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Acta Stomatologica Marisiensis is an official Journal of the George Emil Palade University of Medicine, Pharmacy, Science, and Technology of Targu Mures, Romania, and is published twice a year. Acta Stomatologica Marisiensis is an international journal dedicated to publishing high-quality peer-reviewed articles about all fields of dental medicine. The important topics covered by the journal refer to the complete, complex and interdisciplinary treatment of the patient with dental problems. This involves addressing all branches of dental medicine and does not exclude research in the field of nanomaterials, biotechnology or medical engineering. By focusing on the publication of new documents and evidence of high quality research, Acta Stomatologica Marisiensis aims to improve research and clinical practice of dental medicine at an international level.

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EDITORIAL

Are lasers justified in everyday clinical dental practice?

Steven Parker¹

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At first sight, such a question would seem somewhat irrelevant and outdated; it is 30 years since, as a Private Practitioner I purchased the first “dental” laser in 1989 – the year of its launch. It is well-known that much of the dissatisfaction shown towards adjunctive laser technology in the 1990s was due to the fact that this pioneering laser, as a soft tissue laser drawing its pedigree from ophthalmic use, was ill-suited to perform a valued benefit to the dentist in treating dental decay and restorative treatment in general [1].

Within a General Practice setting, the challenge exists to examine, identify, diagnose and treat oral disease processes, with minimum collateral damage. Such a challenge is met often in the presence of an anxious and sceptical patient, the greater concern with whom exists the avoidance of pain, disfigurement and aesthetic acceptance of the result of treatment. From a medico-legal perspective, the potential for collateral damage – so called iatrogenic damage – is heightened when the expectations of the patient are not met, or the treatment leads to unforeseen outcomes – a fractured marginal ridge or pulp death following excessive turbine use or bleeding, swelling, infection and scarring that may compromise a soft tissue surgical event with a scalpel and sutures. Aesthetic challenges such as harmonising the upper labial gingival margins within a proportionate smile envelope or gingival de-pigmentation, may place great stress on the clinician to deliver an ideal outcome. It is with such a background that various alternative therapies and modalities have been devised and developed over the years – air abrasion, electrosurgery and cryosurgery – and the “hi-tech” impact of laser technology that may capture the attention of the clinician; such was the case that brought me

into the world of laser photonic energy – laser light!

Light is a form of electromagnetic energy and the particulate representation of light is the photon. Laser photonic energy is a definitive “pure” emission, a single wavelength, coherent irradiation that confers specific interaction with a chosen target as well as benefitting from high intensity due to light wave non-interference [2].

Individual lasers are annotated in much the same way as motor cars; we intuitively qualify our chosen car in terms of make, model, engine size, colour, etc and the many types of lasers within the scope of clinical dentistry deserve similar qualification, simply to help us identify the areas of treatment where such a laser may be of benefit. At worst, we may allow ourselves to denote certain lasers by a group name or to reference the technology behind its manufacture and it is common to see the word “diode”, as though such generalisation may still be too wide. Instead, it should be acknowledged that each laser has an emission wavelength, a specific emission mode (type of wave delivery) and perhaps a maximum power output value; a “5W, diode 810nm, CW” laser, or a 10W, Er:YAG 2940nm, FRP” laser – irrespective of a full explanation of terminology, allows a detailed appreciation of the laser that might be considered for soft or hard oral tissue management.

Human light appreciation is represented by a narrow band-width of wavelengths, capable of detection by the retina; from “blue” to “red” colour limits, the visible spectrum is but a tiny representation of the electromagnetic spectrum which, for our appreciation of lasers, further extends from the ultraviolet to far infra-red limits. Within such a range, the many lasers currently available for dental use occupy

placings that are determined by virtue of their emission wavelength [3].

Omitting mind-numbing physics, it is sufficient to note that the discerning basis of light wavelength is its inverse proportionality to photonic energy; shorter wavelengths have higher photonic energy and there is a linear reduction in energy with ascending wavelength values. In short, blue light has higher energy than red light. Energy is fundamental to life and the component atoms and molecules of human tissue, like other non-human structures remain in a constant “ground state” energy configuration – a combination of atomic vibration and molecular spin, essentially unique for each but within the limits of normal homeostasis [4]. The basis of laser light production is that atoms of the laser host material, known as the “active medium”, when energised may absorb such external energy and adopt an essentially unstable form. The applied energy will be re-emitted in the form of a photon of light, whose energy – unique for each different atom – will correspond to a unique emission wavelength. Successive photon emission with the laser active medium, amplified back and forth through further photon-atom collision, defines the coherent nature of the laser beam.

Laser-tissue interaction draws upon the concepts outlined above. Incident laser photonic energy of a chosen wavelength has a potential for absorption by a tissue component, termed a chromophore. Individual chromophores – tissue water, haemoglobin, melanin, collagen, hydroxyapatite and carbonated hydroxyapatite, represent the most common chromophores capable of interacting with the range of laser wavelengths available in dentistry. Laser energy when applied to a target tissue, may behave in one of four basic ways: there may be transmission of the beam through the tissue without any interaction; there may be reflection of the beam across the tissue surface, again without interaction; a degree of interaction may occur and the beam is scattered as it passes into the sub-surface region of the tissue; or the light may be absorbed by the tissue and photonic energy converted primarily into heat[5].

Photonic bombardment and consequent heat build-up around 60 deg. C may cause

tissue protein to denature; at 100 deg. C water vaporisation may lead to tissue disruption and vaporisation and temperature rise above 200 deg. C may lead to carbonisation.

Within this range, it may be appreciated that a choice of correct laser wavelength may target specific and ideal chromophores and that the process of heat-mediated tissue change (termed photothermolysis) may be controlled to achieve a predictable surgical outcome.

Exposure of oral and dental tissue to laser energy will offer a potential mixture of interaction, owing to the complex and anisotropic nature of the tissue. Notwithstanding, such potential for any absorption will result in energy conversion to heat and some thermal rise. The greater the incident laser power, the higher the temperature rise and, considering the level of thermal rise above which some permanent disruption of the tissue will occur, such a level can be seen as the ablation threshold for that tissue. In applying incident laser photonic energy that exceeds the ablation threshold, the resulting change may include protein denaturation, water vaporisation and tissue carbonisation – all examples of photothermolysis [6]. At a molecular level this may induce effects including photoelectrical, photomechanical, photofluorescent, photo-magnetic, photochemical and photothermal change. Such action may be utilised as an adjunct to tissue cutting, heat-induced blood coagulation and, with bone and dental hard tissue an explosive dislocation of the crystalline structure due to water vaporisation and consequent bone removal and dental cavity preparation.

Where a laser photonic energy level is of a lower level, the tissue ablation threshold may not be reached; in consequence, a lesser amount of tissue warming may occur and the penetration of photons deep into the soft tissue – a phenomenon readily seen with near infra-red and some visible wavelengths – may stimulate cellular and intracellular structures as well as biochemical and immune pathways associated with tissue repair and healing [7]. Stimulation of these structures by sub-ablative laser photonic energy constitutes a wide-ranging combination of some stimulation (endothelial cellular budding associated with

healing), some inhibition (suppression of pain pathways) and overall a promotion of “feel good” factors that collectively is known as photobiomodulation (PBM) [8] .

In addressing the question of justified use, it may be intuitive to compare laser-mediated soft tissue management with a scalpel and hard tissue lasers with a rotary handpiece. Without doubt, dentistry is evolving from gross tissue management to more interceptive micro-management, from multi-surface tooth cavity preparation and potentially weakened support for extensive restoration, to small, non-Blacks non-classical cavity design, utilising micro-retention techniques and bonded composite restoratives. Laser-assisted tooth cavity preparation may be judged as less injurious to the tooth compared to the gross cutting and vibration of high-speed rotary instruments and the less-aggressive interaction may pre-dispose to less discomfort and a pain-less experience for the patient. Equally, soft tissue management, either as an adjunct to tooth restoration or as a basis for aesthetic improvement of the “smile line”, can prosper through the capacity of laser photonic energy to create incisional haemostasis, to obviate the need for sutures and dressings and even harmonise surgical hard and soft tissue management within the same appointment. With such advantage, the repertoire of minor soft tissue surgery may be greatly expanded to include fibroma removal, frenectomy, gingival de-pigmentation and benign pathology.

Increasing investigation into the effects of photobiomodulation as induced by sub-ablative laser irradiation – either as a by-product of a laser-assisted surgical procedure or as a monotherapy to address and influence surface or deep tissue inflammation, neuropathy or pathology – has greatly extended the usefulness and potential for laser use in dentistry [9-13]. Photobiomodulation has been shown to reduce post-surgical pain and influence the speed and acceptance of orthodontic tooth movement. With growing awareness of this significant benefit of non-surgical laser use, the ability of the dental clinician to expand and develop new areas of therapy may be augmented [14-15].

Laser-induced photochemistry has allowed the clinician to expand tooth-bleaching

techniques and laser photodynamic therapy, matching suitable photosensitisers to chosen incident laser wavelengths has greatly influenced the antibacterial offence within the periodontal pocket and peri-implant soft tissue defect [16].

Throughout the 1990s the “turf wars” of competing laser manufacturers spawned research into areas such as significant microbial reduction, uneventful healing, reduced para- and post-operative discomfort and operating speed and precision, each claiming superiority of their laser wavelength; unfortunately, a woeful lack of laser operating parametry and technique together with a predominance of case reports and in-vitro studies, introduced a significant lack of consistency and reproducibility, resulting in disappointment within the clinical setting. The paucity of structured education and certification meant that often the new laser user was condemned to self-teach – a necessity that greatly affected the progress along a learning curve and often led to discontinued use or instances of avoidable clinical negligence.

In latter years, the access to accredited education in laser dentistry has undergone considerable improvement. Organisations and societies have drawn upon the expertise of notable opinion-makers to deliver lectures and practical experience. A few universities in Europe – private as well as public universities – have developed structural and modular courses, leading to post-graduate Master-level degree courses during the past 10 years and the over-riding influence of the Internet in bringing research and distance-learning facilities, has greatly enlightened the first few steps that the new laser-user needs to take in acquiring the skills to fully integrate laser technology into their everyday clinical practice.

Above all, structured and meaningful evidence-based research into procedures and applications of laser photonic energy has undergone great improvement and direction; the acceptance of an ascending hierarchy of randomised clinical investigations, systematic reviews and meta-analyses over anecdote and case reports, is leading to a greater significance being offered through investigation standardisation among peer-reviewed publications [17].

Through this new-found discipline, the many claims of laser influence in clinical dentistry may re-establish reality over hyperbole and enable the clinician to fully appreciate the wide usefulness of lasers in dentistry. The next frontier is to integrate laser dentistry as a modular component of undergraduate teaching and the author has developed course structure and clinical case exercises to enable the dental student to receive theoretical and practical education but also to demonstrate competency in a variety of clinical scenario. The only barrier to expansion of undergraduate teaching remains the willingness of the Institutions of Academia to adopt such technology as an integrated element of all forms of clinical armamentaria.

After almost 30 years, laser use in all areas dentistry may be viewed as fully justified and in many instanced, indispensable.

Conflict of interest: None to declare.

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ORIGINAL RESEARCH

Assessment of oral mucositis degree due to cytostatic treatment in patients with malignant lymphomas.

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Abstract

Introduction: Oral mucositis characterized by inflammation of the oral mucosa, ulcers, angular cheilitis, accompanied by pain in the maxillary facial area are symptoms of patients who have undergone cytostatic treatment, affecting over 75% of high-risk patients.

