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REDUCE ŞI AJUTĂ LA PREVENIREA PROBLEMELOR GINGIVALE ÎN 4 SĂPTĂMÂNI PENTRU A ÎNTRERUPE CICLUL GINGIVITEI

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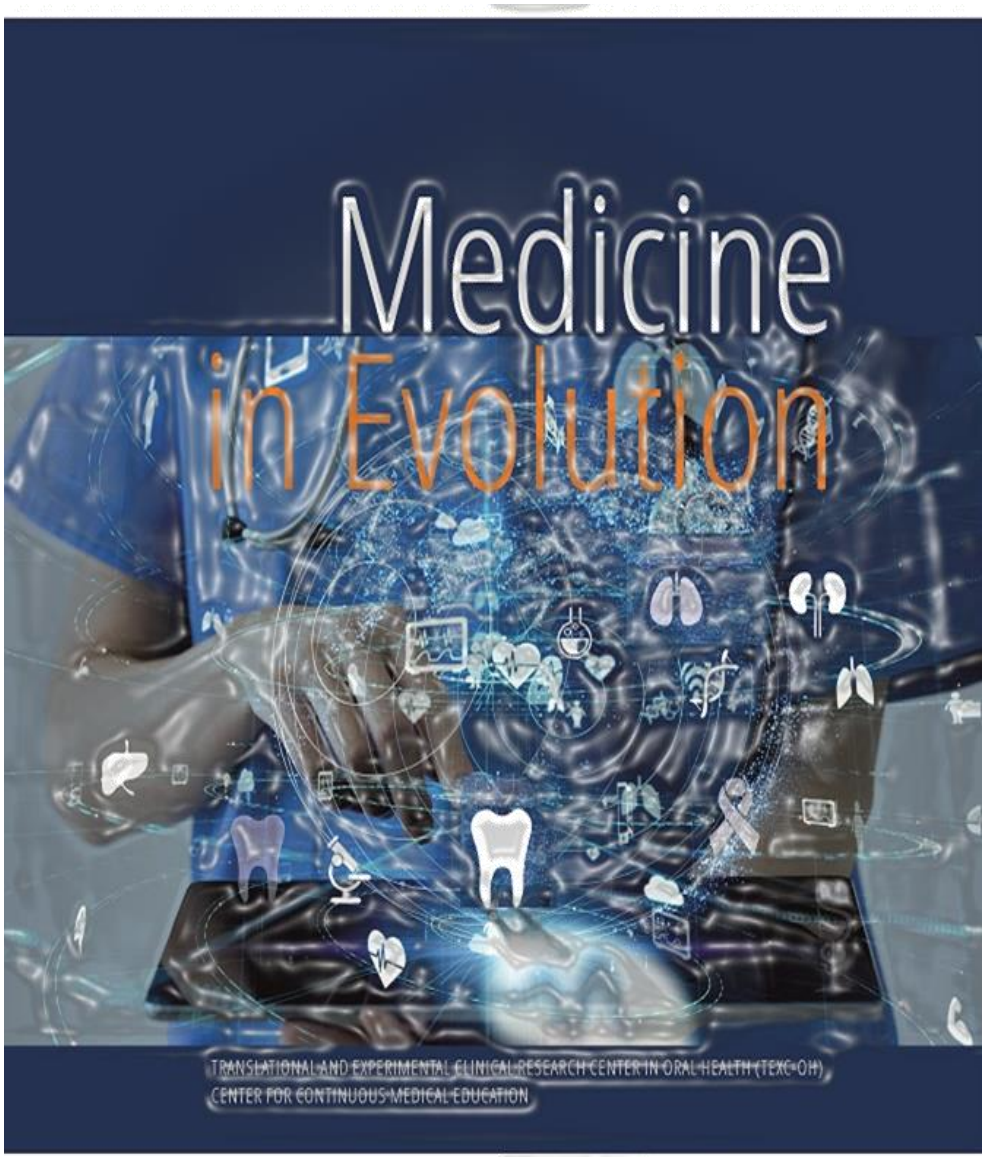

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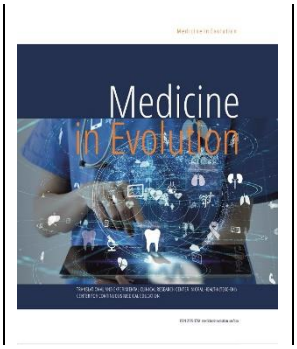

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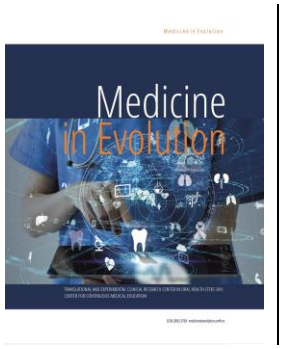

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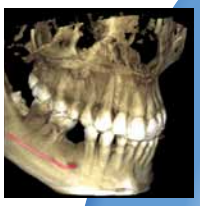

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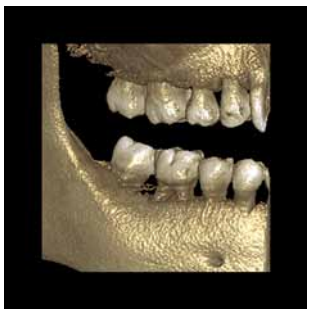

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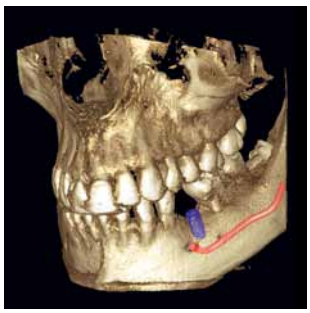

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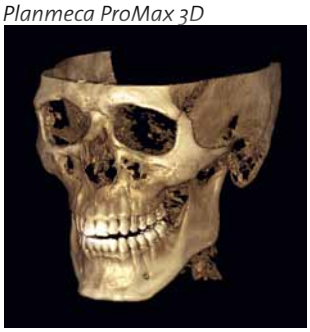

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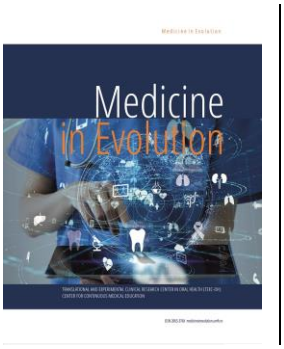
Laparoscopic incidence in acute appendicitis related to its degree of severity



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Abstract

The exact cause of acute appendicitis remains unknown, being probably multifactorial, but the inflammation of the vermiform appendix, due to luminal obstruction or dietary factors, is a major diagnostic criterion in acute appendicitis. This pathology typically presents acutely within the first 24 hours of onset, but can also present as a more chronic condition. It is currently considered that the pathological process begins after prolonged spasm of the smooth muscles and arterial vessels of the appendix. Muscle contraction leads to stasis in the appendix, spasm of the arterial vessels, ischaemia of the mucosa and, as a consequence, the primary Aschoff complex develops. Acute appendicitis is the most common surgical emergency which required the development of a predictor, represented in many studies by the disease severity score (DSS). This score can be associated with the results on the incidence of in-hospital and after hospital discharge complications, with the evaluation of the duration of hospitalization, in order to apply the most effective therapeutic methods.

Once the diagnosis of acute appendicitis has been made, the appendicectomy should be performed urgently within the first hours after hospitalization. To date, the indications for laparoscopic appendicectomy are debatable and its advantages are related to the severity of the disease.

Keywords: acute appendicitis, laparoscopic surgery, degree of severity

INTRODUCTION

Acute appendicitis is a condition often of unknown cause, but the inflammation of the appendix due to obstruction may be caused by lymphoid hyperplasia, parasitic infections, faecal matter or benign or malignant tumours. Once significant inflammation and necrosis occur, the appendix is exposed to the risk of perforation, leading to a localized abscess and sometimes open peritonitis, with a high degree of severity and risk to life [1]. The risk of rupture is variable, but is about 2% at 36 hours and increases by about 5% every 12 hours thereafter.

Appendectomy is the standard treatment for acute appendicitis. Laparoscopic approach to appendectomy is preferred over the open approach. Most uncomplicated appendectomies are performed laparoscopically.

Kumar et al., 2016, in the study on laparoscopic appendicectomy versus classical appendicectomy that evaluates the advantages and disadvantages of the two techniques, showed a lower incidence of incision infection, a low level of need for postoperative analgesics and a shorter postoperative hospital stay in laparoscopic therapy. The main disadvantage of laparoscopic appendicectomy is the longer operative time, but it offers less pain, faster recovery and the ability to explore most of the abdomen through small incisions. Cases where there is an abscess or advanced infection may require an open approach [3].

Many large studies show that simple appendicitis associated with a low degree of severity, treated either by open surgical therapy or by laparoscopy, has excellent results [4]. Determining and reporting disease severity in emergency appendectomy is not standardized, but a severity grading system that strongly correlates with laparoscopy of acute appendicitis is needed [5].

Aim and objectives

The aim of this study is to evaluate the laparoscopic incidence in acute appendicitis in relation to disease severity. The optimal laparoscopic approach of acute appendicitis involves precise identification of risk factors, clinical and pathological features based on laboratory examination, the most accurate diagnosis rate and the treatment administered. Any factor that leads to a complicated pathological picture induces a higher degree of severity. This fact will effect the incidence of laparoscopy in the therapeutic management of acute appendicitis, aiming at reducing pre- and postoperative complications among the studied population.

Objectives: Laparoscopic incidence and its benefits in acute appendicitis (AA) according to severity score related to gender; Laparoscopic incidence and its benefits in acute appendicitis (AA) according to severity score related to age; Laparoscopic incidence and its benefits in acute appendicitis (AA) according to severity score related to age and gender.

MATERIAL AND METHODS

A retrospective study was used to achieve the proposed objectives. In this regard, a group of 171 patients diagnosed with acute appendicitis was created.

The material basis of the study included the patients' medical records from the hospital archives, respectively the computerized data of the two units, the County Emergency Clinical Hospital from Oradea and the Pelican Hospital from Oradea.

The data obtained were statistically interpreted based on the determination and calculation of a series of specific analysis indices.

RESULTS

Almost 30% (29.24%) of the total number of patients included in the study group suffered from acute appendicitis in 2017. In 2020, approximately 20% (19.88%) of the total. In 2018 and 2019, the number of patients with acute appendicitis decreased by half compared to 2017, reaching values of 16.95%, respectively 15.78% (Table 1).

Table 1. Percentage of operated AA out of total AA/year by severity score

Year	Mild AA		Severe AA		Total	
	No.	%	No.	%	No.	%
2017	26	25.74	24	34.28	50	29.24
2018	16	15.84	13	18.57	29	16.95
2019	16	15.84	11	15.71	27	15.78
2020	30	29.70	4	5.71	34	19.88
2021	13	12.87	18	25.71	31	18.13
2017-2021	**101**	**100**	**70**	**100**	**171**	**100**

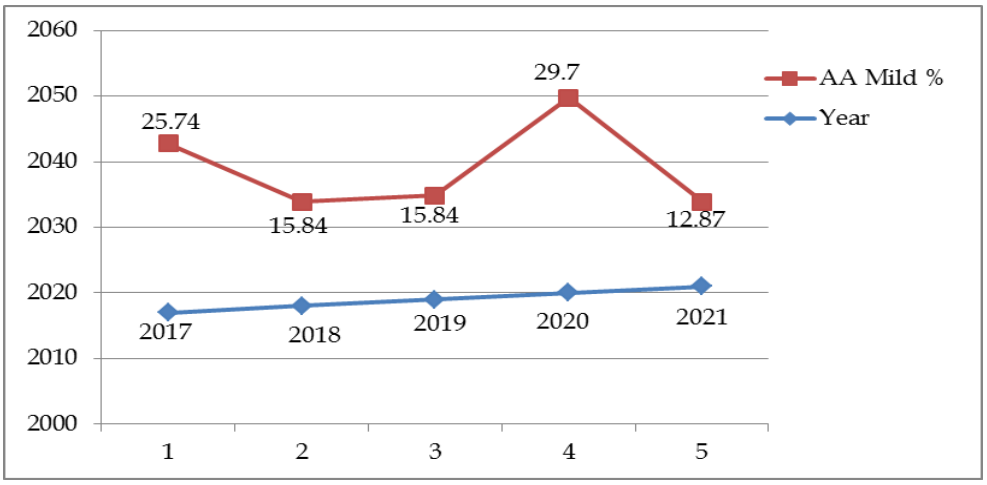

Figure 1. The percentage of acute appendicitis with mild severity score

The percentage of acute appendicitis (Fig. 1) with mild severity score was of 29.70% in 2020, a percentage that in 2017 decreased to 25.74%. In the analysed period, the lowest percentage of 12.87% was registered in 2021.

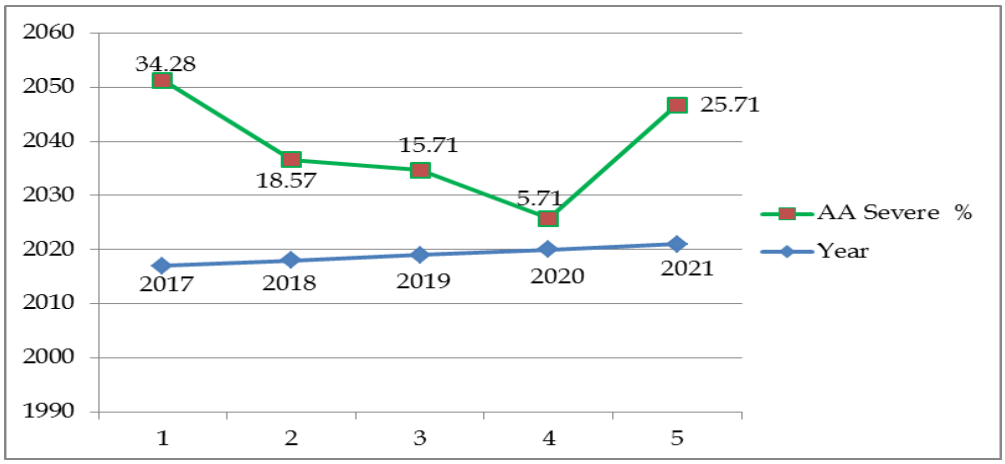

Figure 2. The percentage of acute appendicitis with severe severity score

In acute appendicitis with increased severity, the highest percentage was recorded in 2017 (34.28%) and the lowest in 2020 (5.71%) (Fig. 2).

Table 2. The percentage of operated AA by severity score in relation to gender

Year	Gender	Mild AA		Severe AA		Total	
		No.	%	No.	%	No.	%
2017-2021	F	55	54.45	34	48.57	89	52.04
	M	46	45.54	36	51.42	82	47.95
	TOTAL	101	100.00	70	100.00	171	100.00

Mild acute appendicitis showed increased incidence in female patients, 54.45% compared to male patients. In the case of severe acute appendicitis, the percentage was higher among male patients, 51.42%. The highest percentage of acute appendicitis related to gender was recorded in female patients, 52.04% (Table 2).

The percentage of mild acute appendicitis was the highest in patients under 20 years of age, 28.71%. The same ascending trend was observed in the case of patients aged 21-30 years, 22.77% (Table 3).

Table 3. The percentage of operated AA by severity score in relation to age

Year	Age group	Mild AA		Severe AA		Total	
		No.	%	No.	%	No.	%
2017 - 2021	<20 years	29	28.71	11	15.71	40	23.39
	21-30 years	23	22.77	14	20.00	37	21.63
	31-40 years	16	15.84	17	24.28	33	19.29
	41-50 years	17	16.83	10	14.28	27	15.78
	51-60 years	9	8.91	10	14.28	19	11.11
	61-70 years	5	4.95	6	8.57	11	6.43
	>70 years	2	1.98	2	2.85	4	2.34
TOTAL		101	100.00	70	100.00	171	100.00

Severe acute appendicitis had the highest percentage in patients aged 31-40 years, 24.28%. This percentage was also high in patients aged 21-30 years, 20% (Table 3).

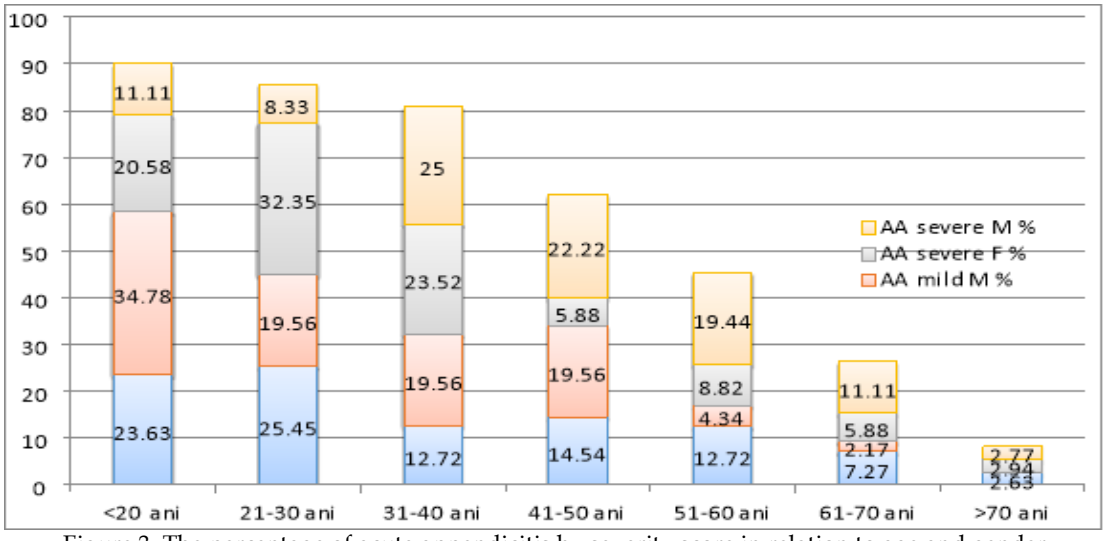

Figure 3. The percentage of acute appendicitis by severity score in relation to age and gender

The majority of the patients with mild appendicitis from both groups, women's group and men's group, was under 20 years of age and between 21-30 years, 49.08% and 54.34%, respectively (Fig. 3).

Most female patients with severe appendicitis were aged between 21-40 years, 55.87% and most male patients with severe appendicitis were aged between 31-50 years, 47.22%.

DISCUSSIONS

Several studies in the literature suggest that the laparoscopic approach for performing appendicectomy (LA) presents many advantages such as faster recovery, fewer postoperative complications, better aesthetic impact, less postoperative pain and shorter hospital stay [6, 7].

Acute appendicitis with higher severity score is more common in patients aged 21-40 years regardless of gender. Compared to conventional surgery, postoperative recovery is faster in the case of laparoscopic procedure.

The number of patients from the laparoscopic study group, diagnosed with severe acute appendicitis, converted to the conventional procedure was insignificant.

The retrospective cohort study on whether the laparoscopic approach should be proposed as the gold standard in acute appendicitis conducted by Guercio et al., 2016 concluded that the most relevant factor studied was the reduction in the conversion rate for laparoscopic approach. No significant differences were found concerning the length of the procedure and the length of the hospital stay between the two groups. The rate of complications was very low in both groups.

This study also looked at the frequency with which experienced surgeons can apply such a procedure to obtain all the advantages of this technique in order to highlight whether laparoscopy of acute appendicitis can become the gold standard in treating this surgical emergency [8].

A very important result observed in the study "Risk Factors for Future Repeated Abdominal Surgery" to be highlighted is the significant reduction in the conversion rate for laparoscopic approach, which allows the safe performance of even "difficult" appendectomies such as retrocaecal or infrahepatic appendicitis. Possible complications due to abdominal incisions, especially in case of large incisions and contaminated surgical field, are very well-known [9].

At first, these advantages were confirmed for uncomplicated appendicitis [10]. Current evidence has shown several advantages of LA even for complicated appendicitis. These advantages are should be considered as the minimum incision is associated with a significantly lower rate of surgical infection [11]. Consequently, although appendicectomy is considered a simple and safe procedure, diagnostic certainty and safe and correct surgical procedure are needed [12].

Other studies have reported that laparoscopic appendicectomy is associated with a higher rate of complications and higher costs than the conventional procedure [12], although the advantages of the laparoscopic approach (optimal abdominal cavity exploration, fast recovery) are highlighted in cohort studies [7]. Both techniques proposed in the specialized studies may change results in terms of patient comfort, complications and costs [13].

Conventional surgical technique is commonly adopted in many cases [14]. The three-port laparoscopic procedure is frequently used for cholecystectomy, but also for appendicectomy and other abdominal procedures presented in the study on the laparoscopic treatment of a large pedunculated hemangioma of the liver [15].

Laparoscopic appendectomy can be adopted in all stages of severity of acute appendicitis, including diffuse peritonitis.

CONCLUSIONS

The incidence of laparoscopic appendectomy in severe acute appendicitis in the study group was higher in the 21-40 age group.

The incidence of laparoscopic appendectomy in mild acute appendicitis in the study group was higher in patients younger than 20 years of age.

Severe acute appendicitis, treated laparoscopically, had a higher incidence in female patients, reaching the percentage of 55.87%.

In both the female and the male group, the incidence of mild appendicitis was higher in patients under 20 years of age and in patients between 21-30 years of age, being of 49.08% and 54.34%, respectively.

The incidence of laparoscopic appendectomy in acute appendicitis by severity score in relation to age and gender in the study group was higher in the case of female patients as opposed to male patients.

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Nosocomial infections in critically ill Covid-19 patients

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Abstract

Nosocomial infections follow the medical practice as a shadow, being present in medical systems worldwide, even in high-performance ones, being a public health problem because it is due to germs resistant to antimicrobials. In the critically ill Covid 19 patient, assisted in the intensive care units, where is subjected to invasive procedures, nosocomials become life-threatening. In 2021, 586 severe and critical Covid_19 cases were treated, the prevalence of nosocomiality being 10.23%. At a severe Covid 19 fatality rate was 70.72%, and reached 88.33% in health-care associated infections. *Acinetobacter baumanii* and *Klebsiella pneumoniae*, resistant to cephalosporins, aminoglycosides, quinolones, carbapenems and even polymyxin b, were frequently involved, identified especially in tracheobronchial secretions, Odds ratio for antimicrobial resistance being 4.3929 compared to other specimens (P = 0.015). It turns out that empirical antibiotic therapy, asepsis and antisepsis in intensive care need to be reconsidered.

Keywords: nosocomial infections, antimicrobial resistance, Covid 19

INTRODUCTION

Nosocomial infections, officially called Healthcare-associated infections (HAI) [1], accompany as a shadow the medical practice worldwide, being usually generated by multidrug resistant germs (MDR) with hospital habitat, are constantly present in the medical departments, especially in those that involve numerous invasive procedures; they often have unfavorable developments, especially in elderly, immunocompromised patients with comorbidities or other pre-existing infections. In addition, nosocomial infections become life-threatening if antimicrobial-resistant germs are involved. Antimicrobial resistance (AMR) is a common occurrence in medical systems, and multidrug resistance (MDR), which is AMR in over 3 classes of antimicrobials, is a public health issue. Severe Covid_19 infections are treated in intensive care units (ICUs) and can progress critically rapidly, especially if they are associated with a superbug infection with MDR germs.

Aim and objectives

We identified HAI cases in Covid_19 patients in ICU and the MDR profile of isolates from specimens, to assess the circulation of in-hospital germs.

MATERIAL AND METHODS

In eight months of 2021 (01.01-07.06.2021 and 18.09-31.12.2021) 70 germs were isolated from 60 Covid_19 patients defined as HAI, in the ICU 1 departmentof the Arad County Hospital, where were assisted a total of 586 Covid_19 cases. Patient demographics, specimen type, and germ MDR attributes were analyzed with Microsoft Excel, MedCalc, and IBM SPSS Statistics 24. Statistical analysis goal was to determine the frequency of isolated germs in ICU 1 versus other sections using Pareto charts and the association of variables.

RESULTS

The data were analyzed in the context in which 3662 germs were isolated, in 2021, in the entire hospital unit, of which 47% displayed MDR characters (n = 1718). Specimens from sections other than ICU 1 showed MDR in 40.46% of cases. In ICU 1, MDR reached 62%. In HAI from ICU 1 MDR reached 67.14%, table 1 and image 1.

Table 1. Numerical and percentage distribution of MDR germs in the hospital and ICU 1

Year 2021	nonMDR	MDR	Total	%MDR
Hospital, all units	1934	1718	3652	47.04
Other dept. but ICU1	1510	1026	2536	40.46
ICU 1	424	692	1116	62.01
HAI ICU 1	23	47	70	67.14

Legend: HAI= Healthcare-associated infections, ICU 1=Intensive Care Unit 1, MDR= multidrug resistant

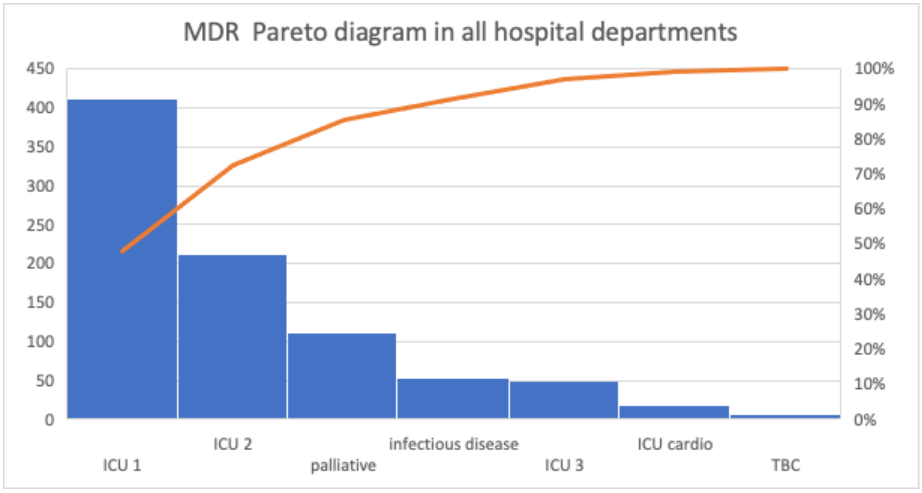

Figure 1. Multidrug resistance, distribution by hospital departments

Gram-negative (GNB) and Gram-positive (GPB) bacteria were relatively balanced in ICUs versus other departments, Table 2, but the MDR percentage of GNB in ICU 1 is significantly increased for *Acinetobacter baumanii, A. calcoaceticus* and *Klebsiella pneumoniae*, Table 3 and image 2.

