.65% (n=272) of the initial patients' sample (IPS n=742) (Fig. 1).

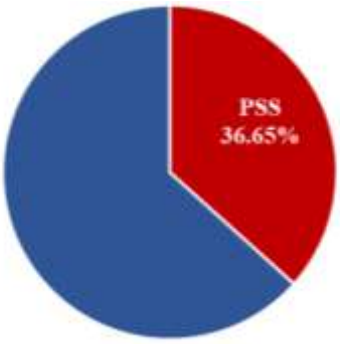

Figure 1. Prevalence of radiographies prescription in the initial study sample

Patients' distribution by sex was: boys 54% (n=147) and girls 46% (n=125).

The distribution of patients by age group was: <6 years 18.8% (n=51), 6-12 years 34.2% (n=93), >12 years 46.3% (n=126).

The distribution of the teeth study sample according the type of the tooth was: permanent teeth 75.5% (n=296) and primary teeth 24.5% (n=96).

The distribution of PSS according to the prescribed number of radiographs was: one - 62.5% (n=170), two - 20.6% (n=56), three - 9.2% (n=25), four - 4.8% (n=13), six - 1.5% (n=6), seven - 1.5% (n=4).

The distribution of the X-rays sample by type was: ortopantomographs 1.1% (n=5), bitewing radiographs 0.9% (n=4) and periapical radiographs 98% (n=452) (Fig. 2).

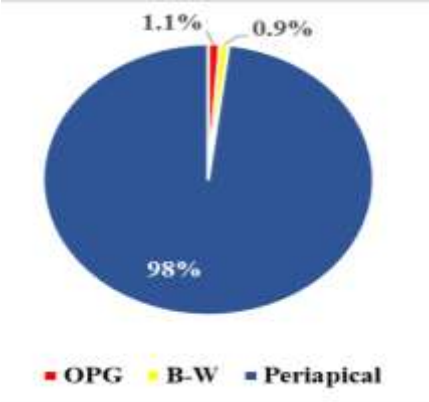

Figure 2. Distribution of the X-rays sample by type of radiography

The distribution of the X-rays sample by dental arch was: maxillary teeth 57.3% (n=264) and mandibular teeth 42.7% (n=197).

The distribution of the X-rays sample by the reason for prescribing was: establishing the final diagnosis 73.3% (n=338), evaluating the treatment's evolution 10.8% (n=50), verifying the treatment's result 15.8% (n=73) (Fig. 3).

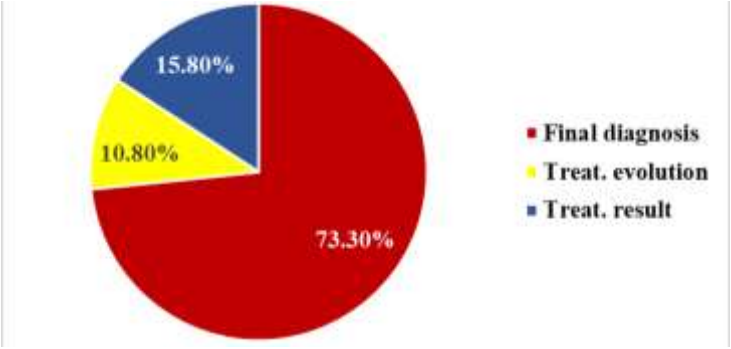

Figure 3. Reasons for prescribing the radiographic examination

The distribution of the teeth study sample according the clinical diagnosis was: simple and infected pulp necrosis and apical periodontitis 55.9% (n=219), pulpitis 15.9% (n=62), dental injuries 14% (n=55), simple caries 7.4% (n=29), dental anomalies 2% (n=8), others 4.8% (n=19) (Fig. 4).