Material and methods: From the total of 182 patients with hematological malignancies, we selected 59 patients, diagnosed with malignant lymphomas and treated at the Hematology Department of the Medical Clinic 1 in Tîrgu Mureș, between July 2013 and June 2016, analyzing the data in the data observation sheets. The study is a retrospective one.

Results: In the group of patients studied, who were treated based on the aforementioned cytostatic plans, we found that the CVP + Rituximab plan frequently causes 1st and 2nd class stomatitis, with no patients with 3rd and 4th class stomatitis. The CHOP + Rituximab therapy plan in a total of 80 applications had complications of 1st and 2nd class stomatitis, much more frequent 1st class without stomatitis of 2nd and 4th degree. Grade III stomatitis occurs in two cases in the CHOP-Bleo belts. Introducing dental medicine in the context of medical multidisciplinary in oncology hematology is a real necessity because the oral complications of chemotherapy treatments by their severity can lead to compromise of the treatment protocol by reducing the doses or even stopping the treatment

Conclusions: Malignant hemopathies represent a significant percentage in dental disorders, and among them, the maximum severity belongs to the non-Hodgkin and Hodgkin malignant lymphomas. Stomatitis, also called gingivotoxic stomatitis caused by medication, is an acute oral complication, with erythema and edema of the entire oral cavity. The role of the dentist in the diagnosis, prevention and treatment of oral lesions, following the cytostatic therapy, is extremely important.

Keywords: mucositis, chemotherapy, cytostatic oral manifestation.

Introduction

Oral mucositis characterized by inflammation of the oral mucosa, ulcers, angular cheilitis, accompanied by pain in the maxillary facial area are symptoms of patients who have undergone cytostatic treatment, affecting over 75% of high-risk patients [1].

Symptoms of these conditions vary depending on the type of cytostatics, the number of treatments administered and the general condition of the patient, taking different forms from the most mild ones such as inflammation, dryness of the mouth, gingival bleeding, to the most serious ones such as pain, impossibility to swallow food, infections of the oral mucosa that can lead to altered general condition. [2,3].

Research into the prevention and treatment of mucositis in this setting remains limited,

with an overwhelming amount of small, single-center studies that fail to achieve a sufficient level of evidence [4].

The management of oral mucositis is a challenge, due to its complex biological nature. Over the last 10 years, different strategies have been developed for the management of oral mucositis caused by chemotherapy [5].

Generally, cytostatics have a more pronounced selective toxicity for malignant cells, being unable to act strictly selectively, to differentiate a tumor cell from a normal cell. The toxic effect of these drugs is manifested especially on tissues with a high degree of multiplication, such as the epithelium of the digestive tract, especially the oral cavity, the epidermis and the bone marrow.

Objectives

In this study, we propose the assessment of the degree of detectable stomatitis in the oral cavity following the administration of cytostatics used in the treatment of malignant lymphomas.

Material and methods

From the total of 182 patients with hematological malignancies, we selected 59 patients, diagnosed with malignant lymphomas and treated at the Hematology Department of the Medical Clinic 1 in Țirgu Mureș, between July 2013 and June 2016, analyzing the data in the data observation sheets. The study is a retrospective one, and it is based on the findings in the patients' observation sheets. The study protocol has been approved by the institutional ethical committee and from the head of the Medical Clinic 1 in Țirgu Mureș. We quantified the following parameters:

- The type of lymphomas established by histopathological immunohistochemical and cytogenic examination.
- The staging of the disease, according to the criteria of Ann Arbor plan and the degree of malignancy appreciated according to WHO and REAL classifications.

c. Therapeutic plan followed

d. The assessment of cytostatic toxicity on the oral mucosa was made based on information gathered from the patient's observation sheets and the assessment and recording of the stomatitis degree was done according to the oral toxicity scale approved by the WHO:

- Class 0 - without objective and subjective symptoms
- Class 1 – pain + erythema
- Class 2 – erythema, ulcers; patients can swallow food
- Class 3 – extended erythema, ulcers, patients cannot swallow solid foods
- Class 4 – enlarged mucositis, feeding is impossible.

Results

Of the total of 59 patients diagnosed with malignant lymphoma, 18 patients suffered of Hodgkin's Malignant Lymphoma (HL) and 41 patients of Non-Hodgkin's Malignant Lymphoma (NHL). (Table 1)

Table 1. Number of patients depending on the type of malignant lymphomas

Srt. no.	Diagnosis	Patients	
		Number	Percentage %
1	Non-Hodgkin malignant lymphoma (NHL)	41	69,49%
2	Malign Hodgkin lymphoma(HL)	18	30,50%
3	Total	59	100%

Both patients with Hodgkin's Lymphoma and those with non-Hodgkin's Lymphomas belonging to the studied group were in different stages of clinical evolution at the time of starting the cytostatic treatment.

Of the 18 patients with HL, 3 patients were in clinical stage II with no risk factors, 10 patients in clinical stage III, of which 5 with risk factors and 5 patients in clinical stage IV, of which 3 with risk factors. Cytostatic administrations applied to patients with malignant lymphomas are listed in table no. 2.

The main therapy plans used in the Hematology Service in the patients in the studied group were the following:

- ABVD (Anthracycline, Bleomycin, Vinblastin, Dacarbazin).
- CVP (Cyclophosphamide, Vincristin, Prednisone) + Rituximab
- CFA (Cyclophosphamide) + Rituximab
- CFA (Cyclophosphamide) + Fludarabine combinations

- CHOP (Cyclophosphamide, Doxorubicin, Vincristin, Prednisone) + Rituximab most commonly used.
 - CHOP-Bleo (Cyclophosphamide, Doxorubicin, Vincristin, Prednisone, Bleomycin)
 - CHOP-ETOP (Cyclophosphamide, Doxorubicin, Vincristin, Prednisone, Etoposide)
 - DHAP (Cytosin Arabinoside, Doxorubicin, Prednisone)
 - CASC (Cyclophosphamide, Cytosine-Arabinoside, Soludecortin, Cisplatin)
- The last 4 treatments are used in increasingly rare cases, especially in cases of relapse or refraction.

Table II Type of medication given depending on the disease

Malignant lymphoma	Type of cytostatic treatment	No. of applications
NHL	CVP+Rituximab	44
	Fludarabină	31
	CFA+Rituximab	26
	CHOP-ETOP	14
	CHOP+Rituximab	80
	CHOP-Bleo	19
NHL refractory or relapsed	DAHP	14
	CASC	13
HL	ABVD	127

Of the 41 patients with NHL, 10 patients suffered of indolent lymphoma and 31 patients suffered of aggressive lymphoma. (Table 3)

The severity of stomatitis according to the type of cytostatics and the number of treatments administered in patients with Malignant Lymphomas is shown in table no. 4.

In the group of patients studied, who were treated based on the aforementioned cytostatic plans, we found that the CVP + Rituximab plan frequently causes 1st and 2nd class stomatitis, with no patients with 3rd and 4th

class stomatitis. The CHOP + Rituximab therapy plan in a total of 80 applications had complications of 1st and 2nd class stomatitis, much more frequent 1st class without stomatitis of 2nd and 4th degree. Grade III stomatitis occurs in two cases in the CHOP-Bleo belts.

The Chi square test, with the value 0.1138, so $p > 0.05$, shows that there is no statistically significant association between the degree of stomatitis and the type of cytostatic / number of treatment plans administered.

Table 3. Number of patients with malignant lymphomas depending on the diagnosis and clinical stage

Srt. No.	Diagnosis	Clinical stage	No. of patients
1	Non-Hodgkin malignant lymphoma	Indolent	10
2	Non-Hodgkin malignant lymphoma	Aggressive	31
3	Hodgkin malignant lymphoma	II	3
4	Hodgkin malignant lymphoma	III	10
5	Hodgkin malignant lymphoma	IV	5
6	Total	-	59

Table 4. Correlation of stomatitis degrees with cytostatic type

Treatment type	CVP+	CHOP+	CHOP-	DAHP	CASC	ABVD
	Rituximab	Rituximab	Bleo			
	N=44	N=80	N=19	N=14	N=14	N=127
Stomatitis GR I	15	19	8	2	2	15
	34,09%	23,75%	42,1%	14,28%	15,38%	11,81%
Stomatitis GR II	3	8	5	4	3	7
	6,81%	10%	26,31%	28,57%	23,07%	5,5%
Stomatitis GR III	0	0	2	2	6	8
			10,52%	14,28%	46,15%	6,2%
Stomatitis GR IV	0	0	0	5	3	0
				35,71%	23,075%	
Total	18	27	15	13	14	30
	40,90%	33,75%	78,93%	92,85%	100%	23,62%

The most commonly used ABVD treatment plans caused frequent lesions in stages I, II and III, but did not reach stage IV.

The most common oral cavity lesions encompassing all four stages of stomatitis were found in the case of DAHP and CASC treatments where 35% and 23%, respectively, of class IV stomatitis were reported with severe injuries and inability to feed. Also, 46% of the treatments with CASC caused class III

stomatitis with extensive injuries and the impossibility of solid nutrition.

Discussions

Authors, like Roşianu R. Roşu A, state that mucositis can occur in patients treated with cytostatics even after the chewing process because the loss of immunity leads to dry mucous membranes and any irritation is followed by painful ulcerative lesions [6].

Introducing dental medicine in the context of medical multidisciplinary in oncology hematology is a real necessity because the oral complications of chemotherapy treatments by their severity can lead to compromise of the treatment protocol by reducing the doses or even stopping the treatment [7].

Administration of honey, zinc, and glutamine reduce the risk of developing oral mucositis during chemotherapy or radiotherapy [8].

Studies on mice at the University of Tokyo Japan have shown that stomatitis occurs in 40% of cases of cytostatic administration and in 100% of cases when cytostatic administration has been combined with radiotherapy [9].

The cytostatic toxicity of the oral mucosa is influenced by the dose of the medicine and the immunosuppressive status of the body which leads to the occurrence of infections and oral bleeding. These complications aggravate the patient's condition by prolonging the healing time, the need for parenteral nutrition, the need for antibiotic, antimycotic and analgic treatment, sometimes of the opiate type, and the pain in the oral mucosa becomes violent and dragging [10].

Most authors consider that maintaining thorough hygiene, applying mouthwashes to the oral mucosa (anesthetic and anti-inflammatory), as well as draining the oral cavity are factors that manage the risk of mucositis in patients with lymphomas and cytostatic therapy. Patients benefited from initial dental treatments, before the administration of cytostatics, as well as during the oncological treatment, recommending the maintenance of rigorous oral hygiene, oral showers, avoiding acid foods, and applying topical solutions with anesthesia and hydrocortisone on the oral mucosa [11].

Data from the literature indicate that stomatitis accompanies about 30% of the cases treated with cytostatics. Stomatitis is commonly associated with alopecia urticaria and local reactions at the site of the administration being part of the skin-bone disorders group. Besides, early complications of cytostatic treatment may be represented by gastrointestinal disorders of which vomiting

and anorexia occur in 20% of cases and hepatotoxicity in 23% [12].

It should be noted that in the cases that benefited from treatment with CASC and DAHP stomatitis occurred in about 100% of the cases the most frequent forms being the most serious respectively class III and class IV. In the treatments with ABVD, the most frequently used, we found stomatitis in 23% of the treatments. The most frequent form being stomatitis of class I.

Comparing the CVP + Rituximab versus CASC, DAHP treatment plans, we have found significant differences in toxicity, with more aggressive treatments leading to more serious complications.