Table 2. Percentage distribution of total GNB in ICUs versus other departments

item	GNB	GPB	total	%GNB
Other departments	1719	814	2533	67.86
ICUs	747	372	1119	66.75

Legend: ICUs= Intensive care units, GNB=Gram negative bacteria, GPB=Gram positive bacteria

Table 3. Multidrug resistance total and percentage for GNB in ICUs and other departments

Bacteria	MDR total	MDR_ICUs	% MDR_ICUs
Acinetobacter baumanii,, A.calcoaceticus	223	188	84.30
Klebsiella pneumoniae	301	149	49.50
Proteus penneri, P. rettgeri	222	60	27.03
Morganella morganii	42	9	21.43
Serratia marcescens	29	4	13.79

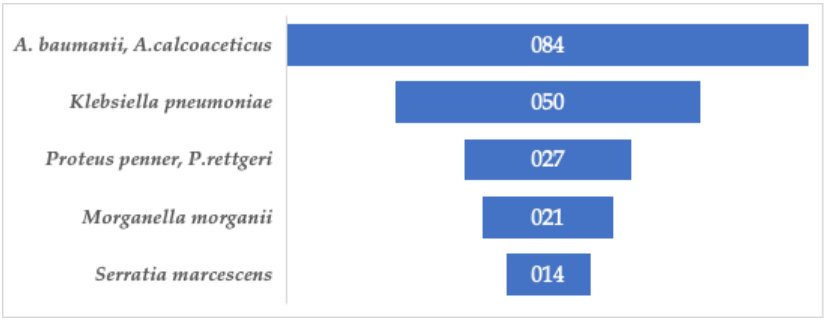

Figure 2. Percentage of Gram-negative bacteria in intensive care units

Average age of HAIs patients was 69 years, extreme 44-85 years. Gender ratio F: M = 1.22. HAI prevalence in Covid_19 patient= 10.23%. In more than half of the HAI cases, Gram-negative bacteria were isolated (n = 43)), especially *Acinetobacter baumanii* (40%) and *Klebsiella pneumoniae* (11.6%), with AMR reaching 79%. Gram-positive GNP germs (n = 27) were represented by enterococci (n = 16) and staphylococci (n = 11), with AMR 92.85%, especially in tracheobronchial specimens and blood cultures.

Table 4. Distribution of antimicrobial resistant bacteria

Bacteria	non AMR	AMR	%AMR	total	%total
Acinetobacter baumanii	6	22	79	28	40
Aeromonas veronii	0	1	100	1	1.4
E coli	1	1	50	2	2.9
Enterococcus faecalis	7	0	0	7	10
Enterococcus faecium	0	4	100	4	5.7
Enterococcus spp	4	1	25	4	5.7
Klebsiella oxytoca	0	1	100	1	1.4
Klebsiella pneumoniae	0	8	100	8	11.4
Pseudomonas aeruginosa	0	1	100	1	1.4
Staphylococcus aureus	3	1	25	4	5.7
Staphylococcus epidermidis	0	1	100	1	1.4
Staphylococcus haemolyticus	0	6	100	6	8.6
Stenotrophomonas maltophilia	2	0	0	2	2.9
Total	23	47	67	70	100

The most frequent specimens for MDR germs in HAI were tracheobronchial secretions, Table 5. The odds ratio (OR) for MDR in tracheobronchial specimens is 4.3929 (P = 0.0155) compared to other specimens, Table 6. Tracheobronchial specimens are most commonly positive for SARS_CoV-2 in lower respiratory tract infections in adult cases, but in children the situation is in negative concordance with nasopharyngeal secretions, say some researchers [2].

Table 5. Distribution of antimicrobial-resistant bacteria in specimens

Ítem	Non AMR	AMR	total
Blood	2	3	5
Wound	1	1	2
Pus	1	0	1
pharyngeal exudate	5	0	5
tracheobronchial secretion	14	41	55
Urine	0	2	2
Total	23	47	70

Table 6. Odds ratio AMR in tracheobronchial secretions

Odds ratio AMR tracheobronchial secretion versus other specimens	4.3929
95% CI	1.3257 to 14.5557
z statistic	2.421
Significance level	P = 0.0155

Antibiotic resistance for *Acinetobacter baumanii* and *Klebsiella pneumoniae* has been demonstrated for cephalosporins, aminoglycosides, quinolones, carbapenems and even polymyxin b, these two germs manifested this tendency decades ago [3], Table 7.

Table 7. Antibiotic resistance for *Acinetobacter baumanii* and *Klebsiella pneumoniae*

GNB	*Acinetobacter baumanii*	*Klebsiella pneumoniae*
total	28	8
cephalosporins	4	8
aminoglycosides	28	7
quinolones	28	5
carbapenems	28	8
polymyxin b	2	3

Legend: GNB=Gram-negative bacteria

The Covid_19 fatality rate is 70.72% and reaches 88.33% in HAI with Covid_ 19 (n = 53). Comorbidities due to diabetes, hypertension and obesity (n = 44) are risk factors for death (n = 38), the fatality rate in patients with these pre-existing conditions being 86.36%. Deaths in HAIs cases with MDR is n = 37 of n = 53 (69.81%).

DISCUSSIONS

Nosocomial infections in ICUs are much more common than in other hospital departments worldwide, because patients are in critical condition, requiring invasive interventions and the risk of being inseminated with resistant germs is much higher. The literature is not very abundant in articles investigating whether SARS CoV 2 has anything to do with the vulnerability of these patients to associated infections, opinions being divided; in general COVID-19 patients seem to be more predisposed to catheter-associated urinary tract infection despite a higher proportion of non-COVID-19 patients having urinary catheters, which is not valid in ICUs [4]. On the other hand, hospital care did not benefit from new hospitals, specially dedicated to Covid 19 patients, hospitalization being carried out in the same congested conditions and sometimes deficient in human resources and materials, which maintains the risks of associated infections.

Although the years 2020-2021 were mainly dedicated to the Covid 19 patient, MDR bacteria continued to be present at an increased rate for those resistant to cephalosporins, aminoglycosides, quinolones, carbapenems and even polymyxins b. This may be due to the empirical use of antimicrobials and requires dedicated studies. Pan American Health Organization has a valuable study on this issue (Document Number)

PAHO/CDE/AMR/COVID-19/22-0006), which we quote in full, considering it covering also in terms of conclusions: "The COVID-19 pandemic has fueled the ongoing antimicrobial resistance (AMR) global crisis due to the increase in the use of antibiotics to treat COVID-19 patients, disruptions to infection prevention and control practices in overwhelmed health systems, and diversion of human and financial resources away from monitoring and responding to AMR threats. Moreover, AMR is likely to have caused more COVID-19 deaths, as secondary bacterial infections can worsen the outcome of severe and critical COVID-19 illness. Therefore, it is more urgent than ever to prioritize efforts towards AMR containment and support countries to improve the detection, characterization and rapid response to emerging AMR. This policy brief compiles strategic information for policy and decision makers to continue prioritizing the AMR response and implementation of developed national action plans on AMR while ensuring that adequate resources are allocated to the latter. It also encourages countries to measure and monitor the impact of the COVID-19 pandemic on AMR epidemiology in the region." [5].

Nosocomial infections in intensive care units were due to germs with high rates of resistance over 67%. The association of pandemic viral infection with multidrug-resistant bacteria in nosocomial infections mainly affects Covid_19 patients over 65 years of age, whose critical evolution requires intubation and assisted ventilation, which are perfect conditions for the development of "supebugs" in tracheobronchial secretions.

CONCLUSIONS

Antibiotic resistance of isolates from hospital-associated infections increases the risk of death, which means that empirical antibiotic therapy, asepsis, and antisepsis in ICUs need to be reconsidered. Across the EU, 25,000 people die each year from drug resistant infections [6], and prognosis look likea worldwide, this number will increase to 10 million by 2050[7].

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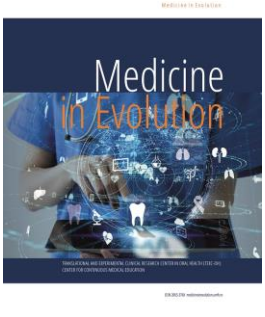
Mechanisms Of Oxidative Stress and Maternal-Fetal Involvement



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Abstract

Oxidative stress is manifested at the maternal-fetal interface from the beginning of pregnancy. It plays a role both in the normal development of the placenta and in the pathophysiology of complications: miscarriage, preeclampsia, intrauterine growth restriction (IUGR) and premature rupture of membranes. We studied from an immunohistochemical point of view nine placentas from pregnant women between the ages of 35 and 40 who had miscarriages in the absence of an obvious medical cause with a control group consisting of 9 normal, up to term placentas. We studied the anti-Gluthatione antibody and METH1 patterns of staining. The results showed an obvious association of low values of GLUTH and METH1 with miscarriages.

Keywords: oxidative stress, miscarriages, superoxide radicals, preeclampsia

INTRODUCTION

Oxidative stress is a process generated by the imbalance between the production and accumulation of reactive oxygen species (by-products of oxygen metabolism) in cells and tissues and the ability of a biological system to detoxify these reactive products. Even though oxidative stress is a pathological condition, harmful to the human body, is sometimes used as a treatment for some conditions, such as cancer, with a certain degree of clinical success. [1]

Free radicals are molecules that contain oxygen with an unequal number of electrons which allows them to easily interact with other molecules, sometimes causing chain reactions, oxidation reactions. They can be beneficial or, on the contrary, harmful. Superoxide radicals (O2-), hydrogen peroxide (H2O2), hydroxyl radicals (OH-) and singlet oxygen (^{1}O2) are reactive oxygen species (ROS). ROS results from metabolic processes mainly in mitochondria, both physiologically and pathologically. [2,3,4] The production of reactive oxygen species is mainly based on enzymatic and non-enzymatic reactions. The enzymatic reactions capable of generating ROS are those involved in the respiratory chain, prostaglandin synthesis, phagocytosis and the cytochrome P450 system. [5-15] Superoxide can also be generated by the leakage of electrons from the shorter electron transport chain within the endoplasmic reticulum (ER). [16] Other sources of superoxide under physiological conditions are: the enzyme nicotinamide adenine dinucleotide phosphate (NADPH) oxidase, which generates substantial amounts throughout pregnancy, but especially at the beginning of gestation, cytochrome P450 and other redoxases. Various growth factors, drugs and toxins cause an increase in the amount of ROS. [17,18] Superoxide is converted by superoxide dismutase enzymes to hydrogen peroxide. Hydrogen peroxide is not a free radical, so it is less reactive than superoxide. However, it is included in the term ROS because it is closely involved in the generation and detoxification of free radicals. Because it is nonpolar, it is able to diffuse across cell membranes and therefore acts as a second-order messenger in signal transduction pathways. [5-15]

Antioxidants are molecules that can donate an electron to a free radical without losing its stability. Following such a reaction the free radical stabilizes and becomes less reactive. Cells initiate an antioxidant defense system based primarily on enzymatic components, such as superoxide dismutase (SOD), catalase (CAT), and glutathione peroxidase (GPx), to protect against cell damage induced by reactive oxygen species. [19] Superoxide is converted to hydrogen peroxide by two isoforms of superoxide dismutase (SOD): manganese SOD which is limited to mitochondria and copper-zinc SOD which is in the cytosol. Catalase or glutathione peroxidase (tetrameric selenoprotein) breaks down hydrogen peroxide into water. The activity of glutathione peroxidase depends on the presence of reduced glutathione (GSH) as a hydrogen donor.[20]

Oxidative stress is manifested at the maternal-fetal interface from the beginning of pregnancy. It plays a role both in the normal development of the placenta and in the pathophysiology of complications: miscarriage, preeclampsia, intrauterine growth restriction (IUGR) and premature rupture of membranes. [21,22] It is accepted that placental development takes place at a relatively low concentration of oxygen, being supported by the secretions of the endometrial glands rather than by the maternal circulation. [23,24] Other researchers suggest that this environment protects the developing embryo from oxygen free radical-mediated teratogenesis. [25] The onset of circulation is associated with a tripling of the oxygen concentration in the placenta. [22] This will stimulate higher rates of generation of reactive oxygen species, especially in the critical syncytiotrophoblastic layer, at which the concentrations of antioxidant enzymes, copper-zinc superoxide dismutase and catalase are low. Consequently, the villi taken from the peripheral region of the placenta have high levels

of chaperone HSP70, nitrotyrosine residues - which indicate the formation of peroxynitrite - and reveal degenerative morphological changes in the syncytiotrophoblast, compared to specimens taken from the central region. Molecular evidence confirms that this apoptotic cascade is activated in peripheral villi and that this would be sufficient to explain their regression. [34-36]

Aim and objectives

It is known that the Glutathione (GLUTH) acts to minimize the oxidative stress in the tissue and it's protective mechanism is corelated with it's high expression. We aimed to quantify and prove this expression in case of miscarriages of unknown causes and also to analyze methionine synthase reductase (METH1) behavior from an immunohistochemical point of view.

MATERIAL AND METHODS

Our study consisted of a pilot group of nine placentas from pregnant women between the ages of 35 and 40 who had miscarriages in the absence of an obvious medical cause. The second group was represented by the control group consisting of 9 placentas from patients aged between 35 and 40 who had normal up to term gestation periods and gave birth to healthy children.

An immunohistochemical analysis was performed on 4 µm-thick sections prepared from formalin-fixed paraffin- embedded tissue by using an automated immunostainer (Bechmark XT, Ventana Medical Systems Inc., Tucson, AZ, USA). Immunohistochemical assays were performed on a Ventana Benchmark XT automated staining instrument according to the manufacturer's instructions. Slides were deparaffinized using EZprep solution (Ventana Medical Systems, Inc.) at 900C, and all reagents and incubation times were chosen as directed on antibody package inserts. Slides were developed using the OmniMap DAB (3,3'- diaminobenzidine) detection kit (Ventana Medical Systems, Inc.) and counterstained with Hematoxylin. [26-28] Sections were incubated with anti-Gluthatione primary polycloclonal antibody (ab9443, rabbit, IgG, cytoplasmatic, Abcam, Cambridge, CB2 0AX, UK) in accordance with the manufacturer's protocol.[29] The second antibody was METH1 (methionine synthase reductase) for sections incubation (primary polycloclonal antibody, rabbit, IgG, cytoplasmatic, Abmart,219 McMane Avenue, Berkeley Heights, NJ 07922, US) in accordance with the manufacturer's protocol. [30] Negative control was undertaken by omitting the primary antibody on the same section type. The specimens were analyzed by two skilled pathologists and were double blinded according with H score. The H score is determined by multiplying the percentage of cells demonstrating each intensity (scored from 0 to 3) and adding the results. There are 300 possible values. In this system, <1% positive cells is considered to be a negative result.[31] We used Leica DM3000 led microscope with intelligent automation and LAS EZ software (provided by Leica Biosystem) for capture of images and measurements.

RESULTS

The following table shows the H scores for each patient in both the control group and the study group. Glutathione expression is very high in the control group compared to the study group. In the latter there are values ranging from 0 to 205. (Table 1)

Table 1. Dispersion of H score values in the two studied groups

Nr crt	0	1+	2+	3+	**H-score**	**STUDY GROUP H Score**
1	90	10	0	0	**10**	290
2	0	0	0	0	**0**	290
3	0	0	0	0	**0**	295
4	0	20	55	25	**205**	285
5	80	20	0	0	**20**	280
6	0	80	20	0	**120**	290
7	0	0	0	0	**0**	280
8	0	35	35	30	**195**	295
9	0	0	0	0	**0**	295
Average					**61.11**	288.88

The comparative evaluation of the average values from the two groups shows us that the value in the study group is almost 5 times lower, which is associated with an increased oxidative stress.

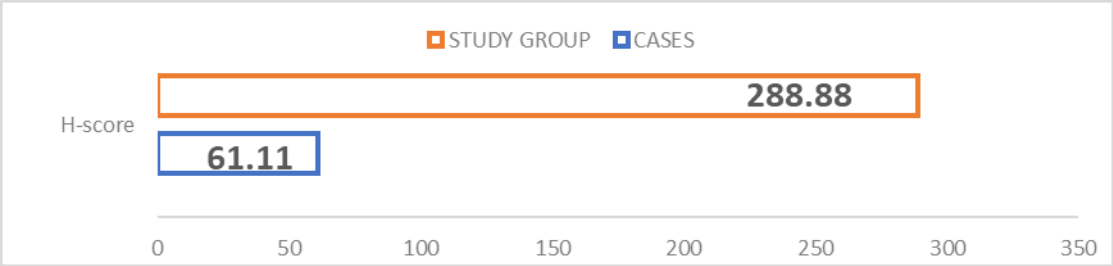

Figure 1. The average values of the H score in the groups included in the study

Analysis of mean values for METH1 revealed a smaller difference in the group of patients with comparative miscarriage compared to patients in the control group. (Fig. 2) The dispersion of the absolute values of the H score in the studied group is much smaller compared to the dispersion of the values obtained in the case of GLUTH. (Fig.3) The minimum value was 10 and the maximum was 280. (Table 2)

It's easily noticeble that in a case of miscarriage the value obtained was higher than the average value of the H score obtained in the control group.

Table 2. Dispersion of H score (METH1) values in the two studied groups

Nr crt	0	1+	2+	3+	**H-score**	**STUDY GROUP H score**
1	0	0	20	80	**280**	285
2	30	40	25	5	**105**	270
3	10	35	30	25	**170**	275
4	0	10	40	50	**240**	295
5	40	50	10	0	**70**	285
6	0	25	25	50	**225**	235
7	90	10	0	0	**10**	280
8	10	30	30	30	**180**	210
9	10	45	25	20	**155**	295
Average					**159.44**	270

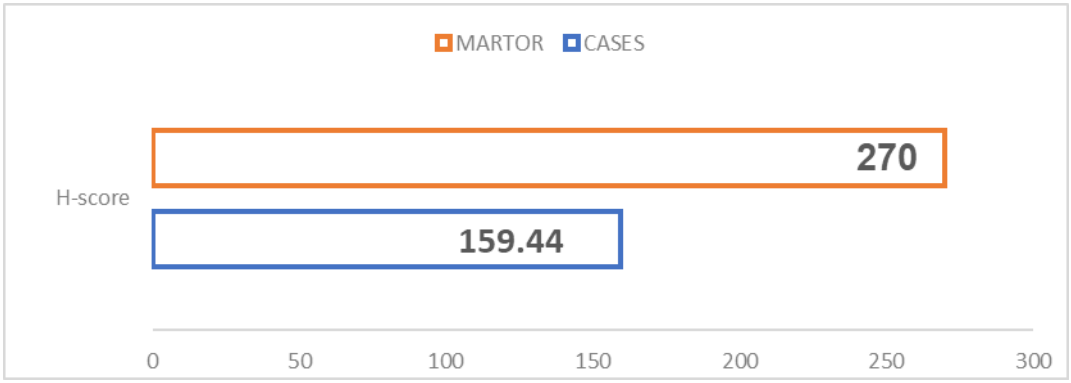

Figure 2. The average values of the H score (METH1) in the groups included in the study

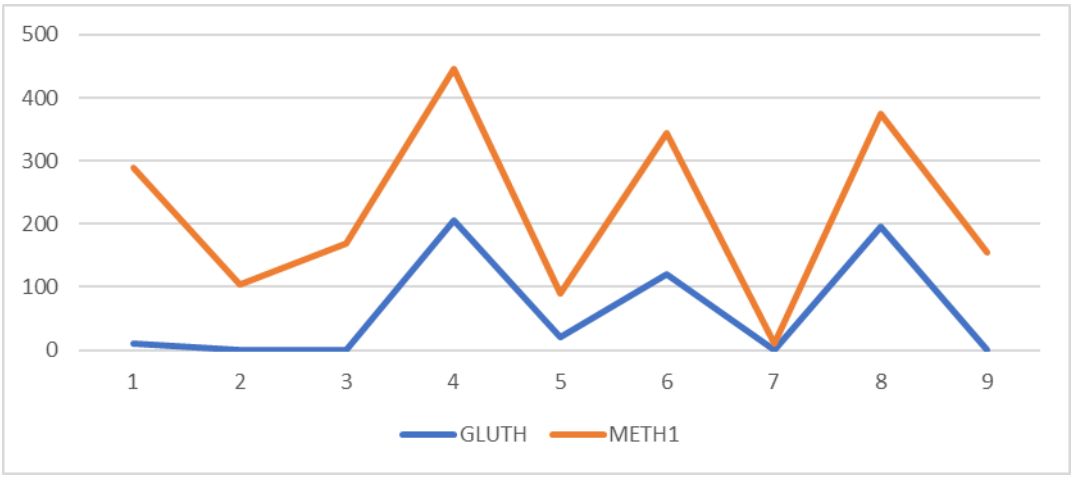

Figure 3. Dispersion of H score (METH1/GLUTH) values in the two studied groups

DISCUSSIONS

The concept of pro-oxidant-antioxidant balance is essential for understanding oxidative stress for several reasons. First, this concept emphasizes that the disturbance can be caused by changes that can occur in either part of the balance: like abnormally high generation of ROS, or deficiencies in antioxidant defense, or structural changes occurred in proteins or potentially conformational isomers that could cause their enzymatic activity to be lost or to be impaired. [15.32] Uncontrolled, oxidative stress and/or decreased protective mechanisms, and therefore glutathione levels (as our results have also sugested) can be responsible for inducing several conditions, both chronic and degenerative, can accelerate the aging process, are associated with cancer, Parkinson's disease, Alzheimer's disease and can also cause acute conditions (e.g. stroke). [37,1] The concept of equilibrium draws attention to the fact that there will be a gradual response to oxidative stress. Therefore, minor balance disturbances can lead to homeostatic adjustments in response to changes in the immediate environment, while major disturbances can lead to irreparable damage and cell death. The line between physiological and pathological changes is difficult to specify. It is currently estimated that complex interactions occur between oxidative stress and other forms of cellular stress, such as endoplasmic reticulum (ER) stress. [33]

It is known that the glutathione acts to minimize the oxidative stress in the tissue. The results obtained by us reveal a very high H score of GLUTH expression for patients who gave birth at term, almost 5 times fold (4,71x) then for patients with miscarriages. The high expression of glutathione is associated with a very high antioxidant protection mechanism. The analysis of the results obtained in the group of patients with miscarriages reveals that in 6

cases included in the study the values of the H score is 0 or close to 0. It is obvious that in these cases there was no antioxidant protection or it was very low being below the sensitivity limit of the method used. All this leads us to believe that the values of oxidative stress are high in miscarriages. In several studies, the decrease or enzyme deficiency of methionine synthase reductase is associated with an increase in homocysteine values, associated with blindness, neurological symptoms, atherosclerosis, congestive heart failure, age-related disease and birth defects.[38].

The results obtained by us are consistent with studies conducted so far. For patients with miscarriages, there is a low value of methionine synthase reductase compared to the results obtained in the control group. The analysis of the mean values of the H score in the case of METH1 in the groups included in our study reveals a decrease of 41% in the values in the case of spontaneous abortions compared to the control group. The comparative distribution of curves for GLUTH and METH1 reveals a parallel between the mechanisms of antioxidant protection. Low glutathione levels have been associated with low methionine synthase reductase levels which validates our results. Unfortunately for our pilot study, the results may be obscured by the small number of cases studied. For this reason, we believe that further research needs to be done in the future.

CONCLUSIONS

The results we obtained highlights, as expected, that low values of Glutathione (GLUTH) are associated with miscarriages but also the values of Methionine Synthase Reductase (METH1) in such conditions are low.

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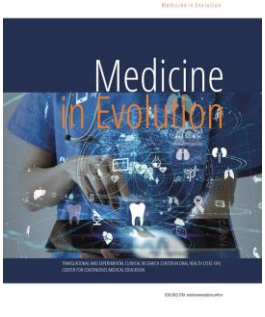
The role of nurses in the management of postpartum depression



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Abstract

This study has been carried out with the aim of investigating the level of knowledge of the nurses and their role in the management of post-partum depression. Participants were 73 professional nurses, and the data were collected through a questionnaire formed out of 16 questions.

73 nurses were interviewed, consider that they were not properly prepared for this role and they were not able to identify and manage the patients with post-partum depression. They also consider that the ideal training should contain more theoretical information. A part of the nurses (32, 87%) do not know the symptomatology, and 38,35% are not aware of the risk factors of post-partum depression.

Postpartum depression is seen in approximately 10% of women who have recently given birth, but also in 3, 3% of men. Despite of this numbers, the Romanian medical personnel is not yet well prepared in facing this affection.