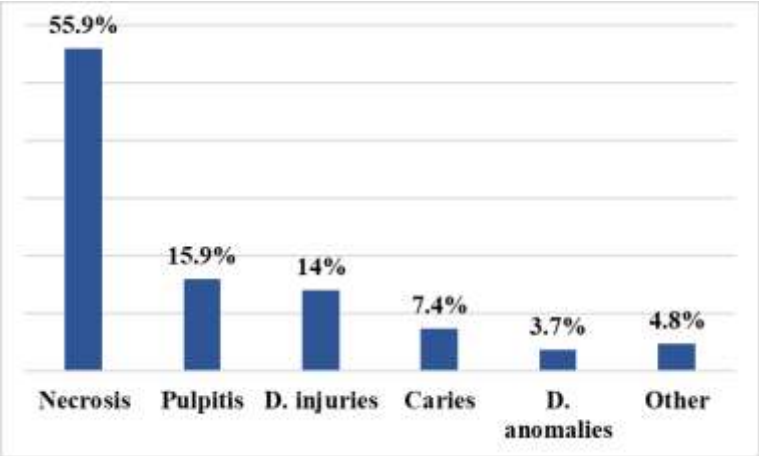

Figure 4. Distribution of the X-rays study sample according to the clinical diagnosis

The clinical diagnosis was confirmed by the radiographic examination in all cases of dental anomalies (n=24), pulpitis (n=67) and simple caries (n=24).

In all other cases, the radiographic diagnosis did not fit entirely the clinical diagnosis, thus radiological examination has enabled a correct diagnosis in 59.4% (n=19) of the exacerbated chronic apical periodontitis (ECAP), followed by 43.9% (n=18) of the chronic apical periodontitis (CAP), 38.9% (n=7) of the periodontal injuries (PI), 15.8% (n=6) pulp necrosis (N) and 8.3% (n=8) of the acute apical periodontitis (AAP). Statistically significant differences were recorded between acute apical periodontitis and chronic apical periodontitis or exacerbated chronic periodontitis (p<0.001) (Fig. 5).

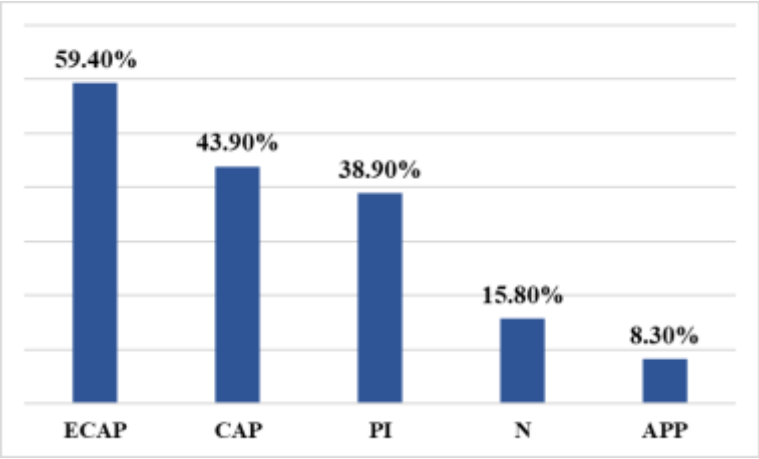

Figure 5. Disagreement rate between clinic and radiographic diagnosis

The lowest fitting rate was registered in the 6-12 years age group (mixed dentition) but this result was not statistically significant.

DISCUSSIONS

Radiological examination is required after the pedodontist established the clinical diagnosis based on systematic intraoral examination.

In the present study radiological examination was prescribed in over one third of the patients (36.65%) treated in our clinic, result which seems to be lower to those of Jung et al., 2016. [14] We tried to limit the number of radiographs to those that were absolutely necessary, in order to reduce the radiation exposure risks. Therefore, we recommended X-rays only when they might have changed the clinical diagnosis or could've brought new data to establish the proper treatment as well as to verify its correctness.

Periapical x-rays were the most prescribed type with a rate of 98.8 % result which is accordance with Espelid et al., 2003 and Sabbadini, 2013 [2, 4].

Radiological examination was prescribed in a bit over two thirds of cases for permanent teeth (75.5%).

The number of radiographs prescribed per patient was between 1 and 7, most patients being prescribed a single radiography (62.5%).

The distribution of the X-rays sample showed that over half 57.3% of the radiographed teeth were situated in the maxilla.