Another category of early complications of cytostatic treatment are neurological disorders like peripheral neuropathy present in 10% and hematological disorders like hemorrhagic syndromes that occur between 7 and 17 days after the onset of the treatment in a percentage of about 11-12% especially after the treatments with AHP and CASC, as Welbury and Murray point out in their studies. In some cases, severe neutropenia and thrombocytopenia require an increase in the interval between treatments, antiviral and antimicrobial prophylaxis, and a decrease of cytostatic doses by 20%.

In our study, the patients did not have neurological disorders, and the antimicrobial treatment for lesions in the oral cavity was performed according to the antibiogram. Severe thrombocytopenia required thrombocyte mass administration [13].

Authors from Australia in their studies concluded that Palifermin has activity as a mucosal protectant in patients receiving intensive chemotherapy [14].

Oral cryotherapy is effective for the prevention of oral mucositis in adults receiving fluorouracil-based chemotherapy for solid cancers, and for the prevention of severe oral mucositis in adults receiving high-dose melphalan-based chemotherapy [15,16]

Other studies: Welbury R and Murray J. show that oral lesions occur mainly in patients with poor oral hygiene and periodontal disorders [17].

In the studies conducted by Spielberger R. in California USA, the authors found that the severity of oral mucositis following cytostatic

treatment and radiotherapy is lower when Palifermin is administered. The study was carried out on a batch of 212 patients diagnosed with hematological cancers, 106 patients receiving Palifermin treatment and 106 receiving placebo treatment. The incidence of oral mucositis class 3 and 4, according to the WHO was 63% in the group of patients receiving Palifermin and 98% in the patients receiving placebo. This study confirms that the administration of adjuvant medication in cytostatic treatments and radiation therapy decreases the severity of oral mucositis [18].

A single dose of palifermin before each cycle reduced the incidence and severity of mucositis. The drug was generally well tolerated, but most patients experienced thickening of oral mucosa [19].

Recently, various natural agents in plants have been noticed in mucositis, which may improve the symptoms through different interventions [20].

Conclusions

1. Malignant hemopathies represent a significant percentage in dental disorders, and among them, the maximum severity belongs to the non-Hodgkin and Hodgkin malignant lymphomas, which also cause the most severe complications in the oral cavity.
2. The cytostatic toxicity on the oral mucosa is influenced by the type and dose of the medication, but also by the immunosuppressive status of the body, which leads to the occurrence of infections, ulcerations and oral bleeding.
3. Stomatitis, also called gingivo-toxic stomatitis caused by medication, is an acute oral complication, with erythema and edema of the entire oral cavity, following the cytostatic therapy, which evolves from class I to class IV extremely quickly, causing additional suffering to patients.
4. The most common lesions of the oral cavity covering all four stages of mucositis were found in the case of DAHP and CASC treatments, where stomatitis was reported 100% and 23%, respectively, stomatitis of class IV with severe lesions and impossibility to feed.
5. There is no significant difference in toxicity between CVP+Rituximab and CHOP+Rituximab, CHOP-Bleo treatments, comparing the occurrence of stomatitis and its severity.
6. The role of the dentist in the diagnosis, prevention and treatment of oral lesions, following the cytostatic therapy, is extremely important, contributing to reducing discomfort and improving the quality of life.
7. Maintaining a rigorous hygiene, the application of mouthwashes to the oral mucosa (anesthetic and anti-inflammatory), as well as the drainage of the oral cavity are factors of risk management of mucositis in patients with lymphomas and cytostatic therapy.

Conflict of interest: None to declare.

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ORIGINAL RESEARCH

Orthodontic treatment of patients with obstructive sleep apnea syndrome (OSAS).

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Abstract

Introduction

The craniofacial skeleton in the growing child is responsive to changing functional demands and environmental factors. Orthopedic modification of facial bones through the application of constant forces over long periods of time has been a mainstay of orthodontic and dentofacial orthopedic therapy.

Aim of the study

The aim of this study was to evaluate changes in pharyngeal structures after rapid palatal expansion (RPE) and compare them with those after using a removable mandibular advancement device (MAD).

Material and methods

In order to accomplish function we modified the pattern of neuromuscular activity through mandible forward position.

Results

This finding shows that maxillary deficiency and mandibular retrognathism have been reportedly linked to OSA as both etiologic factors and sequelae of prolonged mouth breathing during the period of growth, these illustrate the potential interaction between alteration in respiratory function and craniofacial morphology.

Conclusions

Craniofacial anatomic defects, including inferior displacement of the hyoid bone, larger gonial angle, smaller anterior cranial base, altered anterior and posterior facial heights, and mandibular deficiency, have been suggested as predisposing factors for upper airway obstruction during sleep. Cephalometry has been used extensively in the fields of orthodontics and anthropology to record craniofacial form. Recently, it has been also suggested that cephalometry could be an adjunctive procedure for assessing craniofacial patterns associated with OSAS.

Estimating efficacy of rapid maxillary expansion and mandibular advancement in the treatment of paediatric SDB. This might provide alternatives to primary treatments and/or enhance interdisciplinary treatment planning for the children suffering from OSA. The relationships between maxillofacial malocclusions and upper airway volumes were investigated. Literature studies on the association of upper airway narrowing with dento-skeletal malocclusions have been confirmed by us for the group of patients studied.

Keywords: OSA, class II anomalies, maxillary expansion, mandibular advancement.

Introduction

Nasal physiological breathing is achieved by passing the air in the laminar and swirl form through the nasal passages. During breathing in, the airflow penetrates the nasal vestibule in a vertical, oblique direction. [1,2] From an aerodynamic point of view, this air is in the form of a laminar flow. When the inspired air reaches the nasal lumen, located between the vestibule and the nasal cavity, there is a transformation of the laminar flow into a turbulent flow. [3] The direction of the airflow is influenced by air velocity and anatomy of the nasal cavity. [4] Certain anatomical changes such as nasal septal deflections, as well as

functional inferior cornet hypertrophy, cause changes in nasal flow. [4,5] The obstructive sleep apnea hypopnea syndrome (OSAS) consists of episodic chains of abnormal breaths or complete upper airway obstruction. [4]

The influence of upper airways obstruction on the occurrence and perpetuation of sleeping disorders has not yet been completely understood. [6]

General dentists and orthodontists take part in the multidisciplinary management of patients with obstructive sleep apnea syndrome (OSAS) The reduction in size of the upper airway (UA) in course of sleep had been associated with many factors. [7] An aberrant

anatomy of the UA, pathological and deficient reflex activation of UA dilator muscles and extended collapsibility of the passive UA have all been determined to develop and contribute to the UA collapse [7]. It has been observed that patients who suffer from OSA have hyperactive muscles during wakefulness to compensate for poor pharyngeal anatomy. Maintenance of the airway is achieved by tonic and phasic contractions of the pharyngeal dilator muscles. [5]

Increased nasal resistance has a dramatic effect on both the maxilla and the mandible, halting growth and bringing about adaptive changes in the soft tissues that are associated with a deviation in jaw posture and tongue activity. [2] A few long-term RPE studies have shown that increments in maxillary transverse dimension are relatively stable. [8] In addition, obstruction of the airways is thought to be caused by the occlusion of the lower pharynx, as the tongue settles back posteriorly against the pharyngeal wall. [9] A mandibular repositioning device changes hyoid bone position and modifies the lower airway space below the level of the base of the tongue. [10]

Objectives

The aim of this study was to evaluate changes in pharyngeal structures after rapid palatal expansion (RPE) and compare them with those after using a removable mandibular advancement device (MAD).

Material and methods

The material for this study comprised the original lateral cephalometric radiographs of 50 patients for whom long-term records were available, aged between 8 – 14 years, girls and boys, with similar Class II skeletal characteristics. Children with one or more of the following criteria were selected: narrow maxillary arch, high narrow palate, unilateral or bilateral posterior cross bite, Class II malocclusion with large overjet.

The subjects included in the studies were selected from the patients who presented for the physiological disorders, masticatory, phonetic and self-maintenance at the department of pediatrics, ENT, orthodontics and dental facial orthopedics at Faculty of

Dentistry UMFST Targu Mures, during the period 2015-2018. Five patients with inadequate radiographs, of poor quality due to poor exposure, who hadn't worn the device, have been excluded.

MAD Treated Group

MAD prevent the collapse of the upper airway by protruding the mandible forward, thus altering the position of the lower jaw and tongue. These devices predominantly increase the volume of the airway at the level of the velopharynx. The airway space is mostly enlarged laterally, thought to be due to traction on soft tissue connections between the mandibular ramus and the pharynx.

The treatment objectives for OSAS address the physiological and symptomatic aspects of this disease. The physiological goals target obstructive events, oxygen desaturation and sleep fragmentation. Symptomatic goals target sleepiness, snoring, quality of life and possible comorbidities.

A Frankel appliance was prescribed for the subjects in the first group (figure 1).

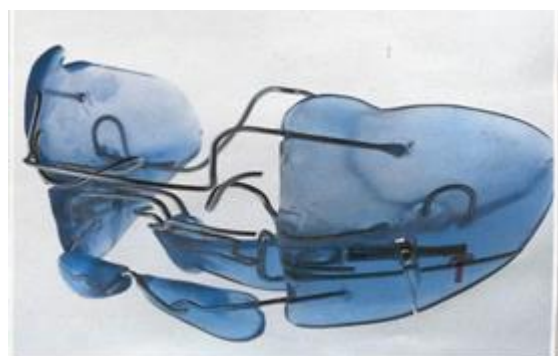


Figure 2. Customized anterior mandibular advancement device (MAD) – Frankel appliance

RPE Treated Group

The rapid palatal expander used in this study was a custom-made orthopedic appliance, bonded to the posterior upper first molars and first bicusps. It consisted of a screw that was attached to the teeth by means of bands and a metal framework. Preformed bands were fitted on the maxillary left and right first bicusps and first molars. These bands were transferred to a dental cast, on which the metal framework of the screw was custom bent to fit the anatomical features and the position of the bands, before being welded-together into place (figure 2).

The subjects were prescribed two turns activation of expansion every day, until the desired enlargement was obtained. The patients were seen regularly (every 10-15 days) during this activation period. Once the necessary expansion obtained, activation of the screw was stopped and the appliance was maintained in place for 12 months, to allow for bone tissue to form inside the open midline palatal suture.



Figure 2. Customized rapid palatal expander (RPE)

We performed the cephalometric measurements and there are defined in Table 1 and illustrated in Figures 3 and 4.

Lateral cephalograms were taken for the treated groups at T1 (initial records), and T2 (after treatment completion). The cephalometric points analyses were based on the methods of Tweed and Steiner. All of the cephalometric analyses were performed by the same orthodontist (ODR). The used imaging system was Vatech production Pax reve 3D type. Linear distance measurements were performed using Ceph software from Orthodontic Department.

Table 1. Definitions of the investigated cephalometric measurements

Measurement	Definition
N-S-Ba	Angle formed by the lines connecting the Nasion, Sella and Basion points
SNA	Angle formed by the lines connecting the Sella, Nasion, and A points
SNB	Angle formed by the lines connecting the Sella, Nasion, and B points
ANB	Angle formed by the lines connecting the A, Nasion, and B points
FMA	Frankfurt-mandibular plane angle
SN-GoGn	Anterior angle formed by the intersection of the Sellae-Nasion and Gonion-Gnation planes
Wits	Wits' appraisal: the distance between the projections of A and B on the occlusal plane
UPF-SPP	Distance between upper posterior pharyngeal wall and posterior nasal spine
LPF-H	Distance between lower posterior pharyngeal wall and hyoid bone



Figure 3. Measurements of the pharyngeal airways, before and after RPE



Figure 4. Measurements of the pharyngeal airways, before and after mandibular advancement device (MAD)

Two-tailed t-tests for paired samples were used to compare cephalometric measurements before vs. after treatment, for each of the two treatment groups.