Keywords: post-partum depression, nursing, management of post-partum depression

INTRODUCTION

Nurses specializing in maternal and child care are poised to play a pivotal role in the early identification and prompt treatment of perinatal depression [1-4].

Postpartum period it is well-known for presenting high-risk for the appearance of a mental illness. Recent studies shows that in 13% of women occurs during the first year of postpartum period, and 20% in the first trimester. Their depression can, in some cases, also adversely affect their infants; given the potential serious consequences of postpartum depression, it is imperative that health professionals caring for mothers of infants appropriately manage this disorder [5-7].

Aim and objectives

The present study is observational and aims to analyze the level of knowledge of nurses and their role in the management of patients with postpartum depression.

MATERIAL AND METHODS

The assessment instrument is a questionnaire which contains 16 questions about post-partum depression and the management of it. The questionnaire is structured on three parts: general information about the participants, the nurse's knowledge about the postpartum depression, and the identification and the management of the patient's cases. For this, we choose a sample made out of 73 participants.

RESULTS

Participants in this study were asked if they consider that more theoretic information is needed, in order to be able to identify and help women with postpartum depression. Of the 73 nurses, 53 answered yes, and the other 17 consider that they do know enough.

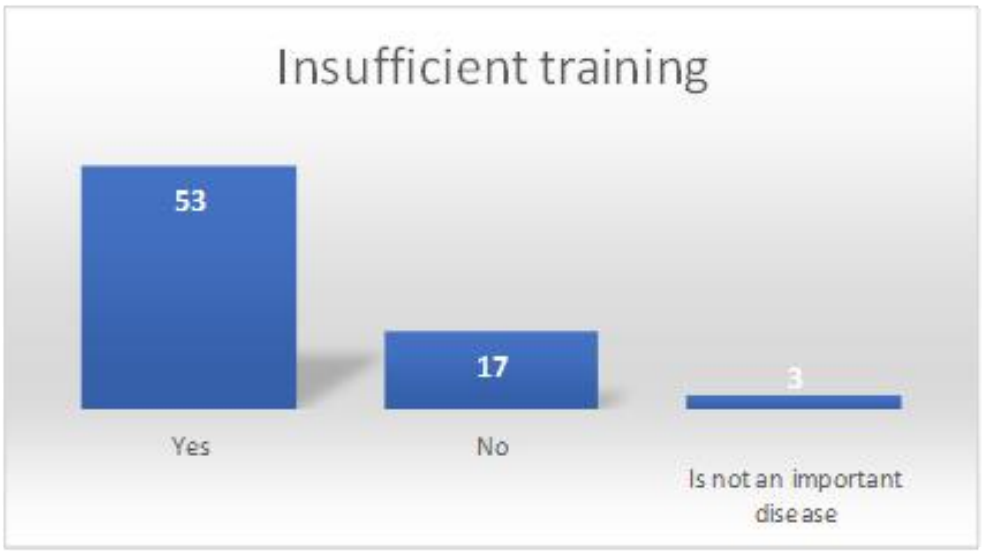

Figure 1. Insufficient training

Of the nurses in our study, 43 know the symptomatology and also the risk factors and 22 are not in knowledge of none.

Table 1. Contingency table between symptomatology and risk factors

	Cunosc factorii de risc	Nu cunosc factorii de risc
Cunosc simptomatologia	43	6
Nu cunosc simptomatologia	2	22

37 nurses declared that they can easily identify a patient with post-partum depression.

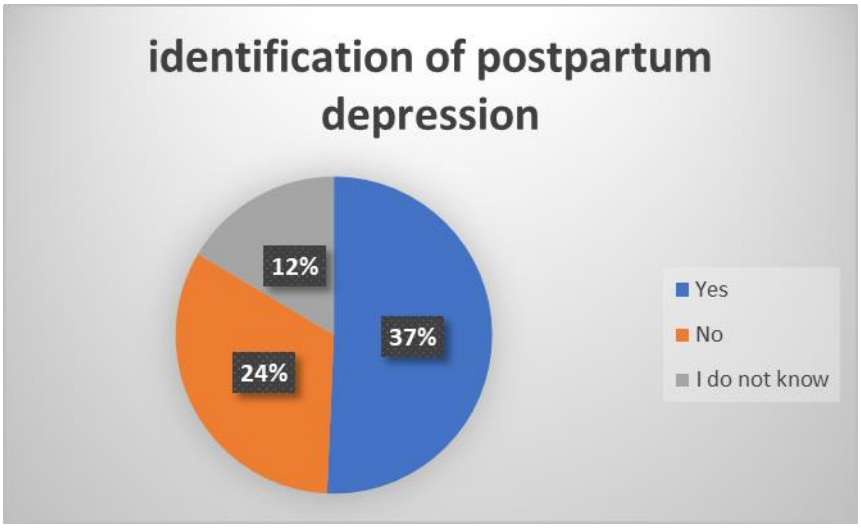

Figure 2. Identification of postpartum depression

The results also indicate that the nurse experience is very important.

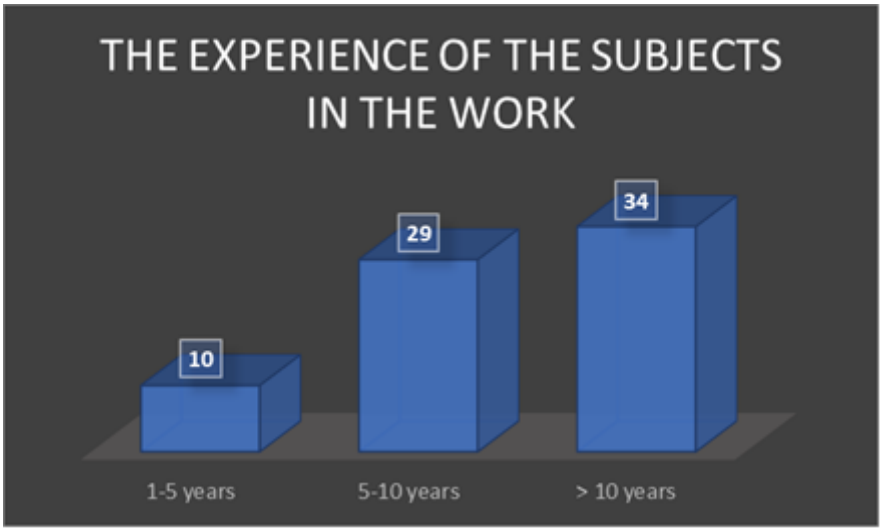

Figure 3. The experience of the subjects in the work

However there are many different methods of screening; the participants were asked what measures do they take when facing a patient with postpartum depression; 27 reply that they apply their own methods of counseling, 43 said that they announce a medic and other 3 do not consider, depression a severe illness.

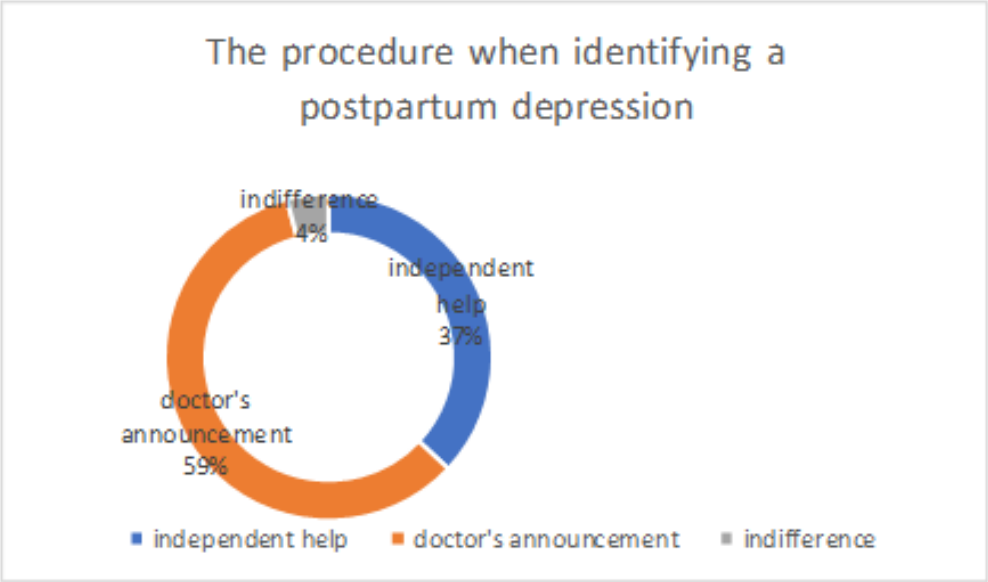

Figure 4. The procedure when identifying a postpartum depression

DISCUSSIONS

Some possible important directions for future studies would be:

- a more detailed study program of postpartum depression, both in post-secondary schools and in university studies, focusing on screening methods, symptoms, risk factors and the consequences of this condition
- conducting prenatal classes for both parents
- nationwide screening of postpartum depression, performed by average medical staff, through home visits immediately after birth, follow-up visits.
- campaigns to raise awareness of postpartum depression as a public health problem, through television commercials and making posters and flyers.
- family involvement of people at high risk for postpartum depression.

CONCLUSIONS

Postpartum depression is seen in approximately 10% of women who have recently given birth, but also in 3, 3% of men. Despite of this numbers, the Romanian medical personnel is not yet well prepared in facing this ilness. For a good management of postpartum depression, there has to be a collaboration between the medical staff and nurses.

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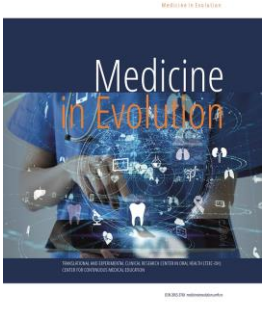
Carbapenemase-producing Enterobacteriaceae isolated in Arad Clinical Emergency Hospital in 2021



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Abstract

Knowing hospital circulation of antimicrobial - resistant bacteria is a must in present time, when "superbugs" are present in higher prevalence, in medical facilities and in community as well. In 2021, a pandemic year, hospitals were mainly dedicated to Covid 19 patients, with reduced activity for general population. Even so, data shows that Gram negative bacteria (GNB), multidrog resistant (MDR) and bacteria displaying carbapenemase-production are all higher at an alarming level. Our study demonstrate that MDR strains reached 52.67% for GNB and carbapemenase-producing Enterobacteriaceae were present in 24.24% for ESBLs, 10.05% for oxallicinases, 7.13% for KPC activity, 6.16% for OXA 48, 4.54% for MBLs and 1.70% for AmpC.

Keywords: Carbapenemase-producing Enterobacteriaceae, β-lactamases, AmpC, Metallo-β-lactamases (MBLs), Innovation, technology, research projects, etc

INTRODUCTION

The β-lactam family of antibiotic molecules consists of four groups: cephalosporins, monobactam, penicillins, and carbapenems [1].

Carbapenems are extremely effective in treating severe bacterial infections. This class of antibiotics is usually reserved for known or suspected multidrug-resistant (MDR) bacterial infections [2]. The spectrum of activity of the carbapenems imipenem, doripenem, and meropenem includes most Enterobacteriaceace species, including Escherichia coli, Klebsiella pneumoniae, Enterobacter cloacae, Citrobacter freundii, Proteus mirabilis, and Serratia marcescens; they are efficient against most strains of E. coli and K. pneumoniae resistant to cephalosporins due to the production of extended spectrum beta-lactamases. Imipenem, doripenem, and meropenem are active against most strains of Pseudomonas aeruginosa and Acinetobacter species [3].

Carbapenemase-producing Enterobacteriaceae CPE) are carbapenem-resistant Enterobacteriaceae (CRE) containing enzymes (e.g. OXA-48, KPC and so on) capable to break down the antibiotics and prevent them from killing the bacteria. Carbapenemases are carried on plasmids, and can easily transfer from one bacteria to another, resulting in an aggressive spread of these resistant pathogens. Pathogens harbouring these enzymes are sometimes called "superbugs", being generally resistant to most/all other antibiotics [4]. Various ESBLs (extended spectrum beta-lactamases) and carbapenemases have been reported in the Enterobacteriaceae including Enterobacter, Klebsiella, Escherichia coli [5], and other opportunistic species such as Serratia [6].

The Ambler Classification of β-lactamases, based on amino acid homology, is the most used method to classify β-lactamases, being considered the simplest classification scheme of β-lactamases [7] : Class A (TEM-1, 2, SHV-1ESBLs, KPC), Class B (MBLs, NDM, IMP, VIM), Class C (ampC, CMY), Class D (OXA).

Class A (KPC, ESBL), Klebsiella pneumoniae carbapenemase (KPC) - producing bacteria are a group of emerging highly drug-resistant Gram-negative bacteria. Although K. pneumoniae remains the most prevalent bacterial species carrying KPCs, the enzyme has been identified in several other Gram-negative bacilli. KPCs are an important mechanism of resistance for an increasingly wide range of Gram-negative bacteria and are no longer limited to K pneumoniae [8].

Class B (MBLs) Metallo-β-lactamases (MBLs) are transmissible carbapenemases of increasing prevalence in Gram-negative bacteria among health care facilities worldwide [9].

Class C (ampC), AmpC beta-lactamases are clinically important cephalosporinases encoded on the chromosomes of many of the Enterobacteriaceae and a few other organisms, where they mediate resistance to cephalothin, cefazolin, cefoxitin, most penicillins, and beta-lactamase inhibitor-beta-lactam combinations [10].

Class D (OXA) β-lactamases are characterized as penicillinases that can hydrolyze oxacillin and cloxacillin and are poorly inhibited by clavulanic acid and EDTA. OXA-48 is one of the few members of this family to possess notable carbapenem-hydrolyzing activity [11]. The OXA-48 enzyme is an Ambler class D beta-lactamase that hydrolyzes carbapenems but shows very weak activity against extended-spectrum cephalosporins such as cefepime and ceftazidime (third and fourth cephalosporine generation)

Objective. To assess prevalence of carbapenemase-producing enterobacteriaceae isolated in Arad Clinical Emergency Hospital in 2021.

MATERIAL AND METHODS

Retrospective prevalence study of enterobacteriaceae isolated in hospital´s microbiological laboratory, which were susceptibility to carbapemems (Antibacterial drug susceptibility was determined by the disk diffusion method and interpreted according to the European Committee on Antimicrobial Susceptibility Testing guidelines (www.eucast.org). Every isolate was analysed also using Ambler Classification system.

RESULTS

Of 2466 Gram negative bacteria, 1299 (52.67%) were MDR, mainly ESBLs (24.24%) and by carbapenemase oxacilinaze production (10.05), table 1. Percent of Carbapenemase-producing Enterobacteriaceae is displayed in table 2.

Table 1. Prevalence for MDR mechanisms in Gram negative bacteria in 2021

GNB carbapenemases	percent	Antimicrobial resistance
Class A-Beta-lactamase ESBL	24.24	Cefotaxime, ceftazidime, cefpodoxime aztreonam
Class D-OXA-23-like, OXA-24-like, OXA-48-like, OXA-58-like	10.05	Cephalosporins third and four generation, clavulanic acid, tazobactam and sulbactam, oxacillin and cloxacillin
Class A-Carbapenemase KPC activity	7.13	Aztreonam
Class D-Carbapenemase OXA 48	6.16	Cephalosporins third and four generation, clavulanic acid, tazobactam and sulbactam, oxacillin and cloxacillin
Class B -Carbapenemase MBLs	4.54	Aztreonam, ceftazidime, imipenem
Class C-Beta-lactamase AmpC	1.70	Aztreonam, cefoxitin

Legend: GNB=Gram negative bacteria, KPC= *Klebsiella pneumoniae* carbapenemase, OXA 48= carbapnemase OXA 48, MBLs= *Metallo-β-lactamases,* AmpC=cephalosporinases, OXA-23-like, OXA-24-like, OXA-48-like, OXA-58-like=carbapenemase oxacillinases

Enterobacteriaceae isolates (notably 224 *Klebsiella pneumoniae*, 19 *Escherichia coli*, 25 *Enterobacter cloacae*, 224 *Klebsiella pneumoniae,* 155 *Proteus penneri,*) were in total 2100 of which 34.76% (n= 730) displayed reduced susceptibility to carbapemems, table 2.

Table 2. Prevalence for carbapenems - resistant Enterobacteriaceae

Enterobacteriaceae	Frequency of resistant strains	total	Percent carbapenems-resistance
Citrobacter freundii	2	17	11.76
Enterobacter cloacae	25	87	28.74
Escherichia coli	19	875	2.17
Escherichia fergusonii	3	7	42.86
Klebsiella oxytoca	2	15	13.33
Klebsiella pneumoniae	224	418	53.59
Morganella morganii	7	46	15.22
Proteus mirabilis	2	5	40
Proteus penneri	155	256	60.55
Proteus rettgeri	14	17	82.35
Proteus vulgaris	6	16	37.5
Serratia liquefaciens	2	7	28.57
Serratia marcescens	5	31	16.13
Serratia odorífera	1	1	100
Total	730	2100	34.76

Table 3. Prevalence for MDR mechanisms in Carbapenemase-producing Enterobacteriaceae

Enterobacteriaceae	KPC activity	OXA 48	MBLs	oxacillinases	ESBLs	AmpC
Citrobacter freundii	0.00	0.00	0.00	0.00	5.88	0.00
Enterobacter aerogenes	0.00	0.00	0.00	0.00	13.33	0.00
Enterobacter cloacae	2.30	14.94	14.94	1.15	37.93	3.45
Escherichia coli	0.34	0.11	0.11	1.14	14.63	0.69
Klebsiella pneumoniae	22.73	20.33	20.33	1.67	58.13	1.67
Morganella morganii	4.35	2.17	2.17	0.00	34.78	4.35
Proteus penneri	7.42	16.41	16.41	0.78	53.52	7.03
Proteus rettgeri	5.88	17.65	17.65	5.88	70.59	0.00
Proteus vulgaris	0.00	18.75	18.75	0.00	18.75	0.00
Serratia marcescens	6.45	0.00	0.00	0.00	54.84	3.23

Legend: GNB=Gram negative bacteria, KPC= Klebsiella pneumoniae carbapenemase, OXA 48= carbapnemase OXA 48, MBLs= Metallo-β-lactamases, AmpC=cephalosporinases, OXA-23-like, OXA-24-like, OXA-48-like, OXA-58-like=carbapenemase oxacillinases

Circulation of MDR bacteria was frequent mainly in intensive care and palliative departments, (p=0.000) figure 1.

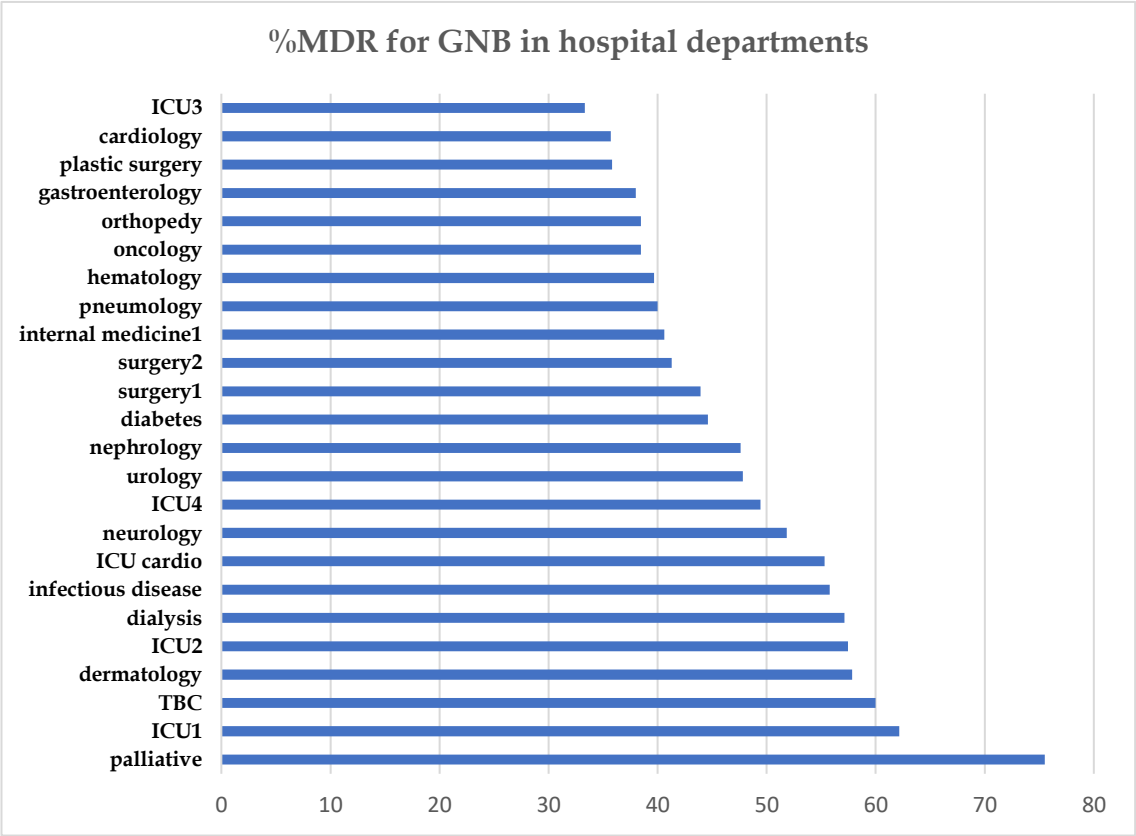

Figure 1. Department distribution for MDR GNB

Legend: ICU1= intensive care unit 1, ICU2= intensive care unit 2, ICU3= intensive care unit 3, ICU4= intensive care unit 4

DISCUSSIONS

Carbapenemase-producing Enterobacteriaceae were almost unknown up to the 1990s, today being encountered routinely in almost all hospitals and other healthcare facilities in many countries. KPC-producing *Klebsiella pneumoniae* was the first to emerge and spread

globally and is endemic in the United States, Israel, Greece, and Italy. Recently, NDM-producing Enterobacteriaceae and OXA-48-producing K. pneumoniae appear to be disseminating from South Asia and Northern Africa, respectively. They are almost always resistant to all β-lactams including carbapenems and many other classes. [12].

The results of this study, where most isolates were identified in the palliative center, overlap with the undesirable results of other countries, for instance The Centre for Health Protection of the Department of Hong Kong Health investigated in December 21 last year a cluster of Carbapenemase-producing Enterobacteriaceae at a residential care home for the elderly in Sham Shui Po, and reminded the public on maintaining strict personal and environmental hygiene, and proper use of antibiotics[13]. More, Ireland Health Protection Surveillance Centre has a complete document on Carbapenemase-producing Enterobacteriaceae in palliative care, intended for healthcare professionals working in palliative care [13].

CONCLUSIONS

The prevalence of the β- lactamases in the hospital isolates emphasizes the need for an insistent surveillance of resistant strains, guidelines for the antibiotic therapy and the implementation of infection control measures to reduce the increasing burden of antibiotic resistance. Mortality from invasive Carbapenemase-producing Enterobacteriaceae infections reaches up to 40%. To obtain the maximal benefit from the limited options available, dosing of antimicrobial agents should be optimized based on pharmacokinetic data, especially for colistin and carbapenems. In addition, multiple observational studies have associated combination antimicrobial therapy with lower mortality compared with monotherapy for these infections. The outcomes appear to be especially favorable when patients are treated with a carbapenem and a second agent such as colistin, tigecycline, and gentamicin, but the best approach is yet to be defined. [12].