Nearly three-quarters of the radiographs were prescribed for establishing the final diagnosis (73.3%) which is in agreement with of Jung et al., 2016. [14]

The clinical diagnosis of pulp necrosis and periodontitis (62%) as well as pulpitis (19.1%) was the main reason for X-ray recommendation.

The clinical diagnostic was in discordance with the final diagnosis, established after evaluating the X-ray, in increasing order for: acute apical periodontitis 8.3%, dental injuries in 13.5 % of cases, for uncomplicated pulp necrosis 15.82%, for pulp necrosis in 22.9 % of cases, for periodontal injuries 38.8%, for chronic apical periodontitis in 43.9 %, for exacerbated chronic apical periodontitis in 63.4% of cases. Statistically significant differences were recorded between acute apical periodontitis and chronic apical periodontitis or exacerbated chronic periodontitis (p<0.001).

The final diagnostic fully matched the clinical diagnosis for the other studied dental diseases.

CONCLUSIONS

Dental radiography proved to be a valuable diagnostic tool in dental practice in children, since it helped in correcting the clinical diagnosis in many cases of complicated caries especially in those of acute, chronic and exacerbated chronic apical periodontitis.

Dental radiographs have also proven useful for the early detection of dental caries, for monitoring several conditions related to teeth and jaws, for the supervision of tooth development as well as for planning and checking treatments.

However, radiographic examinations should not be excessively prescribed, especially in the situation where the simple clinical diagnosis provides enough data to establish a correct therapeutic attitude.

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ERRATA – The evaluation of an impacted maxillary canine before and during orthodontic traction using conventional and cbct imaging: a case report

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Abstract

As a result of a regrettable mistake (most probably, a text editor error), in the article "The evaluation of an impacted maxillary canine before and during orthodontic traction using conventional and cbct imaging: a case report", authors: Popa G., Borţun C.M., Pop S.I., Tas R., Simon C.P., Bratu D.C., published in Medicine in Evolution, Volume XXIII, No. 4, 2017, p. 491-496, in introduction, at page 492, rows 7-10, the following phrase, which appears in duplicate, "Ericson and Kurol [18] in 1988 defined number of sectors to denote different types of impaction" was not intended to be part of the article and should be removed entirely from the text of the article. Moreover, the article does not include a reference number "[18]".

In the title of the article, the lowercase text "cbct" should be replaced with the uppercase text "CBCT" and the title should read "The evaluation of an impacted maxillary canine before and during orthodontic traction using conventional and CBCT imaging: a case report".

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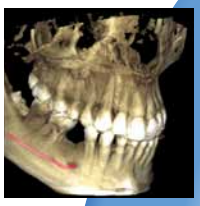

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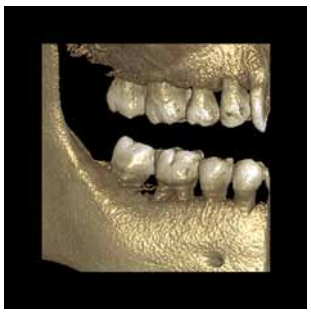
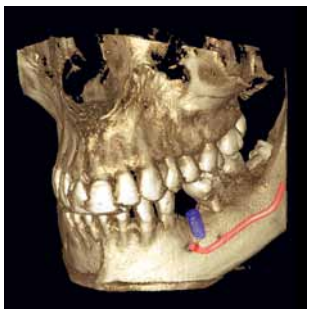
The Planmeca ProMax concept offers a full range of imaging volumes providing detailed information on patient anatomy. The comprehensive Planmeca ProMax platform complies with every need in dental radiology, offering digital panoramic, cephalometric, and 3D imaging as well as 3D face photo together with advanced imaging software.

At the heart of the concept is the robotic SCARA technology: the unique robotic arm enables any movement pattern required by existing or future program, eliminating all imaging restrictions. With the Planmeca ProMax concept superior maxillofacial radiography can be performed with a single platform, today and in the decades to come.