Two-tailed t-tests for independent samples were used to compare the treatment-induced differences between the two treatment groups: (1) the anteroposterior position of the maxilla and mandible, (2) the size of the upper airways, between the RPE and the MAD (Twin Block) treatment groups included in the study. Fisher's Exact Test was used to investigate potential sex differences between the compared groups. For all hypothesis testing, the level of statistical

significance was chosen at a threshold $\alpha=0.05$. Microsoft Excel and PSPP 0.10.2 were used to perform these analyses.

Results

The studied sample consisted of 45 subjects, divided into 2 groups, according to the main intervention and treatment plan: 25 subjects treated with rapid palatal expansion (RPE), 15 females and 10 males, with a mean age of 10.45 years (SD=2.47 years), and 20 subjects treated with a functional mandibular advancement device (MAD), 11 females and 9

males, with a mean age of 9.96 years (SD=1.28 years).

Study participants turned the expander an average of 25 turns or 6.25 mm of total rapid palatal expansion. This consisted of a range of 20-34 turns, depending on the amount of expansion needed to obtain a relationship of the maxillary lingual cusp in occlusal contact with the mandibular buccal cusp. No significant differences in respect of age or sex were found between the compared groups (RPE and MAD) ($p>0.05$ t-test for independent samples and Fisher's Exact Test).

Cranial measurements: Mandibular position in relation to the cranial base (SNB) increased less ($p=0.003$ - t-test for independent samples) in the RPE group (mean SNB change of 1.2°), when compared to the MAD functional therapy group (mean SNB change of 2.2°). In the RPE group, the measures of lower facial height were increased by an average of 2.2° . A

significant increase of the vertical dimension occurred, from a pre-treatment FMA mean angle of 24.2° to a post-treatment mean FMA of 26.5° ($p<0.001$ - Student's t-test for paired samples).

In the MAD (Frankel group,) a restraining effect of the maxilla occurred from an average pre-treatment SNA angle of 82.7° to 81.4° post-treatment, exhibiting therefore a significant decrease of 1.3° ($p<0.001$ paired t-Test). After treatment, both groups exhibited favorable and statistically significant cephalometric changes of angle and linear measurements (Tables 2 and 3). Based on both, angular values (ANB) and linear measurements (Wits appraisal), RPE was found to induce less significant sagittal advancement of the mandible compared to functional therapy using the Frankel appliance (Table 4).

Table 2. Cephalometric differences before vs. after rapid palatal expansion (RPE)

Measurement	Units	Mean before RPE	SD	Mean after RPE	SD	Difference (initial minus final)	95% CI of the Difference	p-value (paired t-Test)
N-S Ba		129.31	5.47	129.10	4.39	0.21	(-1.35, 1.76)	0.787
SNA		82.10	3.76	81.52	3.65	0.59	(-0.09, 1.26)	0.088
SNB	degrees	76.41	2.89	77.66	3.25	-1.24	(-1.73, -0.76)***	<0.001
ANB		5.90	2.13	3.86	1.92	2.03	(1.39, 2.68)***	<0.001
FMA		24.24	4.36	26.48	4.95	-2.24	(-3.34, -1.15)***	<0.001
SN-GoGn		31.97	6.98	32.41	6.26	-0.45	(-1.86, 0.96)	0.519
Wits		4.90	2.48	2.83	1.56	2.07	(1.32, 2.82)***	<0.001
UPF-SPP	mm	25.21	3.90	27.14	4.48	-1.93	(-2.5, -1.37)***	<0.001
LPF-H		28.62	3.71	31.52	4.99	-2.90	(-4.03, -1.76)***	<0.001

Legend: Measurements - see Table 1, RPE - rapid palatal expander, SD - standard deviation, CI - confidence interval

Table 3. Cephalometric differences before vs. after mandibular advancement device (MAD)

Measurement	Units	Mean before Twin Block	SD	Mean after Frankel	SD	Difference (initial minus final)	95% CI of the Difference	p-value (paired t-Test)
N-S-Ba		126.42	5.54	126.42	6.56	0.00	(-1.69, 1.69)	1
SNA		82.65	4.85	81.35	4.05	1.31	(0.65, 1.96)***	<0.001
SNB	degrees	75.65	3.87	77.85	4.25	-2.19	(-2.73, -1.66)***	<0.001
ANB		7.15	2.17	3.73	1.59	3.42	(2.56, 4.29)***	<0.001
FMA		22.77	5.15	25.31	5.40	-2.54	(-4.05, -1.03)**	0.002
SN-GoGn		28.81	5.63	29.96	5.34	-1.15	(-2.11, -0.19)*	0.021
Wits		5.88	2.09	2.65	1.47	3.23	(2.39, 4.07)***	<0.001
UPF-SPP	mm	25.15	4.76	26.46	5.30	-1.31	(-2.06, -0.55)**	0.002
LPF-H		25.42	3.08	27.96	3.63	-2.54	(-3.44, -1.64)***	<0.001

Table 4. Comparison between individual paired differences after RPE vs. MAD

Measurement	Units	Mean paired difference after RPE (N=29)	SD	Mean paired difference after MAD (N=26)	SD	Difference	95% CI of the Difference	p-value (t-Test for independent samples)
N-S-Ba		-0.07	4.12	-0.02	4.21	-0.05	(-2.31, 2.21)	0.965
SNA		-0.61	1.71	-1.16	1.60	0.55	(-0.35, 1.45)	0.227
SNB	degrees	1.16	1.26	2.22	1.25	-1.06	(-1.74, -0.37)**	0.003
ANB		-1.95	1.57	-3.26	2.06	1.31	(0.32, 2.3)**	0.01
FMA		2.35	2.87	2.60	3.66	-0.25	(-2.02, 1.52)	0.78
SN-GoGn		0.42	3.82	1.25	2.34	-0.82	(-2.56, 0.92)	0.347
Wits		-2.07	1.91	-3.21	1.95	1.14	(0.09, 2.18)*	0.033
UPF-SPP	mm	1.84	1.40	1.31	1.88	0.53	(-0.36, 1.42)	0.235
LPF-H		3.03	2.92	2.45	2.11	0.58	(-0.81, 1.98)	0.403

Discussions

Rapid maxillary expansion has been shown to be an extremely efficient and effective way of widening the maxillary bony base. In the early 1900s, Körbitz, who originally postulated the "foot in-shoe" theory showed that 92% of the treated group spontaneously improved their Class II molar relationship by one millimeter or more, and almost 50% of treated patients presented an improvement in molar relationship of 2 mm or greater, without any definitive Class II mechanics incorporated into the protocol, except for the trans-palatal arch worn during the transition to the permanent dentition. [2]

The results of the study by Guest et al indicate that spontaneous improvement of Class II malocclusion occurred equally in both half-cusp and full-cusp Class II relationships. Even Volk and co-workers found improvements of Class II relationship in 7 of their 13 subjects. [1,2]

An explanation for this conversion is that the mandible moves forward after maxillary expansion, just as a foot in a narrow shoe would move forward after the shoe was widened. [10]

The rationale for this movement is that the tongue is attached to the genial tubercles of the mandible and positioning the mandible forward will also result in the tongue being positioned in the same sense. The most common skeletal problem in orthodontics is the Class II malocclusion, characterized by mandibular retrognathia. Most subjects with this type of malocclusion also exhibit narrow maxillary arches. [10]

Abnormal narrowing in the nose, nasopharynx, oro-pharynx or hypopharynx causes abnormal air exchange during sleep, leading to clinical symptoms, which vary with age Jamieson et al (1986) described a Class II pattern as being an important factor in sleep apnea syndrome and more recent research has confirmed this observation. [10]

Concerning sagittal changes, there is a substantial amount of experimental and clinical evidence that mandibular position and length can be improved, using functional orthopedic appliances. [11] Mid-facial bone volume can be increased by targeting the craniofacial sutures, which gives the mandible a functional space to

grow. Palatal expansion allows the enlargement of the upper jaw, improvement of the relationship between the jaws, and improvement of the function. Maxillary expansion makes it possible and often allows the mandible to reposition itself in a centered and forward position, thereby releasing the airway space. Several patients having undergone palatal expansion reported having easier times breathing through the nose and saw their snoring decrease

In a study by Smith et al. RPE resulted in a significant increase in nasal cavity volume, nasopharynx volume, anterior and posterior facial heights, palatal and mandibular planes and also enlarged pharyngeal airway and oropharyngeal space. [12]

In previous studies, RPE brought skeletal changes by maxillary sutural expansion and widening of the nasal cavity. Isaacson [13] found that forces as high as 22.5 lbs, or approximately 100 N, could be generated during RPE activation. These forces are transmitted through the teeth to the bone, and assuming the upper jaw is not rigidly attached to the rest of the skull, this causes the median palatal suture to widen.

Sleep-disordered breathing seems to have an important impact on the quality of life. Gonçalves et al. assessed the quality of life in children with sleep-disordered breathing before and after RME and concluded that the quality of life in these children improved significantly after expansion, regardless of the degree of airway obstruction. This supports the use of the rapid maxillary expansion device in reducing nasal airway resistance and reducing associated symptoms seen in pediatric sleep disorders, such as nocturnal enuresis, as proposed by Timms. [12]

In this study, the Frankel appliance group demonstrated higher skeletal changes and the ANB angle decreased. The inclined planes of the Twin-block appliance have been shown to be effective in maintaining forward mandibular posture even when the patient is asleep. [11] They achieve functional correction of Class II malocclusions by transmitting favorable occlusal forces to the inclined occlusal planes covering the posterior teeth, while the SNB angle increased significantly more compared to

the RPE group. These findings are consistent with multiple studies, which noted the favorable changes in the ANB angle.

In snorers, the position of the hyoid bone was more inferiorly and posteriorly placed. This position is of interest because of its relationship to the tongue position; therefore, it could be a good prognostic indicator for mandibular advancement therapy. [13] In the vertical plane, increases in lower face height and maxillo-mandibular planes angle have been reported. In the current study, the patients treated with RPE and with MAD resulted in bilateral dental and skeletal class I Angle relationships, maxillary expansion, lower jaw advancement and the maxillary restraint, a decreased over jet, with a normal lip position, gaining a significant skeletal correction and improving the esthetics of their facial profile.

The orthopedic appliances were used to protrude the mandible, widen the maxilla, to improve jaw relationships and to correct Class II and to expand the pharyngeal airways. Such functional devices have already been proposed for pharyngeal airway expansion in the treatment of OSA. The Frankel I appliance used in this study also had palatal expansion capabilities, therefore inducing both a sutural maxillary expansion and a mandibular advancement and repositioning effect in MAD-treated study participants.

The subjects of the present study had normal height and weight for their age, they weren't obese, and no significant age or sex differences were found between the two groups.

In both groups included in this study, but mostly in the MAD group, the mandibles rotated posteriorly (the mandibular plane angle increased), which was consistent with the findings of Bondemark. As a consequence of the posterior rotation of the mandible, the FMA increased. The posterior rotation of the mandible may have been an effect of patients sleeping with their mouth open, thus allowing an extrusion of their posterior teeth.