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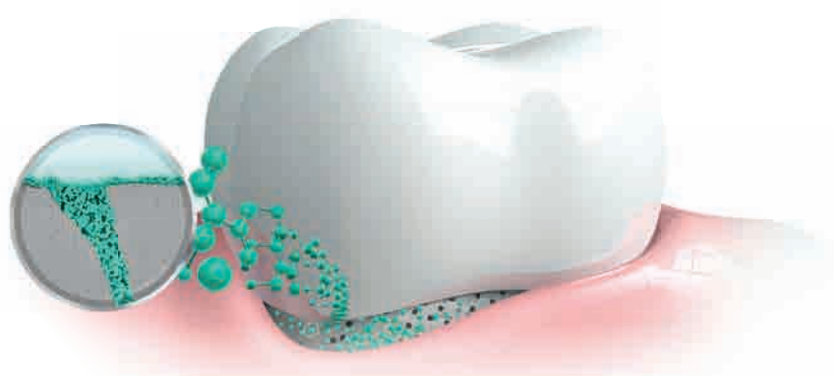
Noul elmex®SENSITIVE PROFESSIONAL cu tehnologia PRO-ARGIN

Calmarea **imediată* și de durată** a durerii din sensibilitatea dentară[1,2]



- În contact cu saliva, se formează un strat bogat în calciu, care obturează instant[1,*] tubulii dentinari deschiși
- Stratul rămâne intact în timp, chiar după expunerea la acizi, asigurând calmarea de durată a durerii din sensibilitatea dentară[2,3]

93% dintre pacienți confirmă calmarea durerii din sensibilitatea dentară[4]

93% dintre pacienți — confirmă reducerea hipersensibilității dentinare[4]

91% dintre pacienți — apreciază recomandarea medicului stomatolog[4]

Calmarea imediată* a durerii din sensibilitatea dentară[1]

Calmarea imediată* și de durată începe cu recomandarea dumneavoastră**

*Pentru calmare imediată, aplicați direct cu degetul pe dintele sensibil și masați ușor pentru 1 minut;
**Doar în legătură cu pasta de dinți

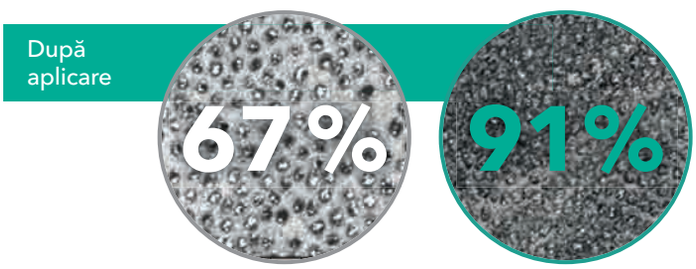
Referințe: 1. Nathoo S, et al. J Clin Dent. 2009;20(Spec Iss):123 –130; 2. Docimo R, et al. J Clin Dent. 2009;20(Spec Iss): 17– 22.; 3. Report Deon Hines-0003, 2016; 4. Studiu Ipsos cu privire la utilizarea produsului elmex® SENSITIVE PROFESSIONAL Repair & Prevent, efectuat în Polonia, rezultate după 2 săptămâni de utilizare, cu 325 de participanți (2017).

elmex® SENSITIVE PROFESSIONAL realizează obturarea superioară a tubulilor dentinari în comparație cu tehnologiile concurente[1,2,*]

Studiul 1[1,*]

Tehnologia cu fluorură de staniu/ fluorură de sodiu

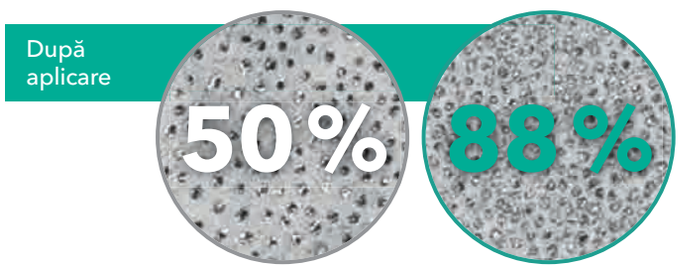
Tehnologia PRO-ARGIN



Studiul 2[2,*]

Tehnologia Novamin/ fluorură de sodiu

Tehnologia PRO-ARGIN



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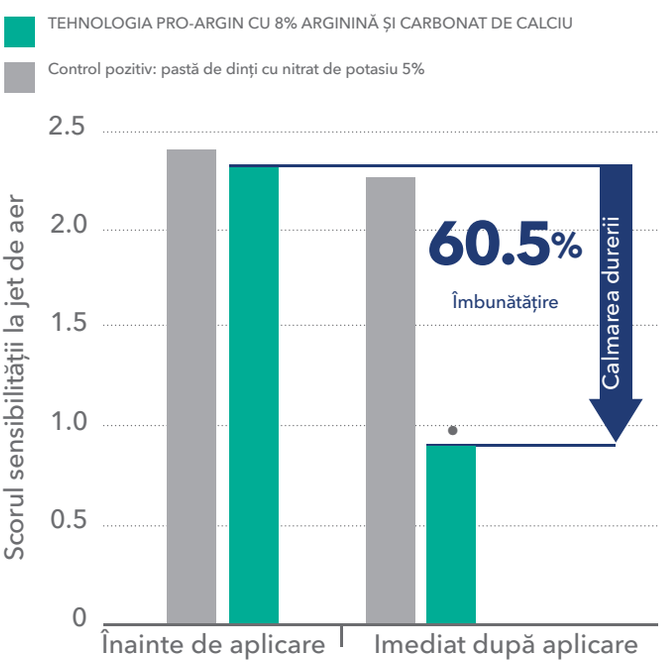
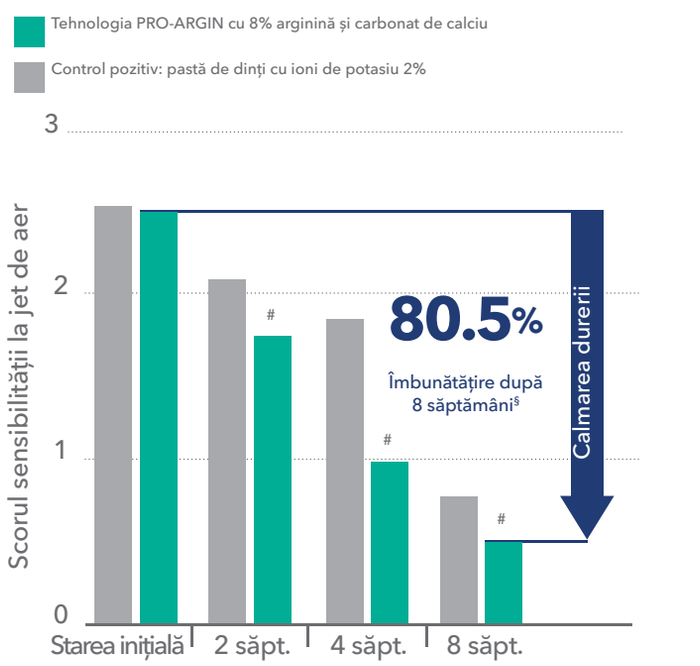
Calmarea semnificativă a durerii din sensibilitatea dentară instant[3,‡,**]



‡ În comparație cu starea inițială (sunt prezentate doar datele relevante)
• Semnificativ statistic (p<0,001)

Calmarea semnificativă de lungă durată a durerii din sensibilitatea dentară după 2, 4, și 8 săptămâni de utilizare[4,§,&]



§ În comparație cu starea inițială
& În comparație cu o pastă de dinți comercială desensibilizantă, ce conține 2% ioni de potasiu și 1450 ppm de fluor (NaF)
# Semnificativ statistic (p<0,05)

*Studiu in vitro, imagini reale de microscopie confocală după 5 aplicări (p<0,05%);
**Pentru calmarea imediată aplicați direct pe suprafața sensibilă și masați ușor cu vârful degetului timp de 1 minut.

Referințe: 1. Hines D, et al. Poster acceptat, July 2018 IADR. Colgate- Palmolive Company 2018.; 2. Hines D, et al. Poster #0742, March 2018 AADR. Colgate-Palmolive Company 2018.; 3. Nathoo S, et al. J Clin Dent. 2009;20(Spec Iss):123 –130; 4. Docimo R, et al. J Clin Dent. 2009; 20(Spec Iss): 17– 22.

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Clinical study on the frequency of dental examinations and oral prophylaxis in patients diagnosed with type 2 diabetes mellitus and periodontal disease

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Abstract

Data on diabetic patients' attitudes and behaviour toward oral hygiene procedures is limited. The purpose of this study is to compare the habits of diabetic and non-diabetic periodontitis patients in terms of dental health and prophylaxis, in order to promote public oral health education. A total of 94 patients from Bihor County participated in the study. Dental check-ups and oral prophylaxis are two aspects neglected by both diabetic patients with periodontal disease and non-diabetic patients with periodontitis. The findings of this clinical study could be used to develop public health policies aimed at screening and primary prevention of periodontal disease in diabetic patients, as well as raising awareness of the importance of dental examinations and the prevention and management of oral complications among patients suffering from diabetes.

Keywords: Prophilaxys, diabetes mellitus, periodontal disease

INTRODUCTION

The oral cavity's health is now just as vital as one's overall health. However, there is a paucity of data on attitudes and behavior about oral hygiene measures in relation to overall health among dental patients [1]. The value people place on dental care practices and professional hygiene of the oral cavity is influenced by medical education, family skills and oral health behavior [2].

Improper oral hygiene practices encourage the development of different oral diseases [3]. Oral hygiene misconceptions can lead to dangerous practices, particularly in patients with chronic systemic diseases [4]. Diabetic patients are plagued by a slew of problems. Oral pathologies have a significant impact on diabetic patients standard of living [5].

However, knowledge of oral hygiene is often inadequate among diabetic patients. Hyperglycemia and dental disorders are on the rise in many populations, resulting in a decline in oral and general health-related quality of life [6, 7].

Aim and objectives

The goal of this study is to assess diabetes versus non-diabetic periodontitis patients' attitudes and habits towards oral health and prophylaxis in order to improve public oral health education.

MATERIAL AND METHODS

We conducted a case-control study. The clinical trial took place in Oradea, Bihor County. The study was launched after it was evaluated and approved by the Research Ethics Commission within the University of Oradea, Faculty of Medicine and Pharmacy, receiving the favorable opinion no. 3 from 29.06.2020.

The patients were randomly chosen from the general population who came to the dentist's office during the research. The project occured at CMI Dr. Potra Cicalău Georgiana Ioana, a private dental clinic in Oradea, for which I have the permission of the institution. Each patient was told of the research's goal, the methods of investigation used and the prospective advantages prior to being included in the research. In order to participate in the study, each patient gave his written consent.

Population group was split in two: study group - those who had been exposed to the risk factor - diabetes and control group - those who had not been exposed to the risk factor. Our investigation comprised a total of 94 patients. Study group consists of 41 patients with type 2 diabetes and periodontal disease and control group of 53 patients with periodontal disease but no diabetes.

Questionnaires were used to record the information gathered. The patient evaluation form was designed specifically for our investigation, based on national and international medical questionnaires and observation sheets [8, 9, 10].

The clinical research has several limitations because of the small sample size, which can be explained by the high rejection rate, caused by patients' disagreement with the filling out the "Informed Consent" or other documents in which personal data have been processed. The SPSS24 program was used for statistical analysis. The significance level of *p*-Value 0.05 has been chosen.

RESULTS

The demographic data collected from the patients includes gender, age, geographic location and educational level. The gender distribution of patients in the two groups of analysis does not differ statistically significant (*p*-Value=0.203). The population is divided into 50% male and 50% female patients.

Table 1 shows how patients were classified into six groups based on their ages. Group IV had more than half of the patients. The average age of the patients in the research group is 61±9.7 years, whereas the average age of the control group is 43±15 years. The average age of the population is 51±16 years. From a statistical standpoint, the distribution of patients by age group in the two groups of patients differs significantly (*p*-Value=0).

Table 1. Population distribution by age

Group	Age (years)
I	22-30
II	31-40
III	41-50
IV	51-60
V	61-70
VI	71-80

There are no significant changes in patient distribution based on their origin environment (*p*-Value=1). Patients in the study group came from 65.8% of urban areas and 34.2%of rural areas, while patients in the control group came from 67.9% of urban areas and 32.01% of rural areas.

There are substantial disparities in educational levels between the two groups of patients (*p*-Value=0). The majority of patients in the study group have completed vocational school, while the majority of patients in the control group have completed higher education. Figure 1-4 depicts the features of the population group.

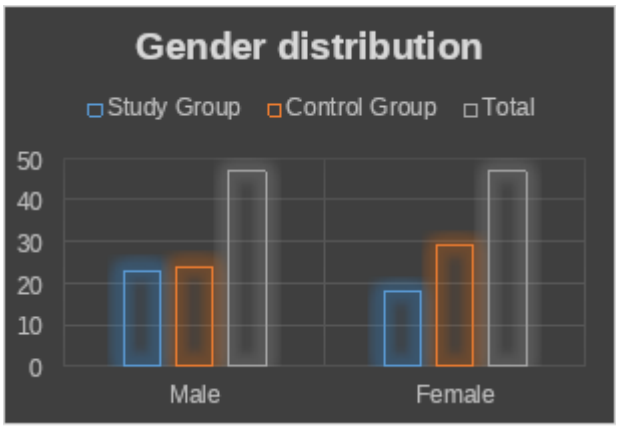

Figure 1. Gender distribution

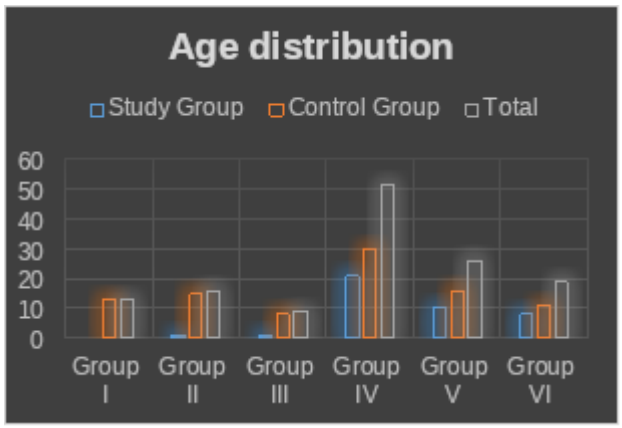

Figure 2. Age distribution

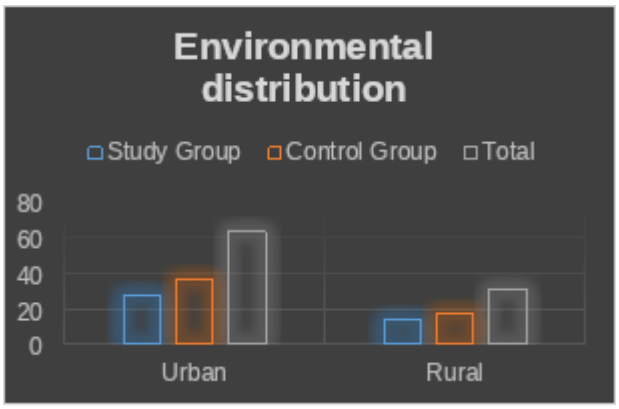

Figure 3. Environmental distribution

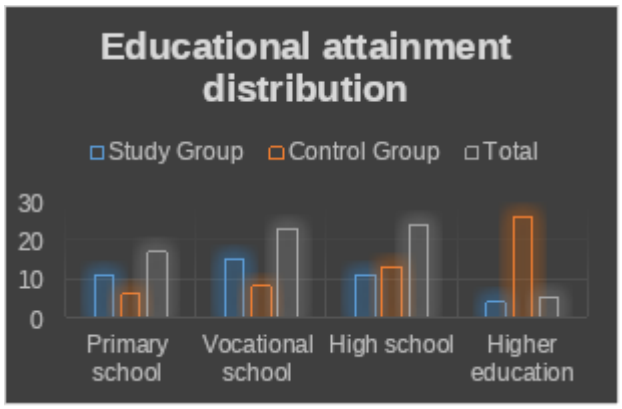

Figure 4. Educational attainment distribution

In the distribution of patients according to the frequency of dental examinations and the frequency of oral prophylaxis, there are significant differences (*p*-Value=0.006).

In the study group, 29.3% of patients reported dental examinations once a year and 70.7% never in the last year. No patient in the study group was consulted by the dentist twice a year. The frequency of dental follow-ups in the control group is 37.7% once a year, 17% twice a year and 45.3% never in the last year.

Oral prophylaxis among patients in the study group had a frequency of 9.8% once a year and 90.2% never in the last year. In the control group, the majority (62.3%) of the patients did not benefit from oral prophylaxis services in the last year. Only 9.4% of the patients in the control group requested oral prophylaxis twice a year, while in the control group the professional hygiene of the oral cavity was not requested by any patient. Figure 5-6 ilustrates the frequency of dental examinations and oral prophylaxis of the participants enrolled in our study.

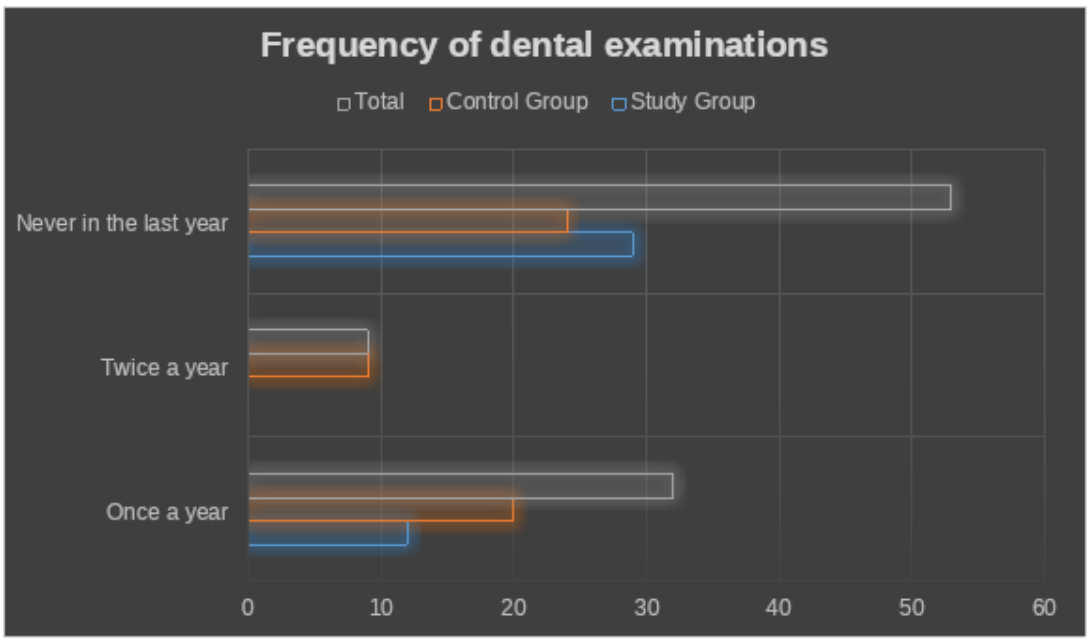

Figure 5. Frequency of dental examinations

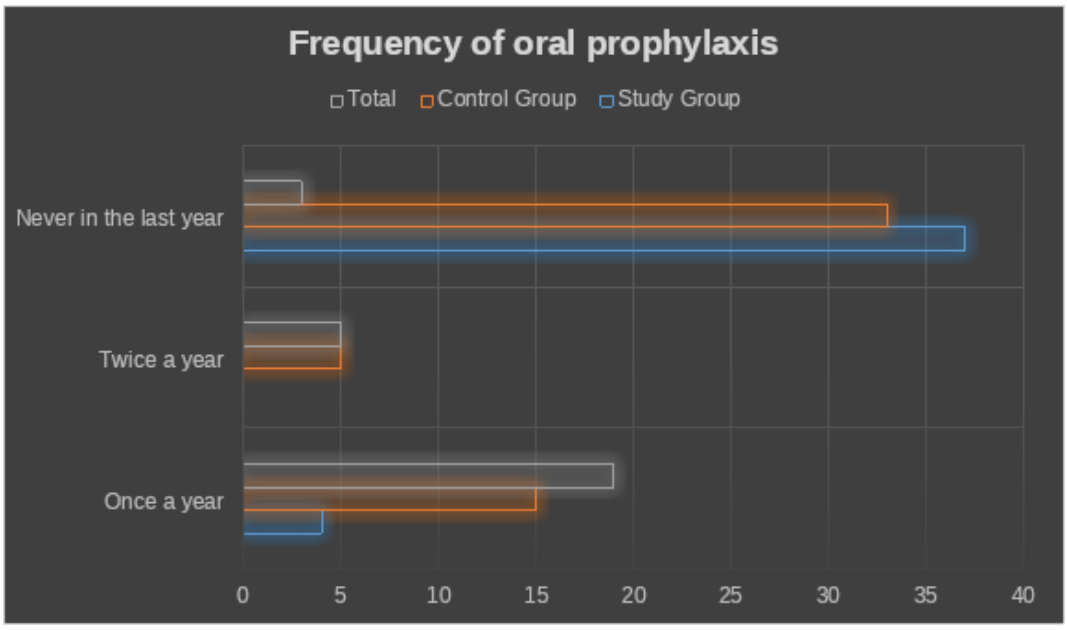

Figure 6. Frequency of oral prophylaxis

DISCUSSIONS

According to statistical analysis of the demographic characteristics of the patients, the study group has predominantly male patients, whereas the control group contains mostly female patients. Older men have a higher prevalence of type 2 diabetes than women, due to the fact that men have greater visceral fat than women [11]. Males are being diagnosed with diabetes at an increasing rate, on the report of IDF. In 2013, there were 14 million times more diabetic men than women [12]. Regarding periodontal disease, Jain et al. said that the combined effect of gender-specific genetic architecture and circulating levels of sex steroid hormones may explain the variation in the risk of chronic periodontitis, but in their study men were more susceptible than women [13]. Men have a higher prevalence of periodontal disease, as stated by other studies [14]. Ioannidou et al. investigated the role of gender in chronic periodontitis and found that it is more common in males than in women, implying that gender plays a role in periodontal disease development. This can be explained by the fact that most traditional periodontal disease investigations have been undertaken as one-of-a-kind studies that have only focused on men [15]. As a result, Kautzky-Willer et al. believe that modern tailored treatment must account for biological variations between men and women, such as genetic predisposition and sex hormones, as well as behavioral and environmental differences [16].

Patients in both groups were mostly in their 50s and 60s. On the authority of IDF, type 2 diabetes affects almost 400 million people globally between the ages of 20 and 70. This value is predicted to increase to 592 million by 2035 [17]. Furthermore, diabetes claimed the lives of nearly 4.2 million persons aged 20 to 99 in 2019 [18]. In the opinion of Han et al. aging increases the risk of periodontal disease in diabetic patients [19]. The begining of type 2 diabetes was once thought to occur between the ages of 40 and 50, but cases are now being found in younger age groups, as indicated by our study [20, 21]. Reynolds et. al considered that chronic inflammation is a key component of prevalent age-related disorders such as periodontal disease and diabetes [22]. Kassebaum et al. showed a dramatic increase in the prevalence of severe periodontitis, between the third and fourth decades of life [23].

In terms of the origin environment, we discovered that the urban environment predominated in both groups. Other researchers achieved the same results [24, 25]. On the

other hand, children in rural settings are more likely to develop periodontal disease than children in urban areas, as claimed by Rao et al. [26]. At the same time, Agarwal et al. said that periodontal disease is more common in rural areas due to a lack of a structured dental care system [27]. The study's prevalence of the urban environment can be explained by the fact that the research was conducted in an urban dentistry office.

The majority of patients with type 2 diabetes and periodontal disease have professional training, whereas those in the control group are college graduates, according to our data. Low educational attainment is linked to poor health. It has been documented in some studies that low educational status is associated with a negative effect on glycemic control [28]. Patients with a high school diploma had a higher risk of diabetes than those with at least a bachelor's degree [29]. Roy et al. and Al-Rasheedi et. al found that there is a strong association between lifestyle and education with periodontal health [30, 31].

Diabetic patients ignore dental check-ups more than non-diabetic patients in the control group, as evidenced by the low frequency of visits to the dentist in the previous year. These findings are in line with research reported in the Journal of the American Dental Association, which indicated a general drop in dental visits among people with and without diabetes. Adults with diabetes are less likely than those with prediabetes or no diabetes to go to the dentist [32], despite the American Dental Associations' recommendations for at least once-a-year visits to the dentist for routine examinations and professional hygiene [33]. In another study, Simon et al. found that the average interval between visits to the dentist for diabetes patients was over a year [34]. Commercials advise visiting the dentist twice a year or more frequently [35].

Even worse, 90% of diabetics have never obtained oral prophylaxis services in the previous year, indicating that oral prophylaxis is unknown among them. According to Yuen et al., dental hygienists do not commonly educate patients on oral health and diabetes-related healthy lifestyles [36]. According to Oyapero et al., dental prophylaxis and oral care education can improve the wellbeing of individuals with diabetes [37]. Similarly, Willershausen et al. believe that professional dental hygiene should be performed every 3 to 6 months to reduce the incidence of periodontal disease [38].

Periodontal disease and diabetes mellitus are two diseases with a global distribution and a common trait of chronic inflammation [39]. Oral disease and periodontitis can be prevented by proper mouth cleaning, regular teeth brushing and dental flossing [40]. Periodontal disease management may help with glycemic control [41].

CONCLUSIONS

1. Male patients (56%) have an increased prevalence of diabetes and periodontal disease, while female patients have a greater prevalence of periodontal disease (56%).
2. Patients with diabetes and periodontal disease are on average 61.19 years old, while those without diabetes are 43.45 years old.
3. Patients with diabetes and periodontitis account for 65.8% of the total, whereas patients with periodontal disease account for 67.9% of the total.
4. Diabetics with periodontitis have as educational level, vocational school in 36.6% of cases, while patients with periodontal disease without diabetes, have a higher level of education (49.05%).
5. In the previous year, 70.7% of patients with diabetes and periodontal disease and 45.3% of patients with periodontitis did not visit the dentist.
6. Of the patients with type 2 diabetes and periodontal disease, 90.2% had not received oral prophylaxis in the previous year, nor 62.3% of patients with periodontal disease.

The findings of this clinical study could be used to develop public health policies aimed at screening and primary prevention of periodontal disease in diabetic patients, as well as raising awareness of the importance of dental check-ups and the prevention and management of oral complications among diabetics.

Acknowledgments

This paper is a result of the research conducted in elaborating the thesis of PhD student, Dr. Georgiana Ioana Potra Cicalău, under the supervision of Prof. Univ. Dr. Maria Claudia Jurca.

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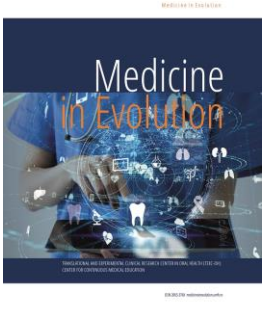
Identifying incipient caries process



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Abstract

Due to the high frequency of caries lesions within the population and due to the lack of a clear caries diagnosis protocol, new powerful methods of clinical investigation were developed. The purpose of this study was to underline the importance of detecting the incipient caries process with the help of a VistaCam iX intraoral camera, as the majority of initial processes remain undetected clinically and radiologically. VistaCam iX, designed by DÜRR DENTAL used the intraoral camera as therapeutic support for future dental treatments. The interchangeable heads mechanism (cam, proof, macro, poly, proxi) allows the camera to be used in several ways.