All volume sizes

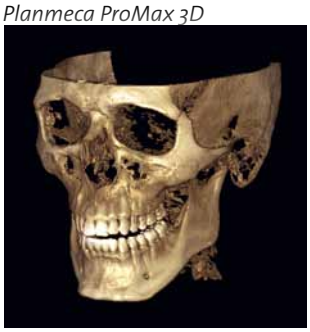


Planmeca ProMax 3D s
Ø42 x 42 mm–90 x 60 x 130 mm



Ø34 x 42 mm–140 x 105 x 130 mm

Planmeca ProMax 3D



Planmeca ProMax 3D Mid
Ø34 x 42 mm–Ø160 x 160 mm

Planmeca ProMax 3D Max
Ø42 x 50 mm–Ø230 x 260 mm

Planmeca Oy, Asentajankatu 6, 00880 Helsinki, Finland
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PLANMECA

Planmeca Romexis

Software refined

Available on the App Store

Planmeca Romexis is the software of choice for all dental imaging purposes. All patient's digital images – intraoral and extraoral X-ray images, 3D volumes, and photographs – are processed and stored in one easy-to-use system. Planmeca Romexis offers a complete set of tools for image viewing, enhancement, measurement, and implant planning, and fully integrates digital imaging with the patient's other clinical data.

Thanks to its powerful printing features, stunning printouts can be produced. Planmeca Romexis provides direct image capture from Planmeca X-ray units, interfaces with 3rd party devices via TWAIN, and is fully DICOM-compatible. Planmeca Romexis is a JAVA software that runs on Windows, Mac OS, and Linux operating systems, and embraces modern IT standards.

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PLANMECA

1971 - 2011

INSTRUCTIONS FOR AUTHORS

The journal publishes general reviews, studies and clinical, epidemiological, experimental and laboratory research, clinical case presentation, papers from the history of medicine, reviews, scientific and technical state-of-the-art articles, medical informations and opinions. Only papers which have not been published or sent for publishing in other journals are accepted. The authors are responsable for the opinions expressed in the papers. ***The paper must be edited both in Romanian and in English; the English version will be supervised by our collaborator Dana Brehar-Cioflec, MD, PhD; typed on white A_4 paper and on CD, DVD or Memory Stick***.

Manuscripts will not exceed:

- general reviews: 6-8 pages
- studies and researches: 5-7 pages
- case presentations: 2-4 pages
- reviews, scientific and technical state-of-the-art articles, medical informations and opinions: 1-2 pages.

The paper will be edited according to international editing rules for manuscripts. The title will be written in capital characters and it will be followed by the name and surname of the author (authors), followed by their place of work (place where the paper has been elaborated). Studies and researches will be followed by a brief abstract, followed by 3-4 key-words.

The body of the paper will be structured on the following chapters: introduction, aim, objectives, material and method, results and discussions, conclusions. The references will be presented alphabetically and in conformity to the Vancouver Convention, including:

- for articles: name of the authors and surname initials, title of the article in the original language, title of the journal according to the international abreviation system, year of issue, volume, number, pages;
- for books: name of the authors and surname initials, volume, publisher (editors), city of publishing, year of issue.

Citation of references inside the body of the paper will be put between brackets, Harward style (author, year) or Vancouver style (number in square brackets or superscript). Cited reference titles will be selected, maximum 6 for studies and case presentations and 12 for general reviews. Acceptance, rejection or the need of alterations in sent materials, or in inconography, will be comunicated to the authors in due time. For this, the authors will indicate the person and address for corespondence (phone number, e-mail address). Given the less pleasant experience of the editorial board with some articles being rejected because they did not meet publishing criteria, we decided to support those who intend to publish in this journal by detailing the way such a paper should be elaborated, as well as our requirements.

Except some particular aspects concerning this journal, the following details are general requirements asked or imposed by other journals as well. Conditions to be met in order to propose a paper for publishing. The main author has the responsability to make sure the article has been approved by all the other authors. The journal will have copyright

for papers accepted for publishing. The editorial board reservs the right to change the style and dimensions of an article (major changes will be discussed with the main author) and to decide the date of issue.