This study did not evaluate the maxillary transverse development induced by RPE and MAD, or the mandibular growth potential of children; these aims were not in its scope. Instead, it investigated the effects of RPE and MAD on pharyngeal structures and whether

these treatment options may have a potential to improve sleep apnea. The study was limited in its means by the fact that it was retrospective and only evaluated linear and angular measurements on lateral cephalograms. Cone-beam CT data were not available for the studied sample. Another limitation of the present study has been the moderate size of the available sample.

Despite this, most skeletal changes observed in the present study were found to be statistically significant, some of which may also be considered large enough to be clinically important (ANB, Wits' appraisal, LPF-H). Favorable structural changes at the pharyngeal level appeared to be triggered by both manipulations of the skeletal bases: the maxilla (RPE) and the mandible (MAD). Both RPE and MAD seem to have a clinically significant impact on the dental and skeletal systems and may be considered useful appliances for treating OSA, as previously suggested by Smith et al

More recent studies confirm the existence of significant dento-skeletal and volumetric upper airway changes induced by both RPE and MAD but are concerned by the low level of evidence regarding the long-term stability of clinically significant results following these treatments. Therefore, the clinical implications of the current retrospective study should be interpreted with caution and in light of other research on phenotypic variants of the cranial base, while also taking into consideration the role of genetic and physiologic differences between individuals.

By improving the relations between maxilla and mandible, the pharyngeal airway space seems to improve as well, however, whether all patients are suitable for RPE or MAD correction as a treatment of pediatric sleep apnea is still under debate and for the time being has not yet been well documented.

Conclusions

1. An interdisciplinary approach is needed to properly diagnose and make a predictable treatment plan for pediatric obstructive sleep apnea patients.
2. Favorable changes in pharyngeal space occurred after functional appliances and RPE treatments in growing children.

3. Early orthopedic treatment corrects the sagittal intermaxillary relation in Class II children, inducing significant pharyngeal changes that may benefit patients with mild to moderate obstructive sleep apnea syndrome.

Conflict of interest: None to declare.

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ORIGINAL RESEARCH

Prevalence of primary and secondary dental dystrophies on a group of preschool and school-age children from Tîrgu-Mureş.

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Abstract

Introduction: Pediatric Dentistry offers a completely different approach compared to that of adults especially in terms of patient cooperation, problems with growth and development and problems related to dental restoration in the context of a developing dentition.

Aim of the study: The purpose of this study was to assess the prevalence of primary and secondary dental dystrophies among preschool and school-age children.

Material and Methods: The group of 113 subjects with ages between 3 and 11 years was selected from two primary and preschool education establishments from Târgu-Mures. Simultaneously with the clinical examination of dental surfaces, 150 questionnaires were distributed to the parents of the subjects. The dystrophies determined clinically were arranged in a certain category of number, form, volume and structure and were correlated with the answers to the questionnaires.

Results: According to the data most cases of dental dystrophies are represented by dental fluorosis followed by severe early childhood caries S-ECC, and in equal percentages are present dyschromia, imperfect amelogenesis, MIH hypomineralization, dental fusion, macrodontia and hyperdontia.

Conclusions: There are significant correlations between the primary dental dystrophies and factors that intervened during pregnancy and in the post-natal period, both critical periods for dental formation and development.

Keywords: dental dystrophy, fluorosis, dental fusion, childhood caries, post-natal period.

Introduction

Pediatric Dentistry offers a completely different approach compared to that of adults especially in terms of patient cooperation, problems with growth and development and problems related to dental restoration in the context of a developing dentition. [1]

Tooth formation process begins in the prenatal period (in the 5th week by initiating dental lamina formation) and ends in the postnatal one, with the apical development of the last erupted tooth. Any time during the dental development process a number of extrinsic and intrinsic factors can interfere, that can disrupt the physiological process of odontogenesis. The intensity or nature of the disturbance depends on: the age at which the factor interfered, its duration of action and intensity, thus the dystrophic lesion may be lighter or more severe [2]. If the etiological factor acts for a prolonged period, the lesion will be more extended in surface and in depth. If it acts brutally, but for a shorter period, the lesion will not be extended in surface but only

in depth. Among the clinical manifestations of dental dystrophies, we underline: the aesthetic disorders (anterior positioning), change in the position of the adjacent teeth (rotations, crowding) and nerve disorders like neuralgia or cystic degeneration (formation of tumours) [3].

Primary or secondary dental dystrophies are commonly found in pedodontic practice, therefore periodic clinical examinations are needed starting with a young age which offers the possibility of an early diagnosis and also a greater variety of therapeutic possibilities with favourable prognosis and minimal impact on permanent dentition.

Material and methods

In order to determine the prevalence of dental dystrophies among school children and pre-schoolers, a group of subjects was established from two primary and preschool education establishments from Târgu-Mureş, with ages between 3 and 11 years. The written consent from the management of the learning

units and the parents of the subjects, was obtained for this study.

A total of 131 children were examined, of which 68 girls and 63 boys. Simultaneously, 150 questionnaires were distributed to the parents of the subjects included in the study, of which 106 responded. The study was carried out in two stages: in the first stage, the clinical examination of selected subjects was performed and in the second stage a questionnaire was completed by the carriers of the children included in the study.

The clinical examination was performed in the medical offices of the educational institutions and at the Pediatric Dentistry Department from Faculty of Dental Medicine, UMFST under proper conditions, in natural light, without previous washing or drying of the teeth.

The clinical examination was performed using disposable gloves and dental instruments (probe, dental tweezers, mirror) when needed, special attention given to the morphology and affected dental structures.

The dental surfaces of the subjects selected for the study, were inspected through visual examination and those surfaces that were not intact and had structure changes were explored with a dental probe in order to detect the contour defects and their surface and depth expansion. After a brief diagnosis, the dystrophies determined clinically were arranged in a certain category of number, form, volume and structure.

The questionnaire had the purpose of detecting primary or secondary etiological factors that could have interfered with the process of dental development and determined the occurrence of tooth dystrophy.

The questionnaire chart included 5 clear, well-formulated questions and directly related to the objectives of the study regarding the age of the subjects, possible diseases and treatments of the mother during pregnancy, the natal and postnatal period.

For the analysis of the data obtained, elements of descriptive statistics were used, statistical analyses being carried out using Epi Info for Windows.

Results

The data obtained from this study were systematized in results obtained from the questionnaires and results obtained from the clinical exam.

The distribution of subjects by age categories was analysed initially, so the most representative group is that of subjects of 8 years (32% almost 1/3 of the total number of cases), followed by the age group of 9 years (29%), 10 years, 7 years, 11 years and 3 years with percentages of 15%, 11%, 8% and 5% respectively (figure1).

Results obtained from the clinical examination

Of the total of 131 subjects examined, 68 were female and 63 males, of whom 13% showed dental dystrophies (17 cases).

According to the data obtained it was observed that most cases of dental dystrophies are represented by dental fluorosis (4.58%), followed by severe early childhood caries S-ECC (3.81%). In equal percentages of 0.76% the presence of dyschromia, imperfect amelogenesis, MIH hypomineralization, dental fusion, macrodontia and hyperdontia was observed. (figure 2)

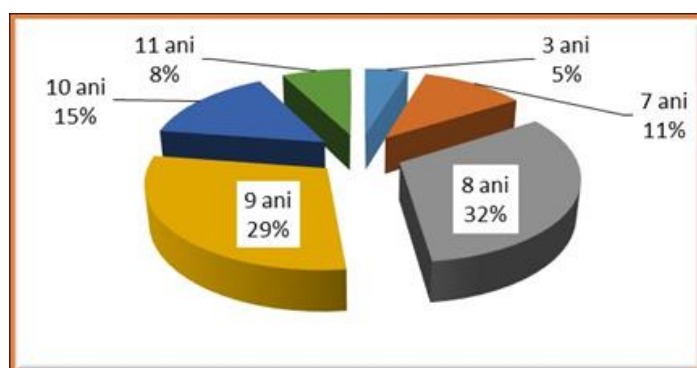


Figure 1. Distribution of cases depending on age

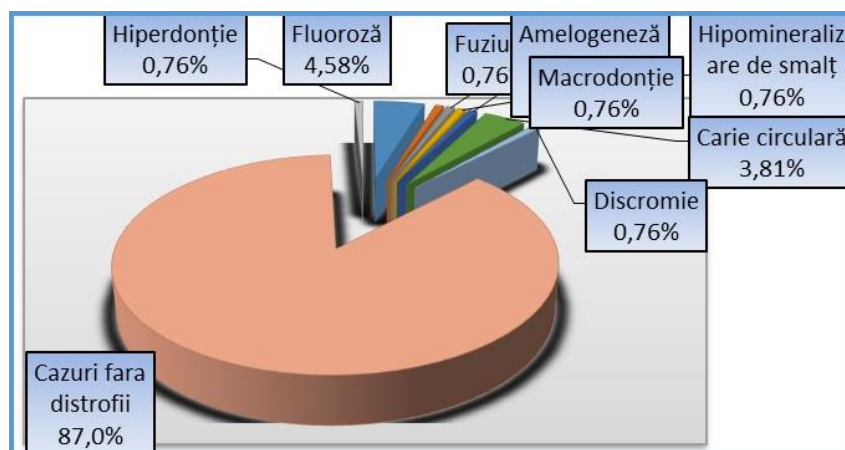


Figure 2. Distribution of cases depending on the clinical type of dystrophy

Of the total of dystrophies diagnosed on the study group, a higher degree of damage to the temporary teeth was observed compared with permanent teeth, which is due to the higher

number of children with early mixed dentition respectively those aged 8 years compared to those with permanent dentition (Table 1).

Table 1.

NR.CRT.	DYSTROPHY	AFFECTED TEETH
1	Fluorosis	Temporary and permanent
2	Enamel hypomineralization	Permanent
3	Fusion	Temporary
4	Imperfect amelogenesis	Temporary
5	Circular caries	Temporary
6	Macrodonia	Permanent
7	Localized discoloration	Temporary
8	Hiperdontia	Permanent

Regarding the data analyzed after completion of the questionnaires, it was observed that, of the total of 106 mothers that completed the questionnaire only 2 presented, during pregnancy, severe conditions that needed a complex treatment that could have disturbed the dental development process. As far as the question about tetracycline is concerned, it wasn't given during pregnancy. At the question about accidents with dental trauma in children around the age of one, 3 mothers responded affirmatively.

The presence of dental issues (simple and complicated caries) in the family reported 25% positive answers and the other 75% were unsure which leads us to believe that the positive percent could be higher than indicated.

Discussions

The aim of the present study was to detect the prevalence of dental dystrophies in school

children and preschoolers and to make a correlation between dental affections that appear during pregnancy and post pregnancy and possible dental dystrophies.

In the specialty literature there are a multitude of studies that make clear correlations between the dental dystrophies and the implication of the intrinsic and extrinsic factors that act during the period of dental development. In a study by Kanachanakamol V, Toungratanaphan S. and colab. for the study group were selected patients that suffered of acute and chronic malnutrition and it was observed that the prevalence of identified enamel defects was of 34,1% in boys and of 29,6% in girls. Also at least one tooth with enamel defects appeared in 31.9% of the children, enamel hypoplasia in 21,2% of teeth and 6,6% with enamel opacities. Prevalence of the defects according to sex was not observed. The study indicates that the

superior central incisors were more affected than the lateral incisors.[4]

In another study done in Scotland it was found that almost half of the examined children had enamel defects. The higher prevalence of fluorosis was found due to the high content of fluorine in drinking water. [5]

In the present study the most cases of dental dystrophies were also those of dental fluorosis, of which the most frequent causes are improper alimentation and medication (fluorine supplements) but also the use of tooth paste that is not proper for the child's age.