Keywords: caries process, VistaCam iX, intraoral camera

INTRODUCTION

Due to the high frequency of caries lesions within the population and due to the lack of a clear caries diagnosis protocol, it is necessary to know the numerous devices used to detect an incipient caries lesion. New powerful methods of clinical investigation were developed to allow the identification of the cavities process from its initial stage.

Aim and objectives

The purpose of this study was to underline the importance of detecting an incipient caries process with the help of a VistaCam iX intraoral camera, as the majority of initial processes remain undetected clinically and radiologically. Oftentimes, marmorations and pigmentations of the grooves and fossas are mistaken with a caries process or, in the case of deep grooves, the caries cannot be detected timely.

MATERIAL AND METHODS

For this study we have registered a number of 23 patients aged between 19 and 34, who came to the Preventive Dental Medicine Discipline. Each patient was examined carefully, obturations and incipient caries were identified by inspection and probing. Then, in order to make a correct diagnosis, to identify all incipient caries, each patient was scanned using all the VistaCam iX modules.

VistaCam iX is designed by DÜRR DENTAL. It uses an intraoral camera that provides therapeutic support for future dental treatments, due to the intraoral images, it helps patients to understand more easily the importance and necessity of the treatment, and last but not least, providing images before and after treatment.

The interchangeable heads mechanism (cam, proof, macro, poly, proxi) allows the camera to be used in several ways. In DBSWIN, the caries and dental plaque filters show the activity of caries using a grey scale with numeric assessment from 0 to 3. This system allows the early detection of any incipient caries, and also calculates their depth.

The role of the intraoral camera is to provide images inside the oral cavity and information on the patient's odonto-parodontal status, offering patients a better understanding of the health conditions of their teeth and parodontiun. The patients observe easily the structural changes of the enamel, which changes its color, texture or the occurrence of overflowing obturations (Fig. 1.). This way, the patients becomes aware of the lesions they have and also become cooperative.

Figure 1. (a - i). Incipient caries process detected using an intraoral camera

The macro camera helps to zoom in the image by up to 120 times. It can be used to detected incipient caries at the level of grooves and fosses, undetectable with the naked eye,

inter-dental caries and marginal closures incorrectly adapted or affected by secondary caries (Fig. 2.).

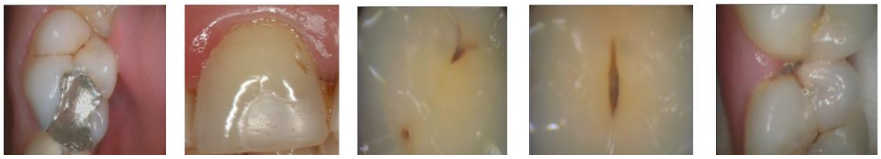

Figure 2 (a-e). Macro aspect of caries lesions

The poly camera helps to photopolymerise dental materials, being equipped with LED technology and soft-start function. The action time is 20 seconds after activation, and every 5 seconds the light is intensified. This camera functions similarly to a photopolymerization lamp.

The proof camera helps to detect the caries process bacterial plaque, graded using a color scale. Healthy enamel is green, and the violet LED stimulates bacteria to color red, and measures the depth of the caries process (Fig. 3). As the proof camera also identifies bacterial plaque, it is advisable to have the teeth to be investigated cleaned professionally before scanning.

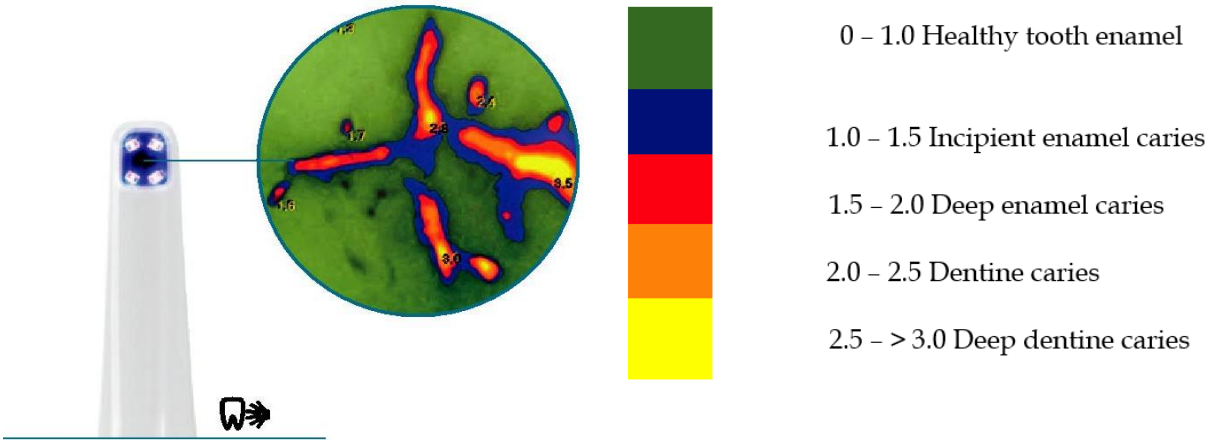

Figure 3. Proof camera color scale

The following figures show incipient caries processes detected using the VistaCam iX Proof, also indicating the depth of the caries process.

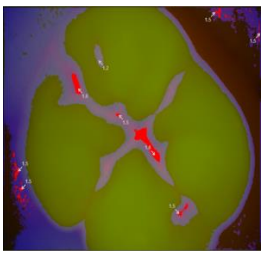

Figure 4. deep cavies process between 1.2-1.6 mm at 3.7

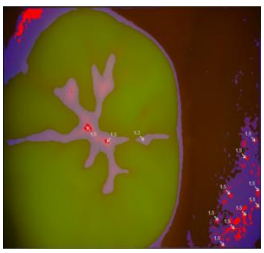

Figure 5. deep cavies process between 1.3-1.5 mm and 4.7

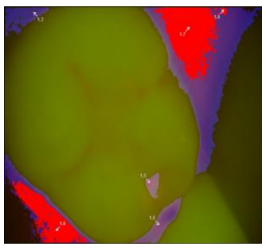

Figure 6. 1.5 mm deep cavies process at 1.7

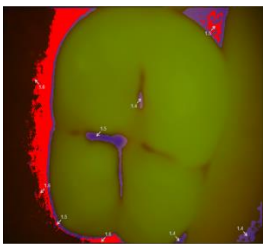

Figure 7. deep cavies process between 1.4-1.5 mm at 4.7

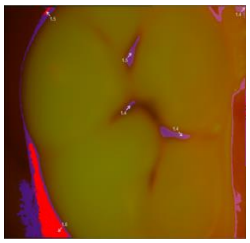

Figure 8. deep cavies process between 1.4-1.5 mm at 4.8

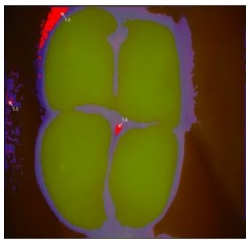

Figure 9. 1.6 mm deep cavies process at 3.7

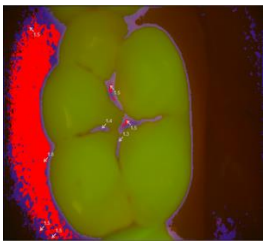

Figure 10. 1.3-1.6 mm deep cavies process at 4.6

The proxi camera uses laser technology to detect inter-dental caries process, making healthy enamel translucent, and the caries process appear slightly opaque.

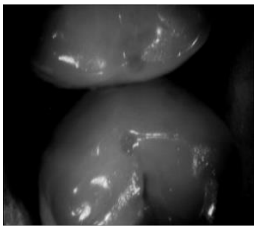

Figure 11. here are two opaque distal and medial areas indicating a caries process at 3.4 – 3.5

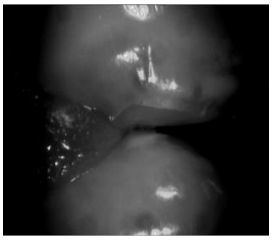

Figure 12. here is an opaque area around obturation at 1.2. and an opaque medial area indicating an incipient caries process at 1.3

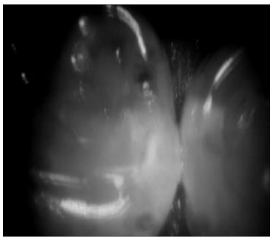

Figure 13. here are opaque distal and medial areas indicating a caries process at 1.4.-1.5

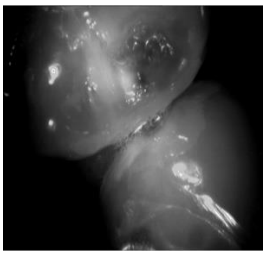

Figure 14. here is an opaque area indicating a caries process at 3.4. and an opaque occlusive area indicating a caries process at 3.5

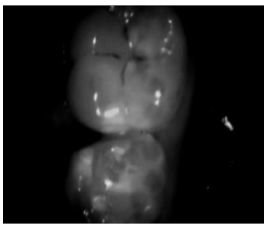

Figure 15. 4.5 here is an opaque area along the lingual cuspid indicating a caries process at 4.5. an opaque medial area indicating a caries process at 4.6

RESULTS

Clinicians have at their disposal a series of methods in order to make a correct diagnosis of caries lesion, however they generally use visual inspection and probing, results which are supplemented with radiography analysis. These methods have most often proven to be insufficient due to the existence of hidden caries. That is why it is better to use additional methods of investigation in order to be able to observe the caries process as early as possible.

Epidemiological studies have revealed the importance of the biological age in caries lesions pattern. With primary teeth, the lesions appear predominantly on the occlusive surface of the first permanent molars up to the age of 12, thereupon on proximal surfaces.

Following the clinical examination of the 23 patients, a number of 52 caries were detected by visual inspection and probing. After the scan with VistaCam iX, another 58 incipient caries were detected, both on the occlusive surfaces of grooves and fossas, as well as inter-dental. This significant number demonstrates the importance of adequate and incipient diagnosis of caries lesions and is a real challenge for any dentist.

As complementary diagnosis methods, dentists have at their disposal several alternatives, which can be selected according to possibilities:

- Laser-induced Fluorescence – LF
- Quantitative Light-induced Fluorescence – QLF
- Fibre Optic Transillumination – FOTI and DiFOTI
- Optical Coherence Tomography – OCT
- Polarization Sensitive Optical Coherence Tomography – PS-OCT
- Polarized Raman Spectroscopy – PRS
- Transillumination with Near-Infrared light – TI-NIR
- Infrared fluorescence - IR fluorescence
- Near-Infrared reflectance imaging – NIR reflectance imaging
- Terahertz Pulse Imaging Multiphoton imaging – TPI
- Time-Correlated Single-Photon Counting Fluorescence Lifetime Imaging – TCSPC FLIM

CONCLUSIONS

The classical examination using visual inspection and probing (supplemented by classical radiologic examination) has most often time proven insufficient in the case of hidden incipient caries. An efficient diagnosis system for caries lesions should detect both incipient and extended caries lesions. A correct examination should provide objective information on the existence and severity of the lesion. Any method should be used only on surfaces cleaned in advance to avoid false positive measurements.

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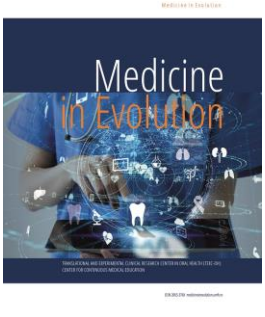
Digital vs. Conventional Wax-Up



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Abstract

Case presentation: This article aims at presenting a case of an esthetic previsualization using both digital and conventional wax-up technique in order to compare their results in terms of functional and esthetic outcome, workflow, time and costs.

Material and methods: For the digital method, the Smile Cloud application was used for Digital Smile Design, afterwards the project was imported into 3Shape Dental Designer software for designing the digital wax-up and a printed model was produced for the clinical mock-up. For the conventional method, alginate impressions and a facial bow registration were taken and the models mounted in a semi adjustable articulator were used to transfer the data provided by the dentist in order to design the analog wax-up.

Discussion/Conclusion: The digital wax-up has the advantages of a better macro and micro texture on the future restorations, it is less time consuming in terms of design and additional changes, but also being a more expensive option due to extensive equipment needed.

Keywords: digital wax-up, conventional wax-up, digital smile design

INTRODUCTION

In a world where smiles are advertised everywhere as a symbol of beauty, dynamism and youth, the prosthodontist has the mission of improving constantly the knowledge and techniques, therefore improving patients' lives. In order to obtain a predictable outcome, both esthetically and functionally, dentists may use the wax-up technique, which is nowadays seen as the first mandatory step in treatment planning. As Michelangelo used models as a source of inspiration for his works of art, the prosthodontist can use the wax-up technique in order to pre-visualize the final smile and facial aesthetics.

The wax-up can be made conventionally adding wax to a model poured from classic impressions, or in a digital way, by using the digital intraoral scan of the patient; additionally, intra and extra oral standardized photographs are imported into a digital smile design dedicated software. The software implies a library of natural dental morphologies, hence offering personalized aesthetics for each case by taking into consideration the patients' unique characteristics. Using the artificial intelligence and the digital articulators, the dedicated software uses functional parameters (such as sagittal condylar inclination and Bennett angle) while creating the digital project. Following the digital steps, the time for the previsualization of the case shortens, thus motivating the patients (1).

Aim and objectives

The aim of the present study is to compare the analog wax-up technique made by conventional additive technique with the digital wax-up technique, by taking into consideration the esthetic results, the amount of time needed to perform them, the financial costs, the occlusion and, lastly, the possibility of making further modifications of the project. These techniques were compared for the same subject, who benefited from the wax-up technique both made digitally and conventionally, with the future purpose of the maxillary teeth rehabilitation.

CASE PRESENTATION

The case included in this study is a female patient, aged 32 years old, whose main complaint was the aspect of the smile after completing a long orthodontic treatment. At the clinical evaluation the following issues were noticed: diastema, a slight deviation of the interincisal upper midline on the left side, a slight asymmetry of the lip, the asymmetry of the occlusal plane, absence of the micro and macro texture, gum exposure in the premolars and incorrect tooth proportions and tooth-to-tooth proportions. The patient expressed also the desire for a brighter color (Fig.1)

Conventional wax-up

For the conventional wax-up, the first step was the impressions taken with alginate (Cavex Cream Alginate, *Cavex*) and a facial bow registration (Artex Facebow, *Amann Girrbach)*. All the data were sent to the dental technician, alongside with the patient's chart, where all the future modifications decided by the doctor and the patient were written. For the functional parameters an electronic axiography was performed (Cadiax Compact 2, *Gamma Dental*) (Fig. 2).

The gypsum type IV stone casts were made (Garreco Dental) and the stone casts were mounted in the semi adjustable articulator (Artex, *Amann Girrbach)* and the articulator was programmed (Fig.3). Afterwards the dental technician added the wax to the models selectively taking into consideration the preferences communicated by the doctor and the patient (Fig. 4). After a meticulous check of the wax-up, the technician made a mock-up key,

using addition silicone putty (Fegura Sil Putty, *FEGURAMED*) (Fig. 5). The key was used and the prosthodontist made the conventional mock-up using a bright resin (Protemp 4 Bleach, *3M*) (Fig. 6).

Figure 1. Clinical examination and the decision for the treatment plan

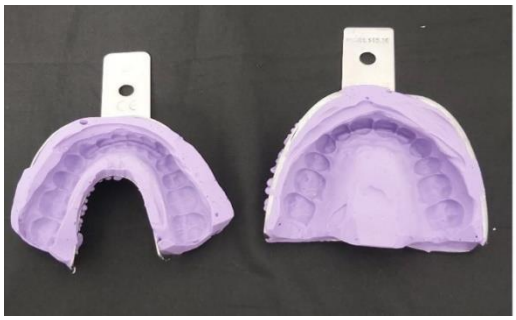

Figure 2. Impressions of the prosthetic field

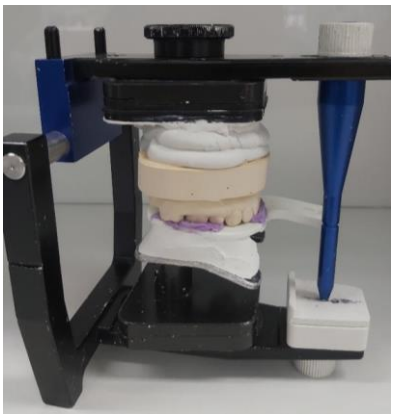

Figure 3. Mounting articulator

Figure 4. Addition of the wax on the models

Figure 5. Mock-up key for the conventional technique

Figure 6. Conventional mock-up

Digital wax-up

For the digital wax-up, a set of intra and extra oral standardized photographs using a DSLR Nikon D3500 was taken. The digital impression was taken with the intraoral scanner (Trios 3, 3Shape) (Fig.7). The collected data was introduced in Smile Cloud application and the digital smile design was performed. The workflow implied the following steps: the facial

references were set, the lip contour and the restorative space were determined (Fig. 8,9), and the most suited dental morphology according to the patient's characteristics was chosen by the algorithms from the teeth library (Fig.10). The project was afterwards made available to all team members and to the patient for a better collaboration. After overlapping the digital wax-up on the patient's photography, the project was presented to the patient and the desired modifications were noted, increasing its confidence in the future treatment. Any modifications considered necessary by the patient were performed instantly by the digital team. The CAD design of the project was, therefore, verified and approved by the patient.

The project was imported in the 3Shape Dental System, where the dental technician adjusted the teeth library chosen by the patient without modifying the shape of the restorations. The final project, the digital wax-up, was printed using a 3D printer (Asiga MAX UV, *Asiga*) (Fig.11). The silicone keys were made on the printed model, using addition putty and light body silicone (Virtual, *Ivoclar Vivadent*). The dentist performed the digital mock-up using the a bright resin (Protemp 4 Bleach, *3M*) (Fig.12) and the result was analyzed by the dentist-technician-patient team after taking a new set of photos (Fig.13).

Figure 7. Digital impression

Figure 8. Tracing the lip contour

Figure 9. Tracing the restorative space

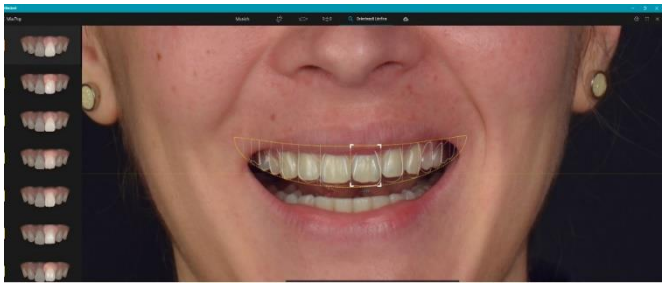

Figure 10. The biometric library

Figure 11. Printed model of the digital wax-up

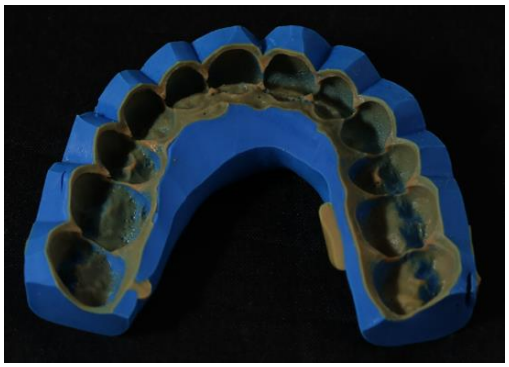

Figure 12. The silicone keys for the digital mock-up

Figure 13. Digital Mock-up

DISCUSSIONS

Using two different techniques, a comparison was made taking into consideration the time spent for each step, the final esthetic result, the ability to make instant changes regarding the patient's desires, the occlusal result and lastly, the cost of the workmanship and the equipments needed. The longer time documenting the case needed in the digital technique is compensated by the shorter time needed to make the project and to print the model, all these steps requesting less time than the conventional technique. These advantages of a digital workflow were also mentioned by Revilla-León et al. (2).

The possibility of creating simultaneous digital projects in order to offer a range of different restorations from which the patient can choose is another advantage of the digital wax-up as is mentioned also by Tallarico et al. (3). The ease of communication between the dentist and the patient and the ease of making changes to the project regarding the patient's desires has the result of shortening the time required for the wax-up while increasing the predictability of the final result. Similar aspects of the digital wax-up technique were also presented by Cervino et al. (4).

A better axial contour of the restoration using a conventional wax-up were obtained, but the natural teeth library involving micro and macro textures presented better esthetics meanwhile showing a higher rate of symmetry with the digital technique. These results are similar to studies conducted by Jafaar et al. (5).

The technological workflow of the digital wax-up involved equipments with a higher cost, such as the intraoral scanner, the 3D printer, the CAD software and the Digital Smile Design software. By comparison, the conventional wax-up technique requires less expensive equipments, therefore requiring a smaller cost, these advantages and disadvantages being similar to those presented by Garcia et al. (6).

CONCLUSIONS

The benefits of creating the wax-up digitally, such as having a greater predictability of the restoration, the ease of making instant changes in the project and the reduced amount of time needed for the completion of the project should be balanced with the higher price of the equipments needed for this technique. Meanwhile, the time spent by a dental technician to make a conventional wax-up and to perform changes to the project is considerably higher than the time needed to create a digital one.

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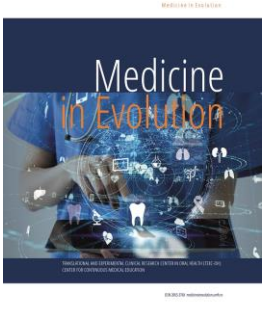
Dentists' involvement in oral health promotion and prevention in their daily practice



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Abstract

Oral diseases like caries and periodontal disease are highly preventable and the involvement of dental practitioners in preventive and educational measures in their daily practice play an important role. Aim: assessment of Romanian dental practitioners' interest and involvement in oral health promotion and dental prevention in their daily practice. Material and method: a cross-sectional pilot study was conducted in 2021 on a sample of 66 dentists, with a mean age of 37.59 ± 9.66 years, using an on-line self-assessment questionnaire. Results: 62.12% of dentists declared they include oral health promotion and prevention to a very large extent in their daily practice, 93.94% assessing and counselling their patients at the first appointment regarding risk factors. However, only oral hygiene is monitored during the dental treatment and less during the maintenance phase, while eating habits and smoking are seldom approached by the dentists. Professional dental cleaning based on regular notification of the patients is performed by 89.39% of dentists. Conclusion: Most of the dentists declare a high interest in integrating oral health promotion and prevention in daily practice, but focus mostly in the control of dental plaque.

Keywords: oral health promotion, dental prevention, dental preventive education, oral health education

INTRODUCTION

Dental caries and periodontal disease are the most frequently met oral conditions at global level [1], despite the fact that they both are highly preventable [2]. The evolution of caries and periodontitis leads to poor quality of life [3] due to the pain, impaired mastication, esthetic dissatisfaction and increased cost of treatments [4,5,6]. Therefore, the preventive measures are not only desirable but also achievable through proper educational and preventive interventions [7,8].

Dental caries is a multifactorial disease and initiated when the balance between demineralisation and remineralisation is broken in favour of acid attack [9]. Therefore, all the factors that bring a contribution to the increase in acidic level in the oral cavity play a negative role on caries initiation, evolution of relapse after the curative treatment [7]. In early stages, dental caries are represented by white spots, area or demineralisation, that have the potential to be reversed by remineralisation [9].

When it comes to periodontitis, it is characterised by the chronic inflammation induces by the persistence of the subgingival biofilm and the breakage in the balance between bacterial load and host immune response [10]. In early stages it is represented by gingivitis which, as well, has the potential to heal after the biofilm is disrupted and the factors that favour plaque accumulation are removed [10].

Primary prevention is defined as a set of measures to avoid the initiation of the disease, while secondary prevention aims to arrest the early stages of dental carries and third prevention to avoid complications [1,2,11].

Part of the carious and periodontal risk factors are behavioural factors and have a strongest impact [7,8]. Regarding the dental caries, such risk factors are consumption frequently and in high quantities of sugars, improper or irregular oral hygiene, low exposure to fluoride [7], while for periodontal disease, besides the improper oral hygiene, as common factor with dental caries, smoking has a great impact [8].

According to World Health Organization recommendations [12], the control of these risk factors should be in the first place managed though oral health promotion programs so that the key messages reach mass population and especially vulnerable communities. However, dental practitioners play an important role in the prevention and there are updated protocols that aims to guide the dental professionals to get actively involved in primary and secondary prevention and to move away from only curative treatments, thus tertiary prevention [13]. Therefore, dentists are encouraged to established individualised recall intervals for maintenance, to offer dietary and smoking avoiding counselling and oral hygiene instruction to apply sealant and fluoride varnishes to prevent and disrupt the progression of incipient carious lesions [11,14-18]. Unfortunately, dentists are predominantly treatment oriented, focusing in their daily practice on restorative care, in order to offer curative treatments for the already present effects of the progression of the disease [19]. In addition, on long term, there is evidence that prevention is more cost-efficient than treatments, interventions for education and prevention reduces cost for dental treatments which is in favour of patients and healthcare systems [20] without dental offices decreasing their activity and revenues but just by shifting from treatment-oriented to preventive-oriented procedures as well as reaching larger communities [21].

Aim and objectives

The aim of the present study was the assessment of Romanian dental practitioners' interest and involvement in oral health promotion and dental prevention in their daily practice.

MATERIAL AND METHODS

A cross-sectional pilot study was conducted in June-July 2021 by a research group from the Faculty of Dental Medicine of the "Carol Davila" Medicine and Pharmacy University (Bucharest, Romania) on a sample of 66 Romanian dentists. Subjects invited to participate in the study were assessed used a self-administered online questionnaire and prior to invitation they were informed about the survey in respect to the Declaration of Helsinki and the current European privacy law, by including in the introduction section of the questionnaire, the scientific aim of the study, its anonymous character and assuring their right to interrupt the completion of the form at any moment in case of withdrawal. Participants who agreed to take part in the study expressed their consent by completing the survey. No personal data were collected through the form and, as an anonymous web-survey, no sensitive data were collected.