2. FIRST PUBLICATION

The editorial board will not consider a paper already reported in a published general review or described in a paper proposed to or accepted by another journal. This does not exclude papers which have been rejected by other journals. Also, papers which have been presented at a scientific meeting will be accepted for discussion if they have not been entirely or partially published in a similar publication. „Multiple" publishing of the same study is seldom justified. One of the possible justifications is publishing in a second language but only if the following conditions are met:

- Editors of both journals involved are fully informed;
- Priority of the initial publication will be respected by a minimum publishing interval of two weeks;
- For the second publication, a shortened version will suffice;
- The second version strictly reflects data and interpretations in the first;
- A footnote may state: „This article is based upon a study initially published in [title of the journal]".

3. PATERNITY

Paternity must reflect the common decision of the coauthors. Each author must have participated enough to take public responsability for the content. A paper with collective paternity must have a key person responsable for the article.

4. COPYRIGHT

In order to reproduce materials from other sources, written agreement from the copyright owner must be obtained:

- photographer – for unpublished photographs;
- hospital where the photographer (physician) is employed – for unpublished photographs performed during the employment period;
- initial publisher – for a table, picture or text which have previously been published elsewhere.

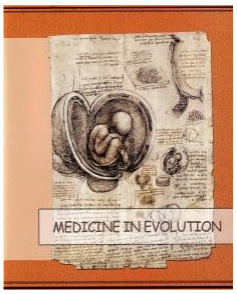
5. ETHICAL ASPECTS

Do not use name of patients, initials or hospital observation charts numbers. If a photograph of a body part which could allow direct or deductive recognition of the patient needs publishing, then the paper must be accompanied by the written consent of the patient and clinician, as well.

6. PRESENTING THE MANUSCRIPT

6.1. CONTENT OF THE PAPER - INDICATIONS FOR ORIGINAL ARTICLES

Paper title [Book Antiqua 20, bold, left alignment]



Surname N.[1], Surname N.[2] [Book Antiqua, 14, bold]

[1] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*
[2] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*

Correspondence to:
Surname Name: [10, italic]
Address: [10, italic]
Phone: +40 [10, italic]
E-mail address: [10, italic]

Abstract [Book Antiqua, 12, bold, justify alignment]

Recommendations for original studies

Original studies must include a structured abstarct of maximum 150 words, containing the following titles and informations: Aim and objectives; Material and methods; Results; Conclusions; Key words: give 3-5 key words; The abstract will be translated into an international circulation language.

Keywords: Innovation, technology, research projects, etc. [Book Antiqua 9].

INTRODUCTION [Book Antiqua, 11, bold, left alignment]

Introduction presentation of general aspects, in the context of the approached theme.

Introduction include **Aim and objectives –** Define the aim of the article. Briefly expose the rationale of the presented study or observation. Make strictly pertinent referals and do not exhaustively review the subject. Do not include data or conclusions from the paper.

There is a limitation of 4/6 pages. All pages size should be A4 (21 x 29,7cm). The top margins should be 2 cm, the bottom, right, margins should be 2cm and left margins should be 2,85 cm. All the text must be in one column and Book Antiqua font, including figures and tables, with single-spaced 10-point interline spacing.

Aim and objectives [Book Antiqua 11, bold italic, left alignment]

The text included in the sections or subsections must begin one line after the section or subsection title. Do not use hard tabs and limit the use of hard returns to one return at the end of a paragraph. Please, do not number manually the sections and subsections; the template will do it automatically.

[Book Antiqua, 11 point, normal, justified alignment].

MATERIAL AND METHODS [Book Antiqua, 11, bold, left alignment]

Describe the selection of observations or subjects for the experiment (including controls). Identify methods, equipments (with the name and address of the manufacturer in brackets) and give sufficient details on procedures. Give references for the selected methods, including statistical methods; offer details and brief descriptions for previously published methods which are not well known; describe new or substantially modified methods, justify their use and assess their limitations. Precisely identify all used drugs and chemicals, including generic names, dosage and administration ways. Describe statistical methods with sufficient details for reported results to be verified. Whenever possible, quantify discovered aspects and present them with appropriate measurement indicators for the uncertainty or error of measurement (such as confidence intervals). [Book Antiqua, 11 point, normal, justified alignment].