In a study done in 2002 the prevalence of dental anomalies of children with development disorders was evaluated. The study included 606 children and young adults with ages between 5 and 20 years (303 had development disorders and 303 represented the control group). Significant differences were found between the two groups regarding the prevalence of dental anomalies. Hypodontia was more frequent in children with development disorders (9,2%) than in the control group (2,0%). Diastema was also more frequent in children with development disorders than in the control group (20.8% and 11,6%). A significant association between hypodontia and microdontia was found in subjects from the control group. The study concludes that there is a significant correlation between the physical development disorders and dental anomalies.[6]

A study from Brazil showed that the prevalence of cases with enamel defects increases with the exposure to more fluorine. The prevalence of the defects in central incisors (the most affected teeth) is between 19% and 45%.[7]

In a study published in Iran, in 2012 1224 patients were examined, of which 396 (32,4%) presented at least one dental anomaly, of which 38,1% were males and 61,9% were females. The number of cases with supernumerary teeth in boys were five times greater than in girls. The results of this study show a prevalence of position anomalies of 16.7%, followed by shape anomalies (taurodontia) 15,9%; size anomalies (microdontia) 3,8% and 1,1% number anomalies (supernumerary teeth).[8]

Another clinical study shows that the prevalence of hypodontia is the most spread in a group of subjects, 9,41%, followed by taurodontia 8,61%, microdontia 5,35% and diastema 4,46%. Hyperdontia represents 1,19% and macrodontia 0,5%.[9] Some studies suggested even a association between taurodontia and hypodontia.[10]

In China, the study of Li Y, Navia Y. M, Brian Y reports the following statistic data: 23.9% of the examined children presented enamel hypoplasia in permanent teeth, 1,6% presented opacity, and a percentage of 22,2% was represented by other enamel defects.[11]

In Bulgaria, the studies of Atanasov report a frequency of dental dysplasia of 11.4%.[12]

The present study presents a few deficiencies regarding the lack of complementary exams such as radiology (panoramic radiography) that are necessary in the complex diagnosis of dental anomalies, especially those of number (hypodontia and hyperdontia). Therefore, the number of number dental dystrophies (hypodontia) could be higher than those recorded for the study group.

A study published in 2014 indicates that there is an association between antineoplastic medication in children and dental dystrophies. Dental anomalies were observed as late effects of the antineoplastic therapy. Their prevalence and severity depend on the child's age, the type of chemotherapy agent used, the dose of radiation and the treated area. Also, the length and the aggressivity of the treatment are taken into account. The reported dystrophies are hypoplasia, microdontia, hypodontia and taurodontia. [13]

The distribution of dental anomalies was significantly greater in boys (2,9%) than in girls (1,1%).[14]

Conclusions

Although the results and the information offered by this study are constrained because of the limited number of cases and the lack of complementary exams that would favor a complex diagnosis, it can be observed that there are correlations between the primary dental dystrophies present in the moment of birth and factors that intervened during pregnancy and in the post-natal period, both

critical periods for dental formation and development. Therefore, acute and chronic malnutrition, socio-economic conditions, the weight at birth, prematurity, the quantity of fluorine, antineoplastic therapy are in a significant direct correlation with the presence of dental dystrophies.

Conflict of interest: None to declare.

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ORIGINAL RESEARCH

Knowledge and interest of north-central Romanian mothers regarding children oral health prevention - A questionnaire based study.

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Abstract

Introduction: The development and eruption of teeth should be followed by the dentist, which is why periodic check ups are required.

Aims of the study: This study aims to evaluate the knowledge of the mothers regarding the dental hygiene of the children and the importance of presenting them in the dental office, as well as the knowledge related to the prevention of dental caries.

Material and Methods: A questionnaire comprising 15 questions was developed and handed to 290 mothers in Tirgu Mures. The questions targeted the knowledge related to the dental hygiene of the child, and decay prevention.

The data obtained were processed electronically. 51.7% of the mothers stated that the visit to the dental office should be done every 6 months, and 58.6% opted for a first contact with the dentist at the age of 3 years. 98.2% of mothers consider dental prevention to be important or very important. 75% consider that the child's hygiene must be done twice daily, and 89% said that they use the toothbrush in the child's hygiene process. 68% of the mothers know the term of dental sealing, but only 20% resorted to this method of treatment.

Conclusions: The study demonstrates the urgent need to take the lack of interest and information of parents seriously and to develop programs primarily to inform and raise awareness of the population and then to apply different preventive methods.

Keywords: child, mother, dental hygiene, prevention, questionnaire.

Introduction

According to the American Association of Dentistry (ADA) and the American Academy of Pediatric Dentistry (AAPD) more than 40% of children presently have dental caries [1,2].

The first examination is recommended when the first temporary tooth appears and not later than one year. The development and eruption of teeth need to be followed by a dentist, which is why regular check ups are required [3]. Early detection of a possible future condition in the oral cavity and early caries treatment may improve not only oral health, but general health as well [4]. The number and cost of dental procedures are lower for those who show up early and regularly to the doctor, thus proving that dental prevention increases the chances of easier, fewer or simple periodic check-ups in the future [5,6]. Failure to diagnose in time can lead to increased conditions, pain, loss of dental substance, and the treatment of these conditions is itself more expensive, more time and energy consuming. It also raises the

question of how the child perceives the visits to the dentist. If these are done early, when the baby's mouth does not have exacerbated conditions, he perceives the interaction with the dentist as pleasant, painless, even jovial [7,8]. In contrast, in the conditions in which the child meets the dentist only against the background of emergencies, the treatment will be carried out under conditions of stress, pain, for which the child will associate the visit in the dental office with something unpleasant, traumatizing [9]. Thus, phobias related to presentation to the dentist can develop, with serious repercussions on oral and general health [10].

The aim of study was based on the completion of a questionnaire, in order to evaluate the mothers' knowledge regarding the dental hygiene of the children, the awareness-raising the importance of presenting the child in the dental office and the knowledges related to the prevention of the dental caries.

Material and methods

The research group was represented by 290 mothers from Tirgu Mures city of Romania, who showed their willingness to complete the questionnaire, answering the asked questions. The questions were conceived in simple, easy-to-understand terms to avoid confusion or misunderstanding of words. The 15 questions were chosen with the purpose of obtaining information on how the research group mothers treat this subject and on their practice until then. Twelve of the questions required one answer, while three other questions were completed or not, depending on previous answers.

In the first part of the questionnaire we tried to evaluate the general knowledge related to the importance of presenting the child to the dentist, the frequency of visits to the office and to study the level of education regarding the role of the dentist in the child's life. Through these questions we also wanted to draw an alarm signal and raise constructive questions to the parents who participated in the study. We considered that before asking questions about more complex procedures, such as sealing and fluoridation, it is important to check the general health education of these mothers regarding the basic principles of oral hygiene. Thus, the following questions deal with the knowledge related to the dental hygiene of the child, the methods used, the age from which the hygiene began, the frequency, finally pointing us to the specific prevention. We wanted too, to find out what is the level of knowledge of mothers regarding the methods of prevention of dental caries in children, if the terms are known, if there have been sealing and fluoridation treatments, if they see results and if they intend to also perform such treatment on other teeth or another child.

Table 1.

1. How often do you think the child should be taken to the dentist?

- a) Every 6 months
- b) Every year
- c) Every 2 years
- d) When needed

2. At what age do you think the child should first be brought to the dentist?

- a) At 6 months old
- b) At 1 year old
- c) At 3 years old
- d) At 7 years old
- e) When needed

In the following, the questions contained in the questionnaire will be presented in detail (Table 1). The questionnaire included an item with a free answer, namely the question "From what age did you start cleaning the child's mouth?"

The data obtained were recorded and processed electronically.

Results

The first two questions dealt strictly with the aspect of the first visit to the dentist and the frequency of visits. 51.7% of the mothers reported that the visit to the dental office should be done every 6 months. We note that only a little more than half of them have the correct information, in the context where prevention plays such an important role in the subsequent oral health of their child. 17.9% of the mothers considered that the presentation to the dentist "when needed" is sufficient. It is considered that the appearance of the first tooth signals the moment of the first meeting between the dentist and the small patient.

Only 3.7% of the mothers considered that the first visit to the dentist should be at the age of 6 months.

The majority (58.6%) opted for a first contact with the dentist at the age of 3 years. It may also be related to the fact that at 3 years old the child is taken to the kindergarten and experiences the first socialization outside the family setting. However, this is not a solid enough excuse.

Too many mothers (17.9%) considered, again, the option to go with the child to the dentist when "needed". This variant of response is itself incriminating precisely because it signals the visit is made in the case of an illness that could have been prevented.

3. How many times a day is the child's hygiene performed?

- a) Never
- b) Occasionally
- c) Once
- d) Twice

4. What methods did you use?

- a) Embrocating with chamomile tea (baby)
- b) Toothbrush
- c) Floss
- d) Mouthwash
- e) Irigator

5. When did you introduce the toothbrush in the hygiene process?

- a) With the eruption of the first teeth
- b) At 1 year old
- c) At 2 years old
- d) At 7 years old

6. How important do you think oral prevention is?

- a) Very important
- b) Important
- c) Not important
- d) I don't know what the term refers to

7. What methods of preventing tooth decay are you familiar with?

- a) Fluoridation
- b) Sealing
- c) I do not know any

8. Do you know the term "dental sealing"?

- a) Yes
- c) No

9. Do you have a child with sealed teeth?

- a) Yes
- b) No

10. Have you noticed any difference between the appearance of tooth decay on sealed teeth vs. the unsealed ones?

- a) The difference is significant
- b) Yes, a small one
- c) There is no difference

11. Are you planning to use this method to prevent the onset of decay?

- a) Yes
- b) No

12. Do you know the term "dental fluoridation"?

- a) Yes
- b) No

13. Have you performed this type of treatment on any of your children?

- a) Yes
- b) No

14. Are you planning to use this method of treatment again?

- a) Yes
- b) No

A fairly large percentage of mothers consider dental prevention to be important or very important, namely 98.2% and only 1% of them, which represents in fact a number of 3

mothers out of 290 surveyed, say they do not know the term of oral prevention.

We report 75% mothers who have recognized the correct answer and consider that the hygiene of the child must be done

twice daily and only 2% consider that the hygiene of the oral cavity of the child is done occasionally.

Another question referred to the hygiene methods used by the respective mothers. As expected, most mothers (89%) said they use a toothbrush in the child's hygiene process.

As for the additional methods, the results are quite worrisome as this proves to be an overlooked area. 0.34%, the equivalent of a single mother, said she uses dental floss as an adjuvant method, 1.7%, the equivalent of 5 mothers said they use mouthwash and 2.4%, the equivalent of 7 mothers chose the oral irrigator. 51.7% introduced the toothbrush in the process of hygiene with the appearance of the first teeth, 27.5% introduced the brush at the age of one year and 19% at the age of 2 years.

Regarding the method of hygiene used during the infant's period, 2.7% of the mothers chose hygiene by embrocating with chamomile tea.

Given the extremely small number of mothers who have hygienize the baby's mouth cavity during infancy and the fact that only half of them consider that the toothbrush is introduced with the appearance of the first teeth, we have a sufficient number of mothers who do not clean in any way the oral cavity of children up to the age of one or two years old.