RESULTS

The study population had a mean age of 37.59 ± 9.66 years and 74.24% (49 subjects) were females. All the participants in the study were practicing dentistry in private dental offices and were not involved in academic activity in oral healthcare area. They declared a mean post-graduate clinical experience of 11.28 ± 9.35 years, 62.12% (41 subjects) practising predominantly general dentistry while the others limiting their practice to Endodontics (7.58%), Periodontics (6.06%), Pedodontics (6.06%), Oral Implantology (6.06%), Prosthetics (4.55%), Oral Surgery (4.55%), or Orthodontics (3.03%). When it comes to their professional degree, 56.06% (37 subjects) were general dentists, 19.70% (13 subjects) were dental specialists while 24.24% (16 subjects) were dental residents.

Regarding the self-reported involvement in oral health promotion and prevention in their daily practice, 62.12% declare they include this aspect to a large extent (Table I). When it comes to updating their education regarding dental prevention, 83.33% stated that they do it as frequently as there is such an opportunity and it was observed that as reported sources of education there are not only formal scientific events (courses/congresses/webinars) but also informal discussions either on-line in certain groups of dental professionals on social-media or with medical representatives of oral healthcare products companies (Table I).

Table I. Self-reported integration and continuing education of oral health promotion and prevention among dentist

Assessed parameter	**Answers**	**% (N)**
Self-reported integration of oral health promotion and prevention in daily practice		
	To a very large extent	61.12% (41)
	To a large extent	12.12% (8)
	To a moderate extent	13.64% (9)
	To a small extent	9.09% (6)
	Not at all	3.03% (2)
Frequency of updates on education regarding oral health promotion and prevention		
	As frequently as there is an opportunity	83.33% (55)
	Annually, as part of Continuing	7.58% (5)

Assessed parameter	Answers	% (N)
	Dental Education events	
	Seldom	9.09% (6)
Sources of information for updates on education regarding oral health promotion and prevention		
	Courses/congresses	66.67% (44)
	Webinar	59.09% (39)
	Scientific journals	51.52% (34)
	On-line professionals groups on social media	46.97% (31)
	Medical representatives of oral healthcare products companies	60.61% (40)

Assessment of the risk factors for oral health and counselling behavioural change in this regard, was performed at initial appointment and examination in the dental office by 93.94% (62 subjects). However, during subsequent visits to the dental office in different phases of dental treatments and post-treatment, oral hygiene was observed to be the only risk factor taken into consideration to be followed by the dental practitioners more frequently during the therapeutic phase compared to maintenance/monitoring phase (Figure 1)

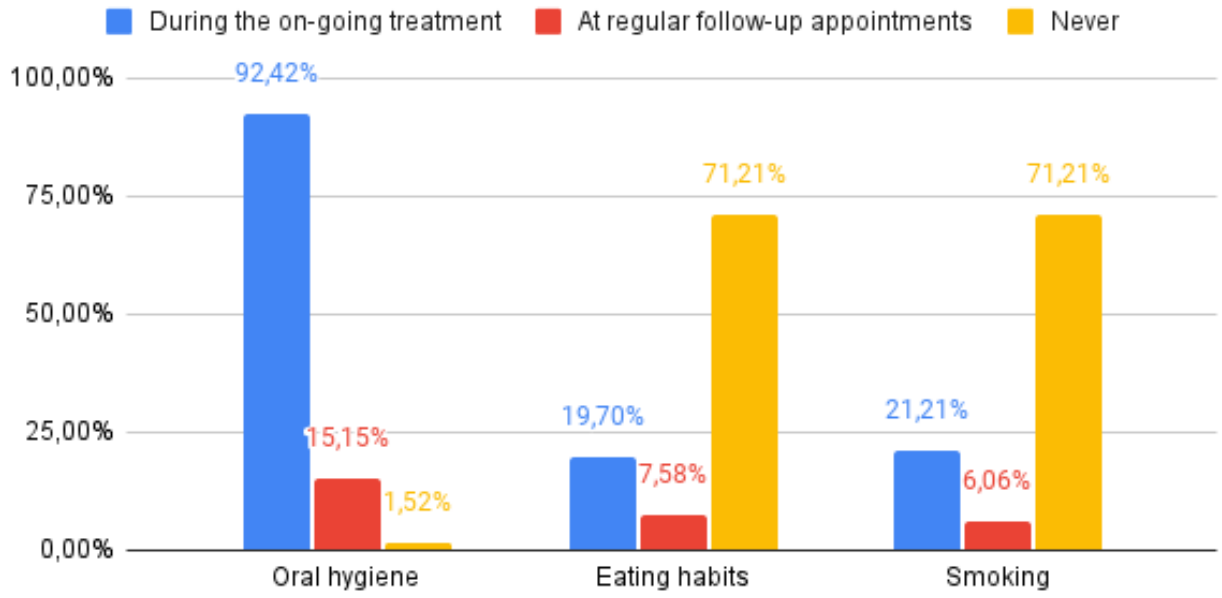

Figure 1. Assessment of risk factors and counselling by the dentists during different therapeutic phases

Results regarding the involvement of participants in oral hygiene counselling showed that toothbrushing technique with a manual toothbrush as well as flossing were the most frequently oral hygiene habits approached by the dentist during daily oral healthcare educative session offered to the patients. Interdental brushes were the product with the least involvement of dentist in the recommendation for the patients. When it comes to the education method used by the dentists in the dental office, verbal description was most frequently mentioned, irrespective of the oral hygiene product; practical methods were less used and demonstration on educative model was preferred (for all the products except for

dental floss) over guided/supervised practice directly by the patient in the oral cavity during the counselling session (Table II).

Table II. Educative methods used by dentists in counselling the patients regarding oral hygiene

	Oral hygiene counselling				
	Manual toothbrushing	**Powered toothbrushing**	**Dental floss**	**Interdental brushes**	**Oral irrigator**
mentioning the product	13.64%(9)	43.94%(29)	62.12%(41)	33.33%(22)	18.18%(12)
verbal description of the product and technique	77.27%(51)	63.64%(42)	63.64%(42)	37.88%(25)	54.55%(36)
demonstration of the technique on a model	71.21%(47)	33.33%(22)	50.00%(33)	22.73%(15)	16.67%(11)
guided and supervised practice of the technique in oral cavity in the dental office	37.88%(25)	21.21%(14)	56.06%(37)	19.70%(13)	7.58%(5)
presentation of a video with the technique	30.30%(20)	36.00%(24)	19.70%(13)	15.15%(10)	34.85%(23)
offering informative flyers/brochure about the product/technique	4.55%(3)	3.03%(2)	1.52%(1)	1.52%(1)	1.52%(1)
not involved	0%(0)	3.03%(2)	3.03%(2)	9.09%(6)	1.52%(1)

When dentist approach patients' smoking behaviour, only 50% of them inform the patients about the potential harmful risk for oral health as well as for the impact on the dental treatment. More dentists recommend reducing the number of cigarettes smoked daily over either temporary quitting smoking during the dental treatment or completely stopping smoking. When it comes to practical advice for the patients to apply the recommendations, a low percent of dentists redirect or encourage the patients to enroll in specific counselling and supporting programs to stop smoking, or to use alternative products (Table III).

Table III. Dentists' attitude toward patients who smoke

Smoking counseling	
recommend quitting smoking	46.97%(31)
recommend reducing the daily number of cigarettes	57.58%(38)
recommend specific programs for quitting smoking	7.58%(5)
recommend alternative smoking products	7.58%(5)
recommend temporary avoiding smoking during the dental treatment	48.48%(32)
refusing to perform dental treatments until quitting smoking	13.64%(9)
informing regarding the risk of smoking on oral health	50.00(33)
not involved	4.55%(3)

When it comes to delivering professional dental cleanings as part of preventive and maintenance phases of dental treatments, 89.39%(59 subjects) reported regular recalls for such a procedures based on patients' notification at certain intervals, the rest of dentists participants in the study leaving in patients responsibility to decided when they need a professional cleaning after the active phase of the dental treatment.

DISCUSSIONS

In the present study, dentists reported in large proportion their interest in integrating oral health promotion and preventive procedures in their daily practice as well as in updating their knowledge regarding this aspect through different forms of continuing dental education. Therefore, in line with the conclusions derived from "Preventive in practice - making it happen" Conference in 2014 and which aimed to establish a consensus regarding how oral diseases could be prevented in practice [21], institutions involved in under and post-graduate education as well as continuing dental education are encourage to offer

opportunities for dentists to train also for prevention and oral health promotion in their daily practice. In our study, dentists were most involved, as part of preventive measures, in the control of dental plaque, not only through professional cleanings but also through patients oral self-care counselling. The control of the biofilm is of outmost importance for prevention of both dental caries and periodontal disease [7,11], thus, this approach, with priority, among the dentist, is appropriate. However, there was observed a lack of involvement of dentists in recommending interdental brushes or oral irrigator which in cases of periodontal patients have a greater impact compared to dental floss [22]. In addition, dentists showed a greater involvement in oral hygiene counselling through verbal description or demonstrations on models, and less in developing practical skills of patients, the least method showing, from previous research on experiential learning, greater improvements in oral hygiene-related behaviour and control of dental plaque [23]. Unfortunately other risk factors with eating habits are often neglected by the dentists in our study, despite the international recommendations for the dentists to get involved in counselling the patients, as a common approach for both oral and general health to control non-communicable diseases [7,18]. In the present paper, the report did not include the results of the assessment of dentists' involvement in application of fluoride products (as part of dental caries prevention) since it is the aim of a related survey in our research.

CONCLUSIONS

In the current study dentists declared in large proportion their interest in involving in oral health promotion and prevention as well as updating their education regarding this aspect. However, in the studied sample dentists were inclined toward the control of biofilm, not only professionally in the office but also at home by the patients with their daily oral hygiene routine, and less concerned about other behavioural risk factors like smoking and eating habits.

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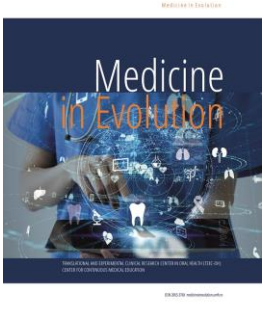
Applications of thyme extracts on diseases of the oral cavity



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Abstract

For hundreds of years, herbal medicines have been used to treat various diseases of the oral cavity or to maintain oral hygiene. Currently, the growing resistance of microorganisms to the antimicrobials used, in combination with the emergence of emerging diseases, requires the urgent development of new, more effective drugs. Plants are a unique and renewable source for the discovery of new antimicrobial, antiinflammatory, antifungal, anticancer, etc. compounds.

The purpose of this article is to present the use of thyme extracts in diseases of the oral cavity, such as caries, gingivitis, periodontitis, oral cancer, oral candidiasis.

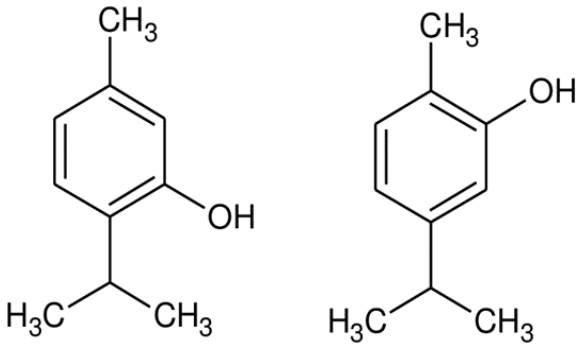
Keywords: Thyme, antimicrobial, anticancer, antifungal

INTRODUCTION

Thyme (Thymus vulgaris L.) is a plant native to the Mediterranean regions (Figure 1) commonly used as a culinary plant and also with a long history of use for various medicinal purposes [1]. Thyme, in the form of an infusion, was used as a mouthwash or gargle for inflamed gums and sore throats. Thyme essential oil is obtained from leaves and inflorescences by the method of steam distillation.

The major bioactive compounds in thyme essential oils are thymol and carvacrol (Figure 2). Thymol (named IUPAC) is a monoterpene phenol naturally derived from thyme and isomer of carvacrol, with the formula $C_{10}H_{14}O$.

Figure 1. Thyme plant



(a) (b)

Figure 2. (a) thymol, (b) carvacrol

Thymol (2-isopropyl-5-methylphenol) is found in the essential oils of thyme and oregano and has a strong medicinal, herbaceous scent. Carvacrol (5-isopropyl-2-methylphenol) is found in the essential oils of thyme, sage and oregano and has a phenolic, spicy scent. Eugenol (4-allyl-2-methoxyphenol) is also a phenol found in the essential oils of cloves, cinnamon leaves, chilli, ylang-ylang and rose. It has a spicy, pungent odor, typical of cloves.

The physical and chemical properties of phenols are: slightly acidic; very reactive; similar in action, but much stronger than alcohol.

Phenol-rich essential oils must be handled with great care. They can be toxic to the liver and irritating to the skin and mucous membranes. Phenol-rich essential oils that are irritating to the skin include cinnamon, cloves, anise oil, basil, tarragon, thyme and oregano.

Aim and objectives

The purpose of this review is to present the use of thyme extracts in diseases of the oral cavity, such as caries, gingivitis, periodontitis, oral cancer, oral candidiasis.

THERAPEUTIC PROPERTIES OF THYME

Thyme is widely used in the pharmaceutical field, mainly due to its germicidal and antiseptic properties of phenolic components.

Thymol is a biocide with strong antimicrobial properties, both used alone and in combination with other biocides, such as carvacrol. Thymol can also be used to reduce bacterial resistance to other medicines, such as penicillin. This compound also has antioxidant, anti-inflammatory, antispasmodic, anticancer, antifungal, antileishmanial, antiviral properties and potential as a growth stimulant and immunomodulator [2,3]. Nano

capsules containing thyme and thymol essential oils can be used successfully in medical practice [4].

Supercritical fluid extraction (EFS) of plant material with solvents such as CO2, propane, butane or ethylene is considered an attractive extraction method compared to conventional techniques such as steam distillation or Soxhlet extraction, as it allows the processing of plant material at temperatures reducing the contamination of the solution with solvent residues and thermal degradation [5].

Ocaña and Reglero studied thyme oils of three different species (Thymus vulgaris, Thymus zygis and Thymus hyemalis), using EFS with CO2 as solvent. The main compounds obtained were thymol, 1,8-cineole, carvacrol and borneol (Figure 3). They found that the extracts studied showed anti-inflammatory properties by reducing the release of pro-inflammatory cytokines and by increasing anti-inflammatory secretion in activated macrophages. The results suggest that essential oils from thyme extracts could be used to treat chronic diseases based on inflammatory processes.

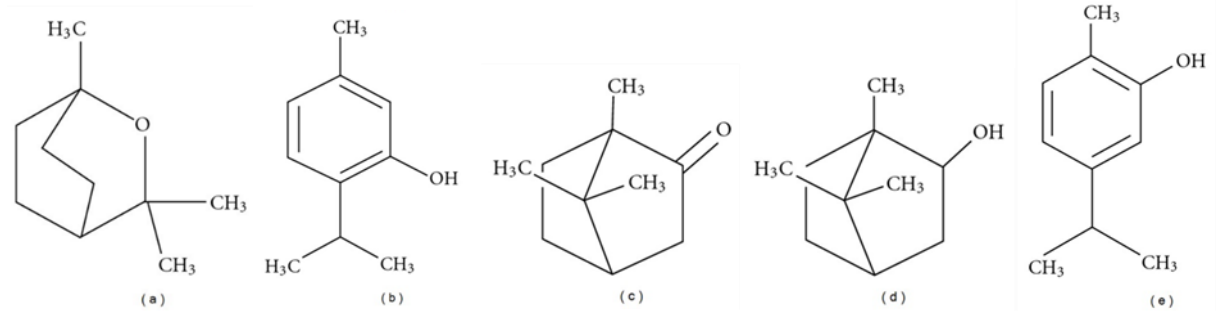


Figure 3. Chemical structures of the main compounds present in thyme extracts: (a) 1,8 cineole, (b) thymol, (c) camphor, (d) borneol, (e) carvacrol [5]

The active components of thyme glycol extract show anti-inflammatory and astringent properties that can be used in dentistry. Dental caries, periodontal disease and streptococcal pharyngitis are the most common infectious diseases in the oral cavity. Thymol appears to inhibit the growth of pathogens in the oral cavity and, in combination with other essential oils, may reduce tooth decay [6,7]. Karyogenic bacteria and periodontal bacteria are present in the dental plaque as biofilms. Thymol has membranotropic effects, the perforation of the membrane being the main mode of action of this substance [8].

Oral candidiasis can manifest as a mild or severe oral fungal infection. This infection results from the overgrowth of normally present Candida species in the oral cavity in small amounts due to predisposing factors. The structure of Candida biofilm is particularly difficult to eradicate because it is highly resistant to antifungal agents [9,10]. Various studies have shown that thyme and thymol oils, alone or in combination with antifungal drugs, have antifungal and anti-biofilm activities, and have suggested their incorporation into pharmaceutical preparations [10,11].

Studies have shown that carvacrol has a wide range of biological activities, such as antibacterial, antifungal, insecticidal, antioxidant and antitumor. The antigenotoxic potential of this monoterpene phenol has also been studied. In vitro and in vivo studies have shown the ability of carvacrol to reduce DNA damage induced by some genotoxic agents. Its ability to protect lymphocytes against DNA damage may be due to its antioxidant effects. Carvacrol acts as a free radical scavenger, which may explain its anti-mutagenic activity.

DISCUSSIONS

Fani and Kohanteb demonstrated *in vitro* antimicrobial and antifungal activity of Thymus vulgaris oil on oral pathogens: Streptococcus pyogenes, Streptococcus mutans, Candida albicans, Porphyromonas gingivalis and Aggregatibacter actinomycetem in the oral mucosa. Thyme oil, mixed with other essential oils, could be used in mouthwash, toothpaste, or aromatherapy to prevent and treat infections in the oral cavity [12].

Various studies have aimed to potentiate the antimicrobial activity of natural extracts against oral bacteria through a synergistic combination and nanoencapsulation. Lee et al. have shown that nanoencapsulation can significantly increase the synergistic antimicrobial activity of clove and thymol oil and maintain it in the oral cavity for longer [13].

Sienkiewicz et al. demonstrated that Thymus vulgaris oil inhibited the growth of strains of bacteria isolated from patients with infections of the oral cavity. Thyme essential oil has been shown to be effective against antibiotic-resistant strains of the bacteria tested [14].

Carvalho et al. aimed to evaluate the antibacterial and antibiofilm effects of essential oils and herbal toothpastes against bacteria associated with diseases of the oral cavity. The results of the study show that the essential oils of cloves, oregano, cinnamon thyme can be added to fluoride-free toothpastes to increase the inhibitory effects against bacteria from carious lesions and periodontal disease. Thyme essential oil can increase the effectiveness of chlorhexidine-containing toothpastes [15].

Studies of thyme extracts on Streptococcus mutans have shown a decrease in bacterial viability, depending on the time of action and concentration [16].

The total essential oil obtained from the aromatic plant Thymus vulgaris L. and its compounds, in particular linalool, thymol, carvacrol and their thymoquinone and thymohydroquinone derivatives, were tested *in vitro* to determine the inhibitory activity on acetylcholinesterase, thus preventing the breakdown of acetylcholine, a key clinical enzyme involved in neurodegenerative diseases. The inhibitory effect of carvacrol was 10 times stronger than that of its isomer thymol, although they have a very similar structure (Figure 1) [17].

Researchers are studying the use of herbal mouthwashes to treat oral cancer. A team of researchers from the University of Texas, San Antonio, USA, found that thymol is effective in preventing the proliferation of oral cancer cells in animals. Thymol selectively destroys cancer cells by acting on mitochondria, which produce the energy needed for cancer cells to grow. Thymol also induces apoptosis [18]. The University of Texas Health San Antonio holds a patent for thymol mouthwash to prevent oral cancer and over its mechanism of action to be used as a treatment for oral cancer.

Sertel et al. demonstrated that thyme essential oil has cytotoxic activity against squamous cell carcinoma of the head and neck [19].

Mutluay Yayla et al. conducted a study on rinsing the oral cavity with hydrosol with sage, thyme and mint tea, which resulted in attenuation of oral mucositis induced by chemotherapy [20].

Rezzoug et al. studied the chemical composition and antioxidant, antimicrobial and anticancer activities of ethanolic extracts (EE) and essential oils (EO) from two species of the Lamiaceae family, Ocimum basilicum L. and Thymus algeriensis Boiss. & Reut. The essential oils were obtained by hydrodistillation of the aerial parts of the plants and were analysed by Gas chromatography – mass spectrometry (GC-MS). Antimicrobial activity has been evaluated against several pathogens characteristic of gram-negative bacteria, gram-positive bacteria and fungi. Ethanol extracts and essential oils from both plants showed moderate antioxidant activity and moderate to weak antimicrobial activity. Anticancer activities have only been associated with EO from both plants [21].

Labib and Aldawsari set out to investigate the possibility of incorporating essential oils or active ingredients extracted from them into preparations used in the oral cavity. These preparations were evaluated for their antifungal activities, pH, viscosity, erosion and water absorption characteristics, mechanical properties, mucoadhesion, *in vitro* release behavior. The preparations showed considerable antifungal activity and acceptable physical properties [22].

Braga et al. tested the anticandidal activity of thymol, the main component of thyme oil, and eugenol, the main component of clove oil, alone or in combination, by investigating their ability to interfere with the architecture of the Candida albicans coating. Both molecules altered the morphogenesis of the cover, the effects of thymol being more pronounced than those of eugenol. Some combinations of the two molecules have led to a synergistic effect, suggesting their potentiation on inhibiting the colonization and infectivity of Candida albicans [23].

Thymol, like other ethanolic extracts of some therapeutic plants, has been studied in vital pulpotomies in children, at the teeth of the primary dentition that benefited from this therapeutic indication. Alolofi et al. they obtained promising rates of clinical and radiographic success of thymus vulgaris and propolis compared to formocresol [23].

CONCLUSIONS

Consumption of thyme in the form of flowers and leaves is safe. Caution should be exercised in the use of thyme oil, which should not be taken orally as such, but should be diluted with a diluting oil (olive or almond oil) before use.

The active components of thyme extracts show anti-inflammatory, astringent, antimicrobial, antifungal and antitumor properties that can be used successfully in dentistry. The incorporation of thyme extracts in the mouthwashes has shown a decrease in the adhesion of Streptococcus mutans to oral epithelial cells. Thymol, the main ingredient in thyme extract, is a biocide with strong antimicrobial and antitumor properties.

Identifying the active ingredients of thyme and evaluating their effectiveness in various treatments can provide useful alternatives for the development of new drugs effective in the treatment of oral diseases. There is a clear need for alternative therapies with less toxic effects.

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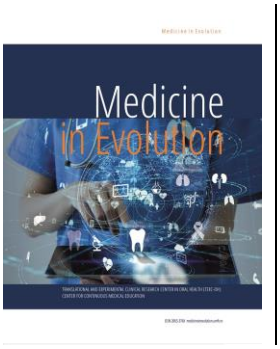
SARS-CoV2 pandemic in Arad



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Abstract

The SARS_CoV_2 pandemic is a lesson about biological threats, which put health systems under extreme stress. In Arad County it affected 16.4% of the population (n = 67,434 Covid_19 cases), the fatality rate being 2.71%. Four waves manifested between 01.03.2020 –31.03.2022 causing 1,828 deaths. The age distribution of the cases indicates an increased prevalence at 30-59 years and increased death rates at 60-80 years. The relative risk RR of death from Covid_19 in males compared to females is 1.3216 (P <0.0001). RR of death in rural versus urban is 1.3955 (P <0.0001); 52.51% of deaths occurred in males, 57.76% in rural areas and 86.54% in patients over 60 years. The sequencing of deaths according to waves and the odds ratio of deaths in wave 4 compared to waves 1-3 was 1.6527 (P <0.0001), 46.82% of deaths being recorded in wave 4 of the pandemic, predominantly caused by the Delta variant.

Keywords: Covid 19, Relative risk, Odds ratio

INTRODUCTION

An airborne pandemic is a challenge for the best health systems, even for those with complex infrastructure. Romania has proven multiple vulnerabilities, due to the initial inability to generalize the PCR molecular diagnosis, low number of beds for intensive care of critically ill patients, institutional communication, etc. Arad County presents additional risks for infection and death, because: the population ageing, the elderly living either in nursing homes or in extended families, with children and grandchildren who are sources of infection, being neither autonomous nor independent; increased prevalence of chronic diseases such as hypertension, diabetes, neoplasms, obesity; the health infrastructure is insufficiently modernized and the vaccination rate is 50%.

Aim and objectives

We analyzed the distribution of SARS_CoV_2 infection cases in the population of Arad County, from the beginning of the pandemic until 31.03.2022, to identify the highest prevalence rate, frequency in areas of residence and by gender, the most affected age groups both by infections as well as death rates.

MATERIAL AND METHODS

In this descriptive, retrospective study to determine the prevalence of SARS_CoV_2 infection during the pandemic, deaths and outbreaks during this time, with the determination of the risk of death by gender, age category, residence and viral subtype. The data were sectorized in relation to the evolution of the pandemic, in 4 waves, between 01.03.2020 - 30.06.2020, between 01.07.2020 - 31.12.2020, between 01.01.2021 - 31.07.2021 and between 01.08.2021 - 31.03.2022. As methods of statistical analysis we used the quantification between exposure and result, as a measure of association between two variables, by establishing the Relative risk and the Odds ratio.