RESULTS [Book Antiqua, 11, bold, left alignment]

Present results in a logical succession as text, tables and illustrations. Emphasize or briefly describe only important observations. [Book Antiqua, 11 point, normal, justified alignment].

DISCUSSIONS [Book Antiqua, 11, bold, left alignment]

Underline new, important aspects of the study. Do not repeat in detail data which have been presented in previous sections. Include implications of revealed aspects and their limitations, including implications for future studies. Connect your observations to other relevant studies. Relate the results to the aim proposed for the study. [Book Antiqua, 11 point, normal, justified alignment].

CONCLUSIONS [Book Antiqua, 11, bold, left alignment]

Organize conclusions which emerge from the study. In the end state: a) contributions to be acknowledged but which do not justify paternity right; b) thanks for technical support;

c) thanks for financial or material support. [Book Antiqua, 11 point, normal, justified alignment].

REFERENCES [Book Antiqua, 11, bold, left alignment]

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in the text of the publication, assignment or essay, not in alphabetical order(according to the Vancouver rules). List only one reference per reference number. It is very important that you use the correct punctuation and that the order of details in the references is also correct.

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Internet Documents - Standard format - #. Author A, Author B. Document title. Webpage name [format]. Source/production information; Date of internet publication [cited year month day]. Available from: URL. [Book Antiqua, 10 point, normal, justified alignment].

[1] _____
[2] _____
[3] _____

6.2. CONTENT OF THE PAPER - INDICATIONS FOR CASE REPORTS

Content of the paper for case report will respect indications for original articles.

Themes may be selected from all medical fields. Manuscripts which offer a special gain for daily activity will have priority. The title must be clearly, precisely stated. It may be completed by a subtitle. It is advisable to include in the key words of the title the main message, the special element which may be observed from the case evolution. The content of a case report must be divided into three parts:

Introduction – It must include a maximum of 15 typed rows (half page). Here, the main medical problem is summarized in order to place the case in a specific domain.

Case report – It contains essential specific information on the case. In order to make a logical, chronological and didactical case report the following 5 chapters are needed:

I. Anamnesis;
II. Clinical examination data;
III. Laboratory data;
IV. Additional paraclinical investigations;
V. Treatment and evolution.

Discussions – The reason for the case report must be stated. The report must be patient-centered. Occasional deviations from typical (characteristic) evolutions, nosologically important facts must be presented in such a manner to expose the clinical picture as completely as possible. The case report must not appear as an appendix of a general review. Dimensions of a case report: maximum 6-8 typed pages, 30 rows of 60 characters/page.

6.3. MEASUREMENT UNITS, SYMBOLS, ABREVIATIONS

All measurements must be expressed in International System (IS) units. Abreviations must be fully explained when first used.

6.4. TABLES

Tables are noted with Roman figures and they will have a brief and concise title, concordant with their content.

6.5. ILLUSTRATIONS

Number all illustrations in Arabic figures in a single succession. Apply a label on the back side of every illustration, containing its number and an arrow indicating the upper side. Coloured illustrations may be accepted but it is the choice of the editors, according to particular technical abilities of each journal issue, or it may involve a fee in special cases.

6.6. EXPLANATIONS FOR DRAWINGS AND GRAPHS

Explanation for drawings and graphs must be clear and in readable dimensions, considering the necessary publishing shrinkage.

6.7. PHOTOGRAPHS

Offer glossy, good quality photographs. Any annotation, inscription, etc. must contrast with the ground. Microphotographs must include a scale marker.

6.8. ILLUSTRATION LEGENDS

Include explanations for each used symbol, etc. Identify the printing method for microphotographs.

7. COPIES FOR PUBLISHING

In order to accelerate publishing, the main author will send a set of printed sheets presenting the final version of the paper, as it will appear in the journal. It is really helpful that texts to be also sent on electronic support, diacritic characters mandatory.

8. REJECTION OF PAPERS

If a paper does not meet publishing conditions, whatever these may be, the editors will notify the first author on this fact, without the obligation of returning the material. Original photographs or the whole material will be returned only if the author comes to the editor and takes them.

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