Most of the mothers (68%) know the term of dental sealing, so implicitly its role in the dentition of the child. However, only 20% of mothers resorted to this method of treatment. The percentage of mothers who said they saw a difference between the appearances of decay in sealed vs. unsealed teeth (significant or small

difference) is 51.7%. This is also reflected in the number of mothers willing to resort to this method of treatment or to repeat it, the percentage being 65.5%.

Another topic addressed in this study is topical dental fluoridation. We again raised the problem of the knowledge related to this subject, the number of mothers who requested this treatment, but also of the mothers who did not use this method of treatment. The percentage of mothers who know the term is relatively equal to that of mothers who do not know it. Noteworthy is the fact that more mothers are familiar with the term dental seal than fluoridation. The percentage difference is 16.2%, in favor of sealing. 14.4% of the participants in this study state that they have children who had teeth subjected to topical fluoridation and less than half of them plan to use this method. 85.5% of them do not have children who present this treatment.

Overall, although more than half of the mothers know the specific methods of preventing tooth decay (sealing and fluoridation), a very small percentage of them have children who have preventive treated teeth or wish to request such an intervention.

Discussion

A statistical study (How often do children visit the dentist for a routine check-up in the UK?) in 2016, shows that 62% of children show up at controls every 6 months, 25% once a year, 4% a given to 2 years and 2% of them in case of pain (when needed) [11].

The comparative results between UK and Romania are presented in table 2.

Table 2. Comparative results between UK and Romania

Answer options		Romania	UK
a.	Every 6 months	51.7%	62%
b.	Every year	28.6%	25%
c.	Every 2 years	1.8%	4%
d.	When needed	17.9%	2%

The major difference is found in the answer "when needed", this fact suggesting the presentation in the cabinet only in case of an emergency. The percentage of mothers who have opted for this answer is high enough to

worry about, given its seriousness. We would have expected this answer to be out of the equation because of the serious consequences that follow this way of thinking.

Following a study in England (Dental Care in the United Kingdom - Statistics & Facts)

[12], it was found that most children have first contact with the dentist by the age of two. This fact puts us at a disadvantage, given that we have a percentage of 19.7% of mothers who take this aspect into consideration.

Another study conducted in the UK (Share of age of children at first visit to the dentist in the United Kingdom) in 2016 [13], shows that 19% of children had their first visit to the dental office before 1 year old, 37% had one between 1 and 2 years old and 22% of them between 3 and 4 years old. The results obtained in our study: 3.7% for the period up to one year old, 19.7% for the period between 1 and 2 years old, 58.6% at 3 years old and 17.9% "when needed" place us in a lower position of the English, with fewer controls properly performed.

The fact that almost half of mothers claim that they see absolutely no difference between sealed and unsealed teeth is surprising given the results of many studies conducted in the field that support the exact opposite, in a rather unanimous opinion. The efficacy of these treatments has been proven, and the results are accompanied by studies and the parents' statements that they are satisfied with the results. This may be related to the fact that these children did not, by their nature, have an increased risk of caries, which is why the difference between sealed and unsealed teeth is insignificant.

After Gorard et al [14], children are obviously influenced by the environment in which they belong, and part of the parents' beliefs and attitudes inevitably become their attitudes. The study was aimed at mothers, in general, and did not specifically target mothers who have children at increased risk of caries. This may indeed be a weakness of the present study.

A study conducted at the University of Tel Aviv by Blumer et al [15], that aims to evaluate parents' attitude to these issues claims that 78.1% of parents said they were satisfied with the sealings and with the effects on their children's teeth. The number of mothers who stated that they did not heard of the term "sealing" represents about one third of the mothers who completed this questionnaire. The percentage, in this case, is worrying

considering the level of development reached and the ease of accessing such information.

The problem arises as follows: either the respective parents do not regularly attend a dental practice, or the respective doctor does not consider informing the parents about this procedure. We would go, rather with the first option, considering that, in Romania, periodic dental checks are not mandatory, and the costs of treatments often keep patients away from the dental office. Such a problem could be solved by establishing a national information program and also state programs to cover the expenses linked to oral prevention. This is the example of developed countries such as America, Belgium, Switzerland and others, and the results speak for themselves.

Conclusions

This study denotes an acute lack of information in this area and of knowledge of the severity of carious disease, a severity that will cause parents to resort to any treatment method that would solve this problem to some extent. We consider that a realistic presentation of the gravity of the dental caries and their consequences on the functionality and the dental-maxillary morphology would raise in them a greater interest to action.

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ORIGINAL RESEARCH

Statistical study on the degree of satisfaction of patients with fixed prosthetic dentures.

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Abstract

Introduction: Edentation is a major emergency and has an echo over the entire stomatognathic system. The treatment of partial edentation has undergone major changes in the last decades for multiple causes, including increasing the level of dental, medical education, introducing new techniques, methods, and materials, increasing the duration of retention of teeth on the arch.

Aim of the study: The aim of this study is to determine the degree of satisfaction of patients with a fixed prosthetic denture, to highlight the importance of communication between doctor and patient with repercussions on the results of prosthetic treatment, and evaluate the degree of awareness of oral health and oral hygiene practices.

Material and Method: For this study it was used a self-designed questionnaire, which explored both clinical and non-clinical dental services. The questionnaire consisted of three parts: first part (A) includes socio-demographic indices, part two (B) includes questions related to the doctor-patient relationship, and in the third part (C) the questionnaire asks questions regarding the general satisfaction of the patients with reference to the prosthetic treatment. The questionnaire also includes the material (s) from which the prosthetic denture is performed and the area of the edentation.

Results: The present study was performed on a batch of 117 people, 48 female, and 69 males between the ages of 21 and 60. Our results show that the majority of patients present metallic-ceramic dentures, located in most cases in the lateral area, and the majority of patients are satisfied with the prosthetic treatment. There were no patients complaining about the result of the treatment. Patients are delighted by their relationship with medical staff.

Conclusions: The most important finding of this study states that a large proportion of patients showed a lack of knowledge regarding oral hygiene measures and the importance of maintaining a fixed prosthetic denture using a dental abutment. Also, the majority of the doctors did not pay attention to the post-treatment instructions regarding the maintenance of a fixed prosthetic denture.

Keywords: partial edentation, satisfaction, fixed prosthetic dentures.

Introduction

According to the World Health Organization, partial edentation is one of the most widespread diseases affecting up to 75% of the population in different regions of the world [1].

Delayed recovery and inferior restoration of the continuity of the dental arch in the partial absence of the teeth cause such functional disorders, such as periodontal overload of the remaining teeth, the development of pathological abrasion, biomechanical disorders of the dental-maxillary system.

A distinction should be made between the partial absence of teeth and hypodontia, in which the dental defect is developed due to the absence or destruction of the permanent tooth

bud. The partial absence of teeth is a result of dental caries and its complications, extractions, and/or dental loss due to an accident (trauma), periodontal disease. [1].

Edentation is a major emergency and has an echo over the entire stomatognathic system with the possibility of inducing initially intrasystemic and then supersystemic dishomeostasis [2,3]. The treatment of partial edentation has undergone major changes in the last decades for multiple causes, including increasing the level of dental, medical education, introducing new techniques, methods, and materials, increasing the duration of retention of teeth on the arch. Many researchers have ignored the effects of edentation on general state of health. However, the necessity to take into consideration the

quality of life related to oral health has been increasingly recognized in recent decades and many studies highlight the psychosocial impact of oral disorders [4].

The prosthetic treatment of partial edentation should be regarded as a product of the comparative analysis between the bio-functional advantages and disadvantages that the case implies. In addition to the partial restoration of the functions of the stomatognathic system, a prosthetic treatment raises a series of shortcomings related to the danger of the integrity of the different structures of the stomatognathic system (eg the vitality of the teeth), to facilitate the appearance of other diseases (secondary cavities, periodontal disease), the cost for the treatment is very high sometimes and, last but not least, the risk of failure [5].

This study aims to determine the degree of satisfaction of patients with a fixed prosthetic denture, to highlight the importance of communication between doctor and patient with repercussions on the results of prosthetic treatment, but also to evaluate the degree of awareness of oral health and oral hygiene practices.

Material and method

To determine the degree of satisfaction of patients with a fixed prosthetic denture, we used a self-designed questionnaire, which explored both clinical and non-clinical dental services. To all patients interviewed were explained the purpose, method, and uncertainties based on completing the questionnaire. The sampling method was non-random or of convenience, using available participants. This situation was created for practical reasons. The anonymity and confidentiality of the participants were ensured. The participants answered each question by selecting an element from the five answer categories using the Likert scale, the answer format being the following in ascending order: very satisfied, satisfied, indifferent, dissatisfied, and very dissatisfied. The persons questioned come from Brăila and Mureș.

The questionnaire consisted of three parts.

The first part (A - General provisions) included socio-demographic indices regarding

the patient's sex, age, place of origin. Part two (B-Doctor-patient relationship) includes questions related to the Doctor-patient relationship regarding the professionalism of the medical staff (doctor, nurse), the communication skills of the dentist, the ability to listen to patients, to provide clear explanations and treatment solutions, and also to encourage the patient to ask the doctor about the treatment and provide moral support during the treatment. In the third part (C - Prosthetic Treatment) the questionnaire asks questions regarding the general satisfaction of the patients with reference to the fixed prosthetic treatment, the time granted to perform the dental treatment through fixed prosthetic dentures, the perception of the phonation, the mastication, the aesthetics, the costs of the treatment, and last but not least, post-treatment oral hygiene measures. The questionnaire also includes the material (s) from which the prosthetic denture is performed and the area of the edentation (frontal, lateral, fronto-lateral).

The results were analyzed and processed using Microsoft Office Excel 2018.

Results

The present study was performed on a batch (group) of 117 people, of which 48 were female, and 69 were males between the ages of 21 and 60. The 21-25 age group consisted of 13 respondents, followed by 26-35 years - 42 persons, 59 persons represent the 36-55 age group, and three persons over the age of 56 years. As far as the environment is concerned, 70 are from the urban area, and 47 are from the rural area.

From the study group, the majority of patients present metallic-ceramic dentures, located in most cases in the lateral area.

To the first question, "Did the staff in the dental medicine office (doctor, nurse) have shown professionalism?" most patients (75) responded that they were satisfied. No percentage of dissatisfaction was recorded.

To the second question, "How do you evaluate your relationship with the dentist?" in approximately equal proportion, the patients answered that they are very satisfied with the relationship with the doctor. Similar to the first

question, there were no patients who were indifferent, dissatisfied, or very dissatisfied.

Although most patients on the question "How do you appreciate the attitude of the doctor towards the patient?" are very satisfied and satisfied, only one person in the group declared to be indifferent.

At the question "Did the dentist offer you more treatment solutions?" seven people declared themselves dissatisfied, and eight indifferent to the treatment methods proposed by the doctor, and the other respondents were satisfied (58) and very satisfied (44).

Three people responded that they were dissatisfied with the "explanation given by the dentist." However, 52 people said they were very satisfied, and 62 people said they were satisfied with the clarifications brought by the dentist.

Interesting are the patients' answers to the question, "Did the dentist encourage you to ask questions about the treatment?". Thus five people were very dissatisfied with this aspect, nine dissatisfied, ten indifferent. However, we must take into consideration the perception of the other respondents, as follows, 26 very satisfied and 67 satisfied.