RESULTS

There were 67,434 cases, in ascending series, with 706 cases in the first wave, followed by 13,403 cases, respectively 9,669 and 43,656 in waves 2- 3-4 [1]. Figure 1 shows the cases, deaths and their linear trendlines. In table 1 are all cases, all deaths and fatality rates in all four waves. In total, the fatality rate reached 2.71%.

Table 1. Number of cases, deaths and fatality rates Covid_19 related

category	cases	deaths	fatality rate
first wave	706	79	11.1898
second wave	13403	498	3.715586
third wave	9669	395	4.085221
fourth wave	43656	856	1.960784
total	67434	1828	2.710799

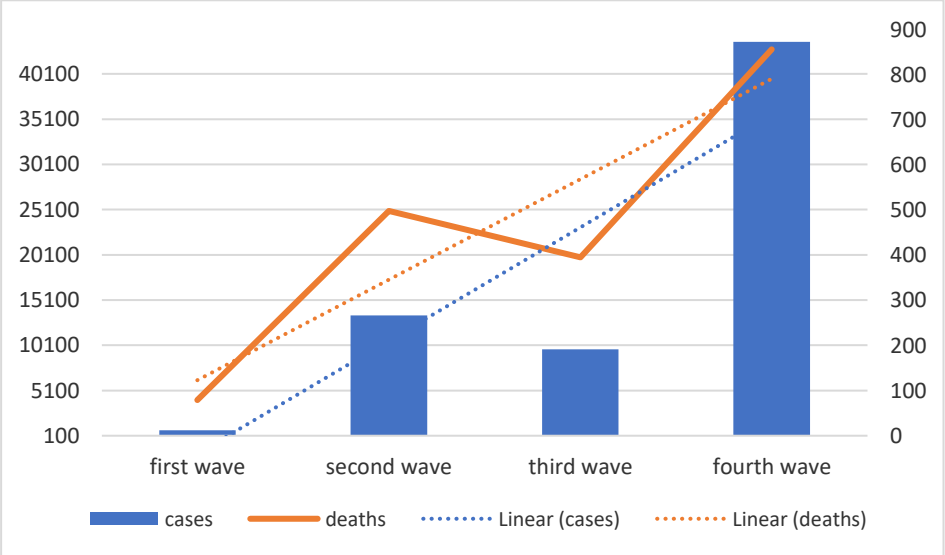

Figure 1. Covid-19 cases, deaths and their trendlines

The percentage of SARS_CoV_2 infections was 16.4% of Arad County population in pandemic, which places Arad County on the 13th place in the ranking of counties; 17.57% of all cases were hospitalized. The gross mortality rate, representing deaths caused by SARS_CoV_2 infection relative to the population at risk per 100 inhabitants, for the pandemic period, was 0.4%. The age distribution of cases indicates an increased prevalence of infection in the 30-59 age group and increased death rates in the 60-80 age group and above, Table 2.

Table 2. Age category distribution for cases, ptevalence and death rates

Item	0-9 years	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60-69 years	70-79 years	80 years and more
Cases	2377	5141	6828	11250	12825	11186	9310	5827	2693
Deaths	0	0	5	15	66	160	482	594	506
Population	40970	44235	44490	56199	66081	55772	54595	33640	18586
prevalence %	5.8	11.62	15.35	20.02	19.41	20.06	17.05	17.32	14.49
death rate %	0	0	0.01	0.03	0.1	0.29	0.88	1.77	2.72

The distribution of cases by gender was 54% in favor of women, 66% of cases were registered in urban areas and 52.28% of cases were registred between 30-59 years old. However, the situation was different for deaths: 52.51% of deaths occurred in males, 57.76% of deaths were registred in rural areas and 86.54% of deaths occurred in patients over 60 years, table 3.

Table 3. Distribution of Covid_19 cases by gender and area of residence

	F	M	total	Urban	Rural
cases	36604	30833	67437	44254	23183
deaths	868	960	1828	1056	772

The relative risk (RR) of Covid_19 related death in males compared to females was 1.3216. Deaths depending on the residence put at risk the patient from the rural area in Arad County - RR 1.3955, table 4.

Table 4. Relative risks of death by gender and residence

item	RR	95% CI	z statistic	Significance level
RR deces M versus F	1.3216	1.207 to 1.4471	6.027	P < 0.0001
RR deces R versus U	1.3955	1.2736 to 1.5291	7.143	P < 0.0001

Depending on the sequencing of deaths by waves, the Odds ratio OR in wave 4 compared to wave 1-3 was 1.6527, table 5, 46.82% of deaths being recorded in wave 4 of the pandemic, predominantly caused by the Delta variant.

Table 5. Odds ratio for deaths in fourth wave compared to 1-3 waves

Odds ratio for deaths in fourth wave compared to those of 1-3 waves	1.6527
95% CI	1.5056 to 1.8143
z statistic	10.559
Significance level	P < 0.0001

The filiation of cases in infectious diseases is difficult to establish especially in airborne infections but the existence of some outbreaks can be documented, even if not exhaustively. Of 109 documented outbreaks, 61% occurred in residential centers for the elderly, Table 6, source Arad Public Health Department.

Table 6. Documented Covid_19 outbreaks

Source	outbreaks
Community	12
Industrial	14
nursing home	67
Hospitals	16
Total	109

DISCUSSIONS

The highest prevalence rate, both for illness and death: 01.08.2021 - 31.03.2022, wave 4, when Delta (The Delta variant being first detected in India in May 2021) and Omicron (identified in numerous countries in November, 2021) subtypes predominated, characterized by increased virulence, in the case of Delta strains and by increased transmissibility, in the case of Omicron strains [2]. Delta contains the D614G mutation, plus many additional ones not seen in other variants of concern, which is thought to increase infectivity, and may help the virus to evade destruction by immune cells [3].

The number of infections is higher in urban areas but the risk of death is higher in rural areas. Urban areas are, in fact, the place where the most cases of infection is coagulated due to human overcrowding. On the other hand, the rural environment shows less addressability to the diagnostic and treatment procedures, which may be an explanation for the increased mortality; other countries experienced also the same differences, where the case rates and mortality rates were positively correlated with pre-existing social vulnerability [4].

The number of infections is higher in females but the relative risk of death is higher in males. Male gender appears to be a formidable risk factor for both the severity of the disease and prolonged hospitalization and death worldwide [5].

The most frequently affected age groups are those who are socio-professionally active, but the age groups with the highest death rates are those over 60 years of age, results that can be found in other research [6]. This study identified the highest Covid _19 prevalence rates, frequency of cases in relation to residence and gender, the most affected age groups by both

infection and death rates, including the link between dominant wave 4 strains in relation to the death rate and prevalence.

CONCLUSIONS

The measures required as a result of these results have to be centred on protecting the categories at risk of death, respectively the elderly in residential centers and families composed of multiple generations, especially in rural areas. Last but not least, the medical staff, professionally exposed, is at increased risk of the disease, in the absence of complete and available protective equipment.

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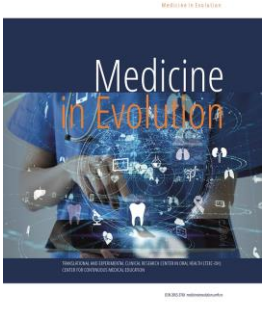
Comperison between an aesthetic metal free band-and-loop space maintainer and a metal one



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Abstract

This paper deals with the use of a device similar in design to the band-and-loop space maintainer, but with a better aesthetic component. The manufacture of this device is made of aesthetic, elastic materials, which will not compromise the ability to maintain adequate space on the dental arches and will not interfere with the eruption of permanent teeth. The ability to provide greater comfort to the patient compared to the classic maintainers was also pursued.

A case of a bilateral second temporary molar loss was chosen to apply a classic stainless steel space maintainer and the aesthetic one, obtained from a thermoplastic material (Vertex Thermosense).

The essential conditions that any space maintainer are met by the appliances: both managed over time to maintain the mesio-distal dimension of the apparent edentulous gap, to withstand in time from a structural and dimensional point of view, it also did not disturb the normal functionality of the stomatognathic system.

Keywords: thermoplastic resin, space maintainer, metal-free, aesthetic

INTRODUCTION

One of the most important factors influencing the growth and development of the stomatognathic system is the maintenance of a suitable space for the correct alignment of permanent teeth on the dental arches, or in other words the management of the space [1]. The reduction of the space on dental arches due to the early loss of the temporary teeth disrupts the eruption of the permanent teeth, contributing to the installation of dento-maxillary anomalies, which will require complex and expensive treatments [2].

The space maintainer is a relatively simple device, with the help of which we have the possibility to maintain an adequate space at the level of the dental arches until the eruption of the permanent replacement teeth, without interfering with it [3]. Preservation of this space counteracts the appearance of dento-maxillary anomalies with beneficial consequences on the dento-maxillary system.

For a long time, different types of space maintainers have been used successfully in paediatric dentistry practice. One of the most used space maintainers is the band and loop [4]. This metal device ensures optimal control of the space, without interfering with the eruption of permanent teeth. A disadvantage of this space maintainer is its aesthetic performance, which leaves much to be desired [5].

Aim and objectives

This paper deals with the use of a device similar in design to the band-and-loop space maintainer, but with a better aesthetic component. The manufacture of this device is made of aesthetic, elastic materials, which will not compromise the ability to maintain adequate space on the dental arches and will not interfere with the eruption of permanent teeth. The ability to provide greater comfort to the patient compared to the classic maintainers was also pursued.

The performance of the aesthetic space maintainer space will be correlated with that of the classic stainless steel one, made of metal alloys, following its resistance over time, keeping the space on the arch, the comfort level offered to the patient and its dimensional stability.

MATERIALS AND METHODS

To obtain the aesthetic space maintainer, a case of an 8-year-old patient was selected, that had early loss of the lower second molars. In order to be able to make a comparison between the classic band and loop made of stainless steel and the aesthetic space maintainer, it was decided to apply both, on different quadrants.

After selecting the case, an impression of the lower arch was taken, using an alginate irreversible hydrocolloid, Hydrogum 5 from Zhermack, in a standard plastic tray. After making the impression, it was sent to the dental laboratory for the laboratory steps.

A class III plaster dental cast was made based on the impression, and after, a duplicate cast was obtained to design the wax model of the future space maintainer (Fig. 1).

Figure 1. Wax-up model of the future space maintainer

After making the wax-up model, it is packed in a special metal injection sink, with plaster of class III. Wax pouring rods were installed, with a diameter of 5 mm. Because the maintainer is small, it was packaged together with other prosthetic works (Fig. 2), then, the second part of the conformer is poured.

Figure 2. Investing of the wax pattern

After the plaster setting, the sink is immersed in hot water to wash the wax inside. At the end of this stage, the packing sink is kept at a temperature of 30 - 40 °C. This is followed by insulation of the sink using Thermoflow from Vertex. After insulating the sink, the thermoplastic material is injected at a temperature of 290 °C for 17 minutes. ThermoSens from Vertex was used for injection. This is a monomer-free, polyamide-type injectable material with high elastic fracture resistance. It has a low allergenic risk and is available in several shades to facilitate the aesthetic effect of the future work.

At least 30 minutes after pouring, the space maintainer is unpacked and the processing and polishing starts. For this stage, different burs and polypants are used, specially designed for the processing of this material. After completing the technological stages, the aesthetic space maintainer is brought to the dental office for the next clincal steps (Fig. 3).

Figure 3. Aesthetic space maintainer

RESULTS

The patient was called back for the intra-oral check and the adaptation of the maintainer. The aesthetic space maintainer adapts intimately to the permanent first molar, without the need for further processing and adjustments. After that, the cementing step is performed in the patient's oral cavity.

For the cementing stage, RelyX Unicem 2 Automix from 3M ESPE was used, a dual cement based on resin, two-component, self-adhesive, with self-curing reaction, but which can also be photo-activated. The space maintainer and the tooth was cleaned and isolated with cotton rolls. The self-adhesive cement was applied to the space maintainer with the help of special cannulas, after which it was applied in the oral cavity, on the lower first permanent molar. The cement was then photopolymerized for 1-2 seconds to facilitate cleaning of excess material. The dual cement makes the final setting 6 minutes after mixing the two components.

After cementing, the occlusion was checked with articulation paper and it was observed that no adjustments were necessary for adaptation (Fig. 4).

Figure 4. Intraoral aspect of the space maintainer after cementation

Because an aesthetic comparison of a metal space maintainer and the space maintainer made by injecting a thermoplastic material was desired, the first one was also applied on the contralateral hemiarch, according to the classical technique (Fig. 5).

Figure 5. Classic space maintainer cemented on the other quadrant

The patient presented for a check-up after a period of 4 months, to check the changes over time on the aesthetic space maintainer, compared to the metal one. It was observed that the aesthetic device maintained its dimensional stability, appearance and integrity over time, without noticeable changes.

DISCUSSIONS

This paper aims to make a comparison between a classic space maintainer and a more modern and aesthetically optimal variant, but the functionality of the aesthetic space maintainer and its clinical viability were also taken into account.

The aesthetic improvement of the new space maintainer is obvious, but the use of a thermoplastic injectable material brings with it certain disadvantages: one of the main disadvantages is the cost which exceeds the cost of a classic space maintainer [6]. Another disadvantage is the process of making this device, which requires special materials and special equipment, which are expensive for the dental laboratory and for the patient and also the technique is more laborious and complicated [7].

For a space maintainer made of this thermoplastic material, processing and polishing is essential, because if they are not made perfectly, the maintainer tends to facilitate the adhesion of bacterial plaque, and the design of the maintainer makes it quite difficult to polish in certain areas. By providing enough space for the eruption of the permanent replacement tooth and not being in contact with the gingivomucosa, optimal hygiene is facilitated. Arikan V et al., 2015, studied the presence of different microorganisms like Candida and Enterococcus faecalis on both fixed and removable space maintainers in patients with high bacterial plaque index [8].

The aesthetic appearance of this device is improved, compared to a classic space maintainer, offering a satisfactory result and better compliance from the paediatric patient.

Another advantage of the aesthetic maintainer is the ease of the clinical stages performed by the dentist, limiting it to the impression stage and the cementing one. At the same time, the patient's comfort increases, the sessions being few and short [9].

The essential conditions that any space maintainer are met by the both appliances: both managed over time to maintain the mesio-distal dimension of the apparent edentulous gap, to withstand in time from a structural and dimensional point of view, it also did not disturb the normal functionality of the stomatognathic system [10].

CONCLUSIONS

Following the realization of this aesthetic space maintainer, it was concluded that it can be a viable variant of the stainless steel band-and-loop one because it meets the essential requirements of a space maintainer.

The difficulties in making this device do not influence the dental clinician in performing the clinical steps, on the contrary, they are reduced in time and number, which makes it easier for the dentist to opt for such a space maintainer.

The main disadvantage being the cost and the technical stages of realization, not interfering with the fundamental characteristics of the space maintainers, it remains that the choice between such a maintainer and the classic one, to be made by the patient.

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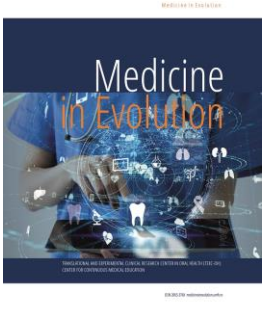
Treatment of special-needs patients under general anesthesia



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Abstract

Dental rehabilitation under general anesthesia is a treatment option for children requiring complex dental treatment, but who exhibit acute situational anxiety and emotional or cognitive immaturity or require dental rehabilitation. The advantages of ambulatory general anesthesia are the efficiency and comfort in performing the intervention. The purpose of this study was to assess the efficacy of dental works under general anesthesia in the case of child patients with neuropsychiatric disorders and of uncooperative ones.

Keywords: psychiatric disorders, general anesthesia, dental treatments

INTRODUCTION

In many countries dental cavies remain one of the most widespread health problems in children. Dental rehabilitation under general anesthesia is a treatment option for children who require complex dental treatment, but who exhibit acute situational anxiety and emotional or cognitive immaturity, or require dental rehabilitation. There are many advantages of ambulatory general anesthesia, such as the efficiency and comfort in performing the intervention.

The use of sedation if a current practice in dentistry and ambulatory oral and maxillofacial surgery. The majority of ambulatory oral and maxillofacial surgery interventions are performed using sedations in association with local anesthesia. Patients with neuropsychiatric disorders pose a real problem in terms of applying dental treatments or oral and maxillofacial surgery. Most of the times, the operating room is a "hostile" environment for the patient, which is why anxiety, fear, agitation, pain are the most unpleasant impressions experienced by them. Therefore, ambulatory general anesthesia is an alternative for most patients with neuropsychiatric disorders. Ambulatory general anesthesia offers a psychological benefit for the patient, in particular for children, because it reduces the period of separation from home and family, avoids the stress induced by hospitalization, reduces the risk of hospital-acquired infections, in particular with immunosuppressed patients and children, and the costs of hospitalization is lower. Often, people with neuropsychiatric disorders can also exhibit other medical conditions (in particular cardiovascular), which is why ambulatory general anesthesia can sometimes pose large problems, and it can also increase the prevalence of postoperative complications, in close connection with medical conditions.

Aim and objectives

The purpose of this study was to assess the efficacy of dental works under general anesthesia in the case of child patients with neuropsychiatric disorders and of uncooperative ones.

The motivation behind this study is the increasingly frequent use of ambulatory anesthesia in patients with psychiatric disorders, and the special importance it has for evaluation and diagnosis, especially since for a majority of patients of this type of the communication between dentist and patient is very difficult. For this reason, we have conducted a prospective study regarding the value of ambulatory anesthesia as method used for the diagnosis and treatment of such patients. The lot of patients studied came from a private clinic in Timisoara. This lot consists of patients being treated over a 3-month period, between March and May 2016. The approval of the ethics commission and the informed consent of the caregivers was obtained before enrollment in this study.

MATERIALS AND METHODS

The patients included in this study were children with psychiatric disorders, who required dental treatment under ambulatory general anesthesia. The total number of admitted patients selected for performing cerebral angiography during the given period is 8, of which 4 were boys and 4 were girls. Of these, 42% had severe impairment of metal capacity, 38% au had moderate impairment, 18% had minor impairment, and 2% had deep impairment.

Anesthetic technique

All patients were scheduled for and underwent to short interventions (approximately 1.5-2 h), low hemorrhagic and respiratory risk interventions, which involved no significant postsurgical impairment. All patients were premedicated 30 minutes before induction with Midazolam administered either orally (0.3-0.5 mg/kg), or intrarectally (0.75-1 mg/kg) or Diazepam administered intrarectally (Desitine: 5 mg or 10 mg – depending on the patient's weight). In both groups, before induction all children were given 10 ÷ 20 μg/kg. Immediately after induction, all the patients were given Paracetamol 20 mg/kg administered either intravenously, or intrarectally for postsurgical anesthesia and Dexamethasone 0.1 mg/kg to prevent postoperative edema. For anesthesia was administered fentanyl 3-5μg/kg in induction. Over the course of the intervention, it was readministered in boluses (1-3 μg/kg), depending on the hemodynamic response of each individual patient. The muscle relaxant – tracrium 0.5 mg/kg was administered in cases where tracheal intubation was not possible by simple administration in induction of propofol in association with fentanyl or sevoflurane. For the entire duration of the surgical procedure, the patients were monitored intra-anesthetic according to the standard established by the American Society of Anesthesiologists (ASA). The dental treatments were performed first, whereupon were performed the tooth extractions. Local anesthetic (xiline 2% with adrenalin 1:100000, < 4 mg/kg) was also administered to all patients for good postoperative analgesia. At the end of the surgical/dental intervention, the continued administration of any oral or intravenous anesthetic was stopped. The tracheal tube was removed only after the reflexes (blinking, swallowing) were present, the state of consciousness resumed (opening the eyes), adequate spontaneous ventilation and cardiovascular function within normal parameters, with proper cleaning of the oral cavity in advance the obstruction of airways with foreign bodies (blood, saliva, compresses, dental debris). The patients were taken out from the operating room only after making sure that they are capable to keep their airway permeable. An anesthesia sheet was prepared for each patient, which record: the age, sex, weight, ASA class, anesthetic technique, hemodynamic and respiratory parameters monitored, the duration of the anesthesia and dental and/or surgical intervention, the treatments.

Immediate post-anesthetic stage

As it is a stage dominated by the remnant effects of anesthesia with the related risks and complications, the patients were supervised in the recovery room. They were standard monitored: clinical monitoring, measuring arterial pressure, electrocardiographic monitoring in the case of patients with associated cardiovascular pathology, pulse oximetry, diuresis, temperature measurement, monitoring the surgical wound until complete recovery (fully awake). The patients' mothers/caregivers were allowed access to the recovery room, given their neuropsychological condition. The patient's evaluation in the recovery room was done by a specially trained nurse with the help of the patients' mothers/caregivers. During the stay in the recovery room, a post-anesthetic sheet was prepared for each patient, which record the patient's condition on admittance, on discharge, postoperative complications occurred (pain, crying-screaming, nausea, vomiting, bleeding, agitation-somnolence), the monitored parameters monitored at established intervals, the treatments administered, when they reached the criteria for discharge. The ranges established were: immediately upon arrival, at 15 minutes and 30 minutes of arrival, respectively, and every half hour until discharge.

Agitation and pain were assessed using a visual analogue scale (VAS), from 0 – no pain to 10 – intense pain. As these were patients with neuropsychiatric disorders who are unable to express their feelings, agitation and pain were distinguished using the following criterion: - severe agitation was suggested by an uncooperative patient, who screams, who cannot be calmed, who tries to leave the bed; - moderate or severe pain was suggested by a crying patient, who is unable to sleep, who emits sounds/vocalizations specific for pain, with

a frowning face, with eyes wide open. In order to assess the optimum time for the patient to leave the recovery room, we used the Aldrete score, on which the maximum score is 10 units and minimum 1 unit. The patients were discharged only after the reaching a score of 9-10. In addition, the patients were discharged from hospital only according to a previously established protocol: vital functions stable for at least 1 h, ability to eat and drink, which also demonstrates the absence of nausea, the absence of vomiting, possible urination, adequate oral hydration, minimum wound drainage, acceptable pain level and capacity to move according to their invalidities. At home, during the first 24 h, the patients' mothers/caregivers were asked to write down the complications that occurred and were interviewed by telephone.

RESULTS

Patient No. 1: 2-year-old
Pathological conditions: Brain disorders, Mental retardation.