Regarding the question, "Did the medical staff offer you moral support during the treatment?" 4.3% of the total group replied that they were dissatisfied, and 9.4% were indifferent. Most were satisfied - 59%, and only 27.4% of the respondents were very satisfied.

Regarding the "general satisfaction of patients concerning prosthetic treatment," only two people were dissatisfied, no indifferent or very dissatisfied persons were registered, most of the respondents were satisfied (72).

The diversity of clinical cases existing at present in medical practice, submit the dentist to various situations. The time for performing fixed prosthetic dentures is also related to the complexity of the case. The results of the study show that out of the total number of respondents, two people stated that they were dissatisfied, four indifferent, 35 people very satisfied, and 76 people satisfied with the "time allowed to perform the dental treatment through fixed prosthetic denture."

To the question "How do you perceive food chewing after applying the prosthetic denture?" two people replied that they were dissatisfied

with this aspect, and the other 115 respondents were very satisfied (51) and satisfied (64).

There are minimal differences regarding the "perception of the phonation after the insertion of the fixed prosthetic denture," with the following answers: very satisfied (52) and satisfied (65). Also, no indifferent or dissatisfied people were registered.

The planning of the prosthetic treatment from the aesthetic point of view is the process of gathering information and elaborating a plan to approach both the dental disease and the main wishes of the patient. Although most of the patients are very satisfied and satisfied. In approximately equal proportions, three people in the study declared themselves indifferent to the aesthetic parameter, and five people stated that they were dissatisfied with the result obtained through fixed prosthetic dentures.

At the question "How do you rate the costs for the medical services offered?" in descending order, the patients reported the following: satisfied - 66.7%, very satisfied - 23.1%, dissatisfied - 7.7% and indifferent 2.6%; no person declared themselves dissatisfied.

One of the most important aspects of the treatment with fixed prosthetic dentures and which often have a decisive influence on their longevity is the achievement and maintenance of optimum oral hygiene. Regarding the "explanations given by the dentist regarding the post-treatment oral hygiene measures," the following results are interesting: five people were very dissatisfied, 23 - dissatisfied, 14 - indifferent, 19 - very satisfied, and 56 out of those interviewed were satisfied.

It was determined in which percent of the respondents use complementary means of oral hygiene: interdental brushes, silk thread, oral shower so on.

Discussions

The performance of any fixed prosthesis is evaluated by measuring the results of the masticatory function, aesthetics, longevity, as well as the technical complications. When evaluating the efficacy of fixed prosthesis therapy, Anderson in 1998 showed that it is important to consider both clinical parameters and patient ratings [6].

Communication skills and vocational training can be an important tool to improve

these deficiencies: the effects of such training have been proven and can persist over time [7].

The interactive behavior of the dentist seems to be an influential factor in achieving patient satisfaction, a positive relationship, and attitude [8]. Moral support, assessment of the patient's feelings, explanation of the following procedure, and encouraging the patient to ask questions are factors that were evaluated positively in this study. Previous research has compared the relationship between the dentist and the behavior of the patient, indicating that these characteristics were appreciated as an essential aspect of professional competence [9]. The present study indicates the idea that out of the 117 interviewees, in approximately equal proportions, the patients are satisfied and very satisfied with their relationship with the dentist. In the doctor-patient relationship, human and personal aspects have been identified as a significant problem. Satisfaction plays an essential role by respecting the patient, improving oral health care, with every visit to the dentist. Simple questions and information can sometimes significantly affect the quality of communication between the dentist and the patient, which is why the doctor must be not only a good practitioner but also a good psychologist [10].

The finding regarding the communicative behavior of the physician is strongly linked to the communicative style of the patient and his personal or social characteristics that may have important implications for the daily practice of the physician. The physician should be aware of the existing differences in information and involvement of patients from all social levels in consultation, as well as the underlying causes [11]. The doctor should encourage patients to discuss their concerns and ask questions, but they should also listen actively. Our study showed that 57.3% of patients are satisfied with the idea that the dentist encourages patients to ask questions regarding the treatment, 22.2% were very satisfied, 8.5% were indifferent to this aspect, 7.7% were dissatisfied, and 4.3% were very dissatisfied.

Patient satisfaction is an essential source of information that can guide the dentist in performing prosthetic treatment, which will meet the patient's expectations. The way the dentist communicates with patients has been

shown to influence patient satisfaction, at least in the short term. The communication capacity of the dentist is a significant problem both in the management of patients and clinically.

Most of the previous studies have indicated the hypothesis that communication was one of the essential features of the dentist from the patient's point of view [12,13]. It seems that the primary concern of patients was courtesy, and this was a key factor in increasing their satisfaction.

The literature suggests that masticatory difficulty has the potential to have a direct or indirect influence on the psychological and social dimensions of oral health. It has been suggested that such effects may be mediated by limiting the choice of foods and the enjoyment of meals and nutrition [14]. In the study, the high percentage of satisfied patients with their restoration indicates that they are satisfied with most of the functional aspects of the fixed prostheses; the patients interviewed reported that they were satisfied (54.7%) and very satisfied (43.6%) with the masticatory ability after the insertion of the fixed prosthetic denture, and only 1.7% were dissatisfied, the claim is supported by several scientific articles [15,16]. The interviewed patients did not have speech disorders; as a result of the therapy, no participants in this study encountered problems in pronouncing phonemes. However, despite the fact that from a technical and functional point of view the fixed prosthetic denture in most cases was a success, 7.7% of the participants were dissatisfied with the costs of the fixed denture, 2.6% were indifferent, and the rest were satisfied or very satisfied with the prices.

With all the progress made in the various fields of science and technology, dentistry still preserves its art attribute. Often patients are more interested in the aesthetic aspect of the restoration than the functional one. The social impact of facial physiognomy, the desire to appear as young and pleasant as possible, explains this change of attitude. As perfect as a prosthetic restoration is from a functional point of view, if it is not in accordance with the patient's physiognomy and personality, it can be considered a failure. The influence of a beautiful smile on general facial aesthetics, well-being, and self-image is quite obvious. A

beautiful, intact denture display is the key element in creating an attractive smile. The patient's ability to maintain his normal facial expression is probably the most important psychological factor for accepting fixed dentures [16,17,18]. Thus the results of our study show the following: five people dissatisfied with the aesthetic aspect, three indifferent, and the other respondents are satisfied and very satisfied in approximately equal proportions.

If we were to talk about the material (s) from which the fixed prostheses are made, 79 people in this study present metal-ceramic dentures, 27 people present metal-acrylic dentures, seven patients metallic dentures and four persons ceramic zirconium bonded. The literature states that the metal-ceramic dentures are considered the gold standard in reconstructive dentistry over decades [19,20].

Also, in the literature, we find the correlation between the social level of the patient and the materials from which the fixed prostheses are made. One aspect that should be considered in the case of a fixed denture could be the length of the reconstruction. Studies have shown a higher fracture rate as the length of the denture prosthesis increase [20-23].

It is the responsibility of the dentist to inform patients about the proper oral-dental hygiene, specific to patients with fixed restorations, which is still required to be maintained at a high rank, to prevent the pathogenicity of bacteria that is closely linked to the occurrence of caries lesions, gingivitis, and marginal periodontitis at the level of the teeth [24]. If we were to talk about the post-treatment oral hygiene measures explained by the doctor, then we can say that a relatively large number of patients, namely 23 out of a total of 117, are dissatisfied and five very dissatisfied with the doctor's instructions regarding oral hygiene dental. Also, 14 people were declared indifferent to their dental health, and the other 75 respondents replied that they were very satisfied (19) and satisfied (56). The most important finding of the present investigation: only a small part of the total group (16 persons) use complementary methods of oral hygiene daily, 57 persons use only occasionally, 44 of the 117 patients interviewed reported that they did not use

complementary methods of oral hygiene, which shows the lack of knowledge regarding the importance of maintaining the fixed prostheses; the main reason was the lack of post-treatment training, usually provided by the attending dentist, this statement is supported by data taken from the literature [16,24,25].

Epidemiological research conducted in Banat on a group of 535 patient with fixed dentures reveals interesting aspects:

- a) Almost half of the fixed prosthetic dentures were metal-acrylic, the other half being metal-ceramic and metal-composite.
- b) The number of fixed restorations in the maxillary bone (55.5%) is close to that of the mandible (44.5%). In both situations, fixed prostheses in the lateral area predominate, which suggests the predominant presence of edentation in this area.
- c) The convex shape of the intermediaries (in the ridge area), favorable for self-cleaning and sanitation was 47.1%. The concave shape of the mucosal face of the intermediates was detected in 37.9% and an inadequate form in 15% of the cases.
- d) Food retention and plaque accumulation were observed in 50.8% of patients, with 24.3% showing inflammatory signs.
- e) 85.4% of the patients in the group recognize the need for brushing and hygiene of the fixed partial prostheses; 66.6% maintain hygiene through dental brushing without respecting their correct frequency, and 27.6% have heard of the need to use dental floss [25,26].

The limits of the study would be the following: was not took into consideration the duration from the insertion of the fixed prosthetic denture, the evaluation of the abutment, of the supporting tissues, whether or not the patient showed up to regular check-ups. The sample we used to conduct the study is relatively small, and the results of this research reflect more or less the attitudes of this group of interviewees. Another side of the study that was not taken into consideration is the general health of patients. For more eloquent results, it is preferable to study a more substantial population group, collaborating with other doctors to compare the results of

the treatment performed by general practitioners with the experience of the specialist. Also, patient satisfaction assessment should be evaluated before oral rehabilitation, after insertion, one year, and three years after treatment. An important link that was not taken into consideration was the patient's educational level, given that the differences in education correspond to the different access to information and different levels of benefits from the new knowledge acquired.

The communicative behavior of patients is directly influenced by their personal and social attributes, such as educational level, age, sex, anxiety, etc. The literature shows that patients with higher education communicate more actively (ask more questions, are more aware) and express affective expressiveness, obtaining more information, but at the same time have less difficulty when interacting with the doctor. Patients from a lower social level, and doctors often find themselves in a vicious circle. These patient communications and actions (for example, fewer questions, less opinion, less affective expression, lower preference for joint decision-making) generate less physician-involved behavior, with fewer partner statements. Physicians behave differently during consultations with patients from lower social levels [27,28]. Efforts must be made to develop teaching methods, encouraging and focusing on communicating with patients in the lower social classes. Therefore, these patients should be empowered to express their concerns and preferences. It has been shown that interventions to increase the participation of patients with low studies have a good response and lead to measurable and clinically essential improvements in health outcomes [29,30].

Conclusions

1. Providing information, providing moral support, appreciating the patient's feelings, and explaining the procedures are positively related to patient satisfaction.
2. This study showed that the vast majority of patients were satisfied with all the functional aspects of their fixed prostheses.
3. Strong interpersonal skills are often the necessary element for developing confidence in the doctor, adherence to the

recommendations of care of the dentures, and the agreement with the treatment recommendations.

4. The real understanding of all aspects of the complete and integral aesthetic dentistry found in the philosophical triad represented by "health, function, and beauty" will help the dentist to provide optimal dental care.
5. Good communication within the dental team is an essential factor in improving the final result and reducing the time required to achieve the proposed goals.
6. The most important finding of this study states that a large proportion of patients showed a lack of knowledge regarding oral hygiene measures and the importance of maintaining a fixed prosthetic denture using a dental abutment. Also, it is really important to know that the majority of the doctors did not pay attention to the post-treatment instructions regarding the maintenance of a fixed prosthetic denture.

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