Table 1. Patient No. 1

Treatment	Tooth	Element no.
Primary anterior tooth pulpectomy	5.1; 6.1	2
Primary anterior tooth root canal obturation	5.1; 6.1	2
Zirconium pedodontic crown	5.1; 6.1	2
Upper lip frenectomy		1
Retroalveolar radiography pre- and post-surgery	5.1; 6.1	2
Medically-assisted intravenous analgo-sedation – I.C.U	90 min/1 h 30 min	

Patient No. 2: 2-year-old
Pathological conditions: Food allergies

Table 2. Patient No. 2

Treatment	Tooth	Element no.
Preventive primary posterior tooth obturation	5.4; 6.4; 7.4; 8.4	4
Primary anterior tooth pulpectomy	5.2; 6.2; 5.1; 6.1	4
Primary anterior tooth root canal obturation	5.1; 6.1; 5.2; 6.2	4
Zirconium pedodontic crown	5.1; 6.1; 5.2; 6.2	4
Upper lip frenectomy/frenoplasty		1
Medically-assisted intravenous analgo-sedation – I.C.U	180 min/3 h	

Patient No. 3: 2-year-old
Pathological conditions: Brain disorders

Table 3. Patient No. 3

Treatment	Tooth	Element no.
Primary anterior tooth pulpectomy	5.1; 5.2; 6.1; 6.2	4
Primary anterior tooth root canal obturation	5.1; 6.1; 5.2; 6.2	4
Zirconium pedodontic crown	5.1; 6.1; 5.2; 6.2	4
Retroalveolar radiography pre- and post-surgery	2	1
Medically-assisted intravenous analgo-sedation – I.C.U	150 min/2 h 30 min	

Patient No 4: 2- year-old
Pathological conditions: Brain disorders

Table 4. Patient No. 4

Treatment	Tooth	Element no.
Primary anterior tooth pulpectomy	5.2; 6.2	2
Primary anterior tooth root canal obturation	5.2; 6.2	2
Zirconium pedodontic crown	5.1; 6.1; 5.2; 6.2	4
Retroalveolar radiography pre- and post-surgery	2	1
Upper lip frenectomy		1
Medically-assisted intravenous analgo-sedation – I.C.U	150 min/2 h 30 min	
Professional brushing + Local fluoridation		1

Patient No, 5: 3-year-old
Pathological conditions: Respiratory conditions, Drug allergies, Anemia

Table 5. Patient No. 5

Treatment	Tooth	Element no.
Primary posterior tooth pulpectomy	8.5	1
Primary posterior tooth root canal obturation	8.5	1
Zirconium pedodontic crown	7.5; 8.5	2
Retroalveolar radiography pre- and post-surgery	2	3
Primary posterior tooth Dycal indirect capping	5.5; 5.4; 6.4; 6.5; 7.4; 8.4	6
Primary posterior tooth Equia Forte obturation	5.5; 5.4; 6.4; 6.5; 7.4; 8.4	6
Primary anterior tooth Equa Forte obturation	5.3; 5.2; 5.1; 6.3	4
Upper lip frenectomy		1
Medically-assisted intravenous analgo-sedation – I.C.U	180 min/3 h	
Professional brushing + Local fluoridation		1

Patient No. 6: 2-year-old
Pathological conditions: Respiratory conditions, Anemia

Table 6. Patient No. 6

Treatment	Tooth	Element no.
Ultraseal XT hydro widened sealing	5.1; 5.2; 6.1; 6.2	4
Primary anterior tooth root canal obturation	5.1; 6.1; 5.2; 6.2	4
Zirconium pedodontic crown	5.1; 6.1; 5.2; 6.2	4
Medically-assisted intravenous analgo-sedation – I.C.U	150 min/2h 30 min	

Patient No. 7: 12-year-old
Pathological conditions: Mental retardation

Table 7. Patient No. 7

Treatment	Tooth	Element no.
Primary anterior tooth pulpectomy	5.2; 6.2	2
Primary anterior tooth root canal obturation	5.2; 6.2	2
Zirconium pedodontic crown primary tooth	5.1; 6.1; 5.2; 6.2	4
Retroalveolar radiography pre- and post-surgery	2	1
Upper lip frenectomy		1
Medically-assisted intravenous analgo-sedation – I.C.U	150 min/2 h 30 min	

Professional brushing + Local fluoridation		1
Extraction	4.5; 3.6	2

Patient No. 8: 10-year-old
Pathological conditions: Mental retardation

Table 8. Patient No. 8

Treatment 1	**Tooth**	**Element no.**
Pulpectomy, drug treatment, temporary obturation	1.3; 1.1; 1.2; 2.1; 2.2; 3.6	6
Primary tooth extraction	8.4	1
Permanent tooth extraction	2.6; 4.6	2
Medically-assisted intravenous analgo-sedation – I.C.U	180 min/3 h	

Treatment 2	**Tooth**	**Element no.**
Gutta-percha root canal obturation + temporary obturation	1.3; 1.1; 1.2; 2.1; 2.2; 3.6	6
Physiognomic obturation with diacrylic composite resin	1.3	1
Medically-assisted intravenous analgo-sedation – I.C.U	180 min/3h	

Treatment 3	**Tooth**	**Element no.**
Crown-root reconstruction with fiberglass	1.2; 1.1; 2.1; 2.2	4
Crown reconstruction with diacrylic composite resin	1.2; 1.1; 2.1; 2.2	4
Preventive obturation	3.5; 3.4; 4.4; 4.5	4
Glass ionomer cement obturation	1.6; 1.4; 2.4	2
Medically-assisted intravenous analgo-sedation – I.C.U	210/3h and 30 min	

CONCLUSIONS

Ambulatory general anesthesia is an essential adjuvant for the performance of dental works in children with disabilities, who are unable to accept routine dental care. With the help of ambulatory general anesthesia, it is possible to perform dental procedures such as dental reconstructions as well as extractions, within a reasonable time period. The performance of such procedures provides the advantages of a non-traumatic emotional experience, a lower risk of infection, and lower cost. The monitoring of such children over time, postoperative complications, as well as the need for repeated treatments, can be achieved with the help of ambulatory general anesthesia. Ambulatory general anesthesia may be performed on a variety of patients with minimum medical comorbidities. The general anesthesia techniques are safe and are an effective path

The majority of the dental procedures under general anesthesia were performed within a time period identical to that normally required for such procedures. The assessment of factors with impact on the duration of general anesthesia can increase efficiency for pediatric dental procedures. The main factors that influence the surgery time duration were: the ASA patient classification; the type of dental treatment; the number of teeth treated. Dental pain post-treatment is one of the most common and lasting of the symptoms. Pain control contributed to a decrease in post-anesthetic complications in dental treatments.

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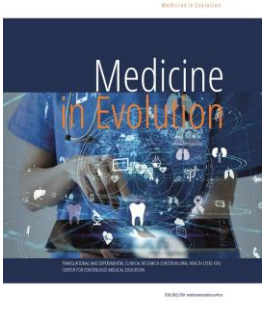
Improving the aesthetic and functional appearance of a 4-year-old patient using a removable space maintainer – case report



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Abstract

A case of a 4-year-old male patient with a history of trauma in the anterior area, is presented after he received an aesthetic removable space maintainer. The removable space maintainer manages to restore the aesthetic, phonatory, masticatory function, preventing the installation of parafunctional oral habits and social stigma.

Keywords: aesthetics, space maintainer, paediatric patient

INTRODUCTION

Premature loss of temporary anterior teeth due to trauma as avulsion, extraction of traumatic injured teeth or teeth affected by accelerated resorption has a prevalence ranging from 5.8-19.4%[1]. The premature loss of primary teeth is a common problem in pediatric dentistry, because it leads to loss of arch integrity and adversely affecting the proper alignment of permanent successors [2].

Hence, space maintainers (SM) are used to maintain the space [3]. The aesthetic removable space maintainer (RSM) is in a way a SM, designed to use as support the nearby primary molars as abutment, with an aesthetic part of artificial incisors. Their application is recommended by paediatric dentists to improve the aesthetics and functional function [4].

There are various advantages to use an RSM [5], including preserving the proximal lengths of spaces, while maintaining the vertical height therefore restoring the aesthetics of the teeth [6], preventing speech disorders [7], and eliminating habits such as thumb or lip sucking, unilateral chewing. The manufacture of RSMs is complicated, because requires experienced technicians. Thus, the shortage of artificial deciduous teeth, artificial permanent teeth are usually modified to reproduce the functionality of deciduous teeth. In most of the time, they do not accurately simulate their morphology.

Tooth loss can also affect the child's speech and aesthetics when they tend to cover and hide the missing teeth, behavior that can lead to a restricted lip and jaw movement, while speaking. An anterior edentulous space can cause a maladaptive articulatory habit or may initiate a tongue thrust pattern [8].

Aim and objectives

The purpose of this study is to evaluate the performance of a modified removable SM. The prosthodontic rehabilitation of an anterior teeth loss requires important consideration in order to restore aesthetics and function. This case report describes a case of a 4-year-old patient who lost teeth 5.1, 5.2, 6.1, 6.2 where a removable functional space maintainer was used to rehabilitate the lost functions.

MATERIALS AND METHODS

Patient Case Selection

Early loss of frontal primary teeth, where the paediatric patient requires a functional SM.

Case Description

A 4-year-old male patient presented to the Department of Pediatric Dentistry, with a chief complaint of front region early loss of teeth 5.2, 5.1, 6.1, 6.2 due to a traumatic event 3 months ago (Fig 1). On clinical and radiographic examination (Fig. 2), the absence of the four incisors was confirmed and the decision to place an aesthetic functional SM was taken.

Figure 1. Anterior edentulous space

Figure 2. Radiographic examination

The aesthetic removable space maintainer was fabricated by the orthodontic dental technician with the following components: framework from cold cured acrylic, median jackscrew, lateral clasps and artificial teeth. (Fig 3).

Figure 3. Clinical appearance after aesthetic removable SM

Design and Fabrication

- Upper and lower impressions were taken. The occlusion was determined on the cast. Artificial teeth were trimmed to an appropriate size and then placed on the edentulous area at the correct occlusion.
- The wire served to provide retention to the appliance on the abutment primary molars

- The base palate was formed of cold-cure acrylic resin to cover the palatal surface (Fig.4).

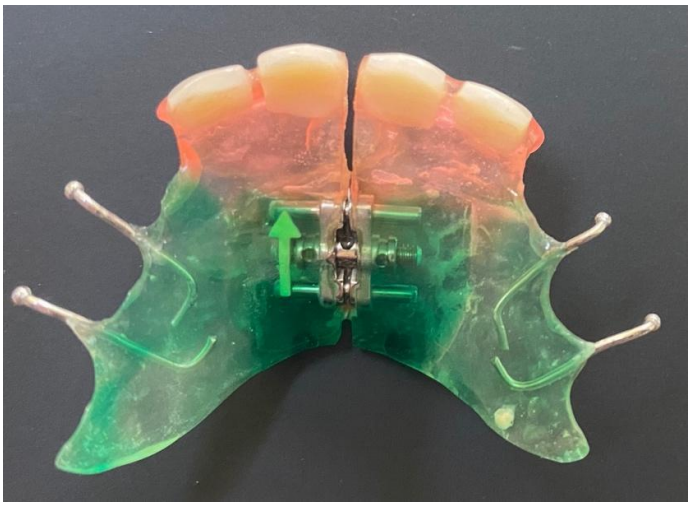

Figure 4. Aesthetic removable space maintainer

DISCUSSIONS

As paediatric patients are usually anxious, their extent of cooperation is limited. Therefore, this will lead to a challenging situation for the restoration of badly decayed primary teeth [9]. The space will close in the first 6 months after tooth removal in the lateral area and it is best to place the SM immediately, in the anterior area no space loss appears but the aesthetics is disrupted. Permanent teeth usually require 4-5 months to progress through 1mm of bone [10]. According to a study the loss of space can take place by both mesial and distal movement of the adjacent teeth [11]. However no single case is related about the choice of SMs, thus the type of removable functional SM is ruled by the presenting clinical scenario [12]. An ideal appliance should be easily reproductible, restoring as much of the natural function of the tooth. The material should be affordable and have the longevity to secure till required. Also the appliance should not interfere with the normal eruption process [13].

A removable SM is easier to clean than a fixed SM, allowing a better preservation of oral hygiene and may be used at the will of patient. Contrary, a fixed appliance is less susceptible to cause injury to the oral tissues and are used continuously for a longer period [14]. In some cases, obtaining retention is difficult as none of the permanent teeth have erupted or are in various stages of eruption. The current modification of SM was found to accomplish all the criteria. The appliance was easy to fabricate depending on the needs of each patient. Some removable SM sometime requires clap adjustment and even some acrylic modification to maintain good retention and allow eruption of the underlying permanent teeth. Most of the fixed appliances only serve to maintain the arch length. The present design helps restoring not only the missing teeth, aesthetics but also the function. The retention of this appliance is easy to obtain, and the small children are quite compliant in wearing it all the time. The major issue its relations to growth. In the follow-up visits, it was seen that the SM did not suppress growth and kept on fitting whenever there was any change in the dentition [14,15].

Supervision and periodic follow-up visits at 3, 6 and 12 months showed that the modified removable SM had no undesirable effect on the growth, hence to the jackscrew activated every 2 months.

CONCLUSIONS

The present design of the aesthetic removable SM is simple and easy to fabricate. It requires less chairside time and as a consequence it increase the compliance of the paediatric patient. It does not supress the growth and it is a suitable appliance for maintaining the aesthetics as well as function.

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Digital workflow of immediate CAD/CAM restoration with hybrid ceramic resins, an aesthetic treatment approach for pediatric patients

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Abstract

Preserving primary teeth is crucial for ensuring the right circumstances for the eruption of their permanent successors. Prosthetic treatment can be the only option for restoring the function, aesthetics and longevity of endodontically treated primary teeth as well as, fractured teeth, multi surface caries or extensive wear. The case report below presents the complete digital workflow and clinical use of a CAD/CAM resin nano ceramic restoration of two endodontically treated primary second molars on a six-year-old patient.

Keywords: CAD/CAM, deciduous teeth, digital impression

INTRODUCTION

Loss of tooth structure may be caused by a number of factors which can include carious lesions due to poor oral hygiene, traumatic injuries or non-carious lesions such as erosion and abrasion (1,2). Excluding traumatic injuries which can lead to an immediate opening of the pulpal chamber, both carious and non-carious lesions if left untreated, will eventually lead to pulpal lesions. In extreme cases, due to severe enamel and dentin loss, teeth may become untreatable leading to extraction (3,4).

Preserving primary teeth is crucial for ensuring the right circumstances for the eruption of their permanent homologues. Premature loss of primary teeth, when left untreated, usually evolves to a space deficit with various consequences on the position and eruption time of the permanent teeth (5-7). In the early stages, the loss of tooth structure can be treated using conventional restorations such as compomers, glass ionomers or even composite resins (8,9). However, in cases of extensive tooth structure loss these restorations may not provide sufficient strength; additionally, primary teeth with endodontic treatment become more brittle, therefore other treatments are required such as coverage crowns (10,11).

Prosthetic treatment can be the only option for preserving and/or restoring the function, aesthetics and longevity of endodontically treated primary teeth as well as, fractured teeth, multi surface caries or extensive wear (12). Over the years, the materials used for the fabrication of pediatric crowns varied from stainless steel (with increased durability but poor aesthetics) to prefabricated zirconia crowns with good aesthetics but impossible to adjust (13,14). The main disadvantage of prefabricated pediatric crowns is the lack of marginal, occlusal and internal fit which can lead to microleakage, wear of the antagonists, consequence of abrasion (improper polishing of occlusal surface) and descementation (15,16).

The use of CAD/CAM technologies in the field of prosthetic dentistry has revolutionized the approach of teeth rehabilitation regarding the accuracy, speed, the patient's comfort and predictability of the treatments (17). Conventional impression methods are difficult to implement even on adult patients, therefore in the case of children, conventional prosthodontics steps may be considered as an impossible task. However, with the CAD/CAM technologies, this may be an issue of the past. Digital impressions take less time to complete and also remove the taste and sensation of the conventional impression materials. The main advantage of these technologies are the high accuracy of the prosthetic milled restorations in regards to all clinical parameters (18,19).

Aim and objectives

The aim of this paper was to present a complete digital workflow and the clinical use of a CAD/CAM resin nano ceramic restoration of two endodontically treated primary second molars on a young growing patient.

CASE REPORT

A 6-year-old male patient presented at the Department of Pedodontics, Faculty of Dentistry, University of Medicine and Pharmacy "Victor Babes", Timisoara, with chief complain of pain in 7.4. The patient's medical history indicated that two weeks earlier he had received a root canal treatment on 7.4 at his local dentist but his mother wanted a second opinion of a pediatric dentist. Clinical examination showed deep dentinal caries on 5.5, 5.4, 6.4, 6.5, 2.6, 3.6, 7.5, 7.4, 8.4, 8.5, 4.6 associated with anterior crossbite.


a)


b)


c)

Figure 1. Intraoral clinical exam: a) upper arch; b) lower arch; c) frontal view of occlusion

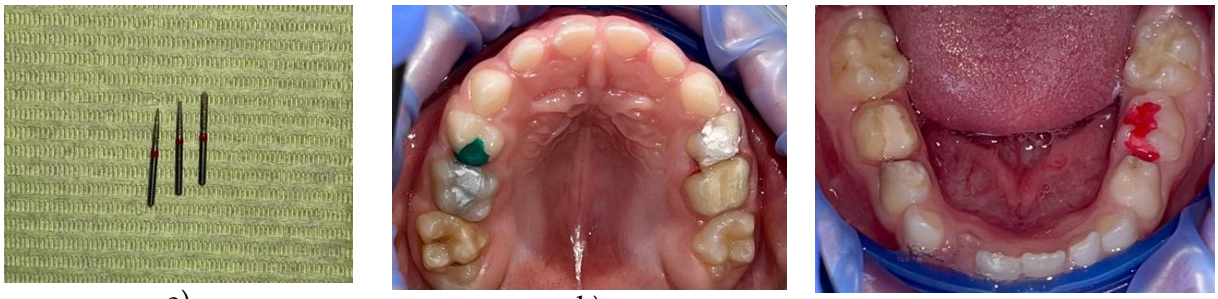
Radiographic examination showed loss of tooth structure on the before mentioned teeth. Additionally, deep caries with pulp damage was shown on 7.5 and on the first quadrant, on 5.5 and 5.4.

Figure 2. Orthopantomography

Pulpectomy was performed as described below. Inferior alveolar nerve block was administered (2% lidocaine with 1:100.000 adrenaline), the tooth was isolated with a rubber dam, the pulp chamber was accessed, and the working length was determined using a Size 15 sterile K-file to 2 mm short of the radiographic apex. Intracanal tissue was extirpated using a barbed broach (Medin Barbed Broach, Vlachovice, Czech Republic), and the canals were filed with Vitapex. Canals were irrigated with 2% Gluco-Chex between instruments and with 5 ml of sterile saline as a final irrigation. Canals were dried with premeasured paper points up to 2 mm from the root apices. Canals were filled with Vitapex a premixed calcium hydroxide with iodoform solution using a endodontic intercanal tip. After radiographic control of the root-canal filling, a cotton pellet was applied to the pulp chamber, and the access cavity was sealed with glass ionomer cement (GC Equia Forte HT FIL capsules).

Due to extensive tooth structure loss on both 5.5 and 7.5, a digital prosthodontic treatment approach was chosen in order to ensure the protection of the teeth and to restore the aesthetic and function. Approval and written consent was obtained for the CAD/CAM treatment.

The treatment involved the preparation of the deciduous teeth 5.5 and 7.5 according to standardized preparation techniques: 1.2 mm of occlusal reduction, 1 mm of axial reduction and a chamfer finish line positioned equigingivally.

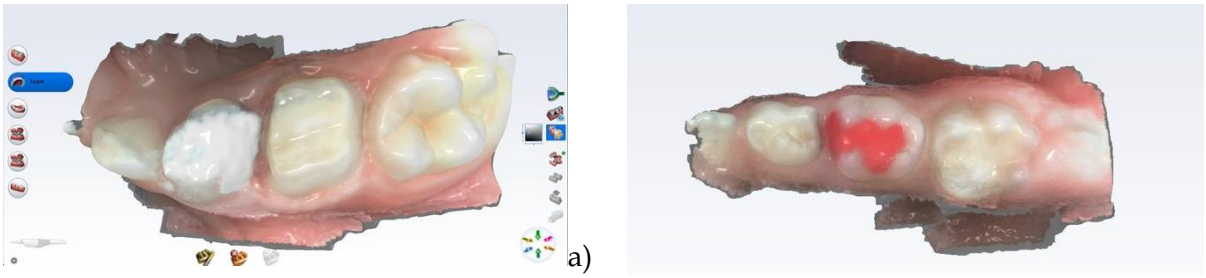


a) b) c)

Figure 3. dental burs used, b) intraoral aspect of the preparation of 5.5, c) preparation of 7.5

Both abutments were scanned using an intraoral scanner (Planmeca Planscan, Finland), obtaining the digital models.

Figure 4. Digital impression



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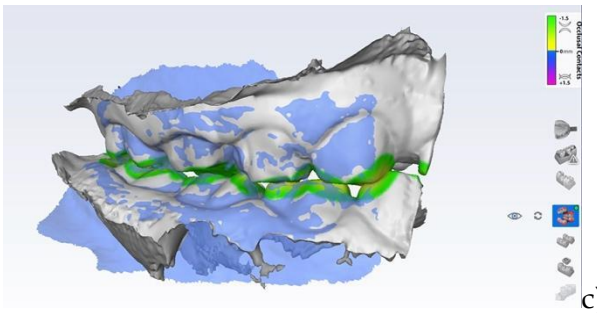
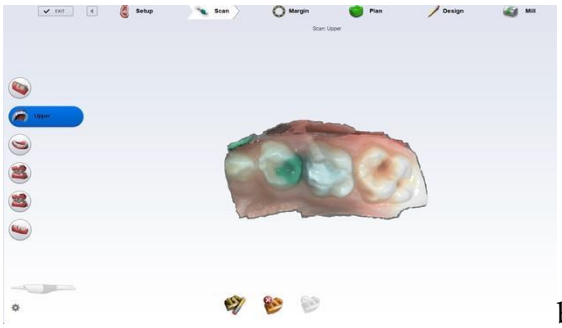

c)

d)

Figure 5. dental scanning - a) 5.5 scanned abutment, b) lower antagonist, c) occlusion, d) tooth preparation margin line

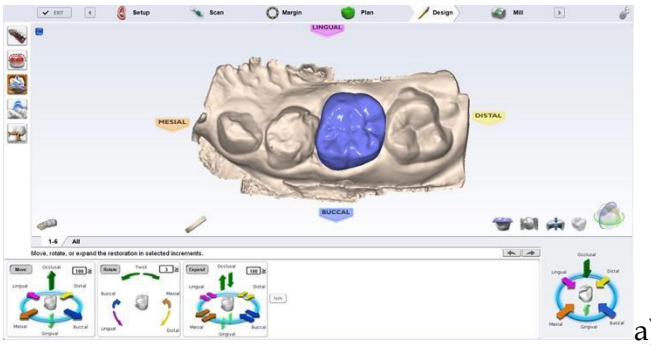

a)


b)

c)

Figure 6. dental scanning – a) 7.5 scanned abutment, b) lower antagonist, c) preparation margin line

The next steps included the design of the crowns (Romexis Software) followed by the milling of the final restorations from hybrid ceramic resin blocks (Tetric CAD, Zurich).



a)

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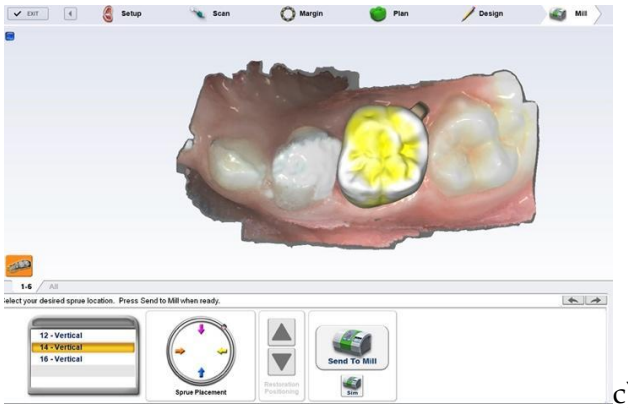
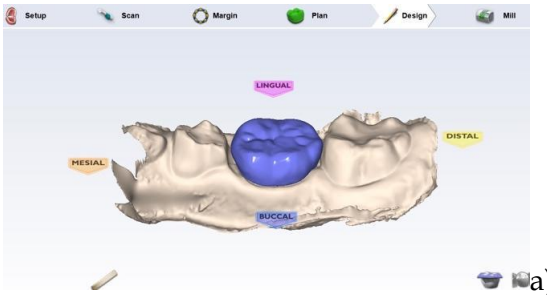


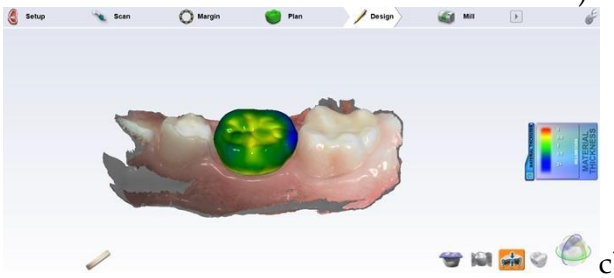
c)

Figure 7. a,b) establishing the dental crown design, c) default crown milling parameters



a)

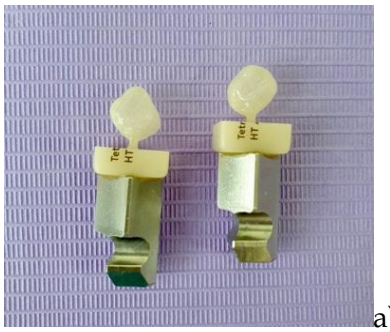
b)

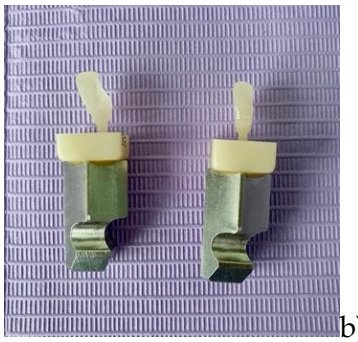


c)

d)

Figure 8. a,b) establishing the dental crown design, c) setting up the material thickness, d) default crown milling parameters


a)


b)


c)


d)

Figure 9. a,b,c) Tetric CAD hybrid ceramic resin crowns, d) final restorations

After the milling procedure, the restorations were assessed intraorally for marginal and internal fit. Teflon strips were placed on the adjacent teeth to prevent any excess cement from bonding to them. Adhesive cementation protocol was implemented: etching with orthofosforic acid (37%), bonding (Adhese Universal) and light curing. Next, the crowns were filled with cement (Variolink Esthetic DC) and seated on the abutments.

Figure 10. Adhesive cementation protocol

All excess cement was removed after an initial 2 seconds polymerization followed by final light curing of the cement. Last step involved the occlusal adjustments and polishing of the crowns.

a)

b)

Figure 11. a,b) Final aspect of fixed prosthodontic restorations

DISCUSSIONS

The prevalence of endodontically treated primary teeth associated with extensive tooth structure loss is a common situation in the field of pediatric dentistry. Depending on the extension of the tooth destruction, conventional conservative methods (compomers, glass ionomers) may not provide viable treatment options, leading to a complete coronal loss and eventually the premature extraction of the primary teeth with negative consequences on the evolution of the permanent homologues (20).

Preformed stainless-steel crowns were frequently used in the management of severely destroyed primary teeth due to their cheap fabrication process and fast clinical procedure of adjustment and cementation. However, stainless steel crowns come with a number of disadvantages including improper marginal adaptation (with negative impact on the adjacent gingival tissue), lack of aesthetics and also the potential allergenic reactions caused by low biocompatibility (21,22). As a biocompatible and aesthetic alternative, prefabricated zirconia

crowns were introduced, providing superior aesthetics but at the cost of increased tooth reduction and less possibilities for marginal adaptation (23).

CAD/CAM technologies provide both requirements of aesthetics (ceramics, resin ceramics) and clinical fit eliminating at the same time the disadvantages of conventional prosthodontics generated by the impression procedure. Another advantage provided by these technologies is the real time evaluation of the abutment geometry, therefore any adjustments can be performed during the digital impression procedure without the need of an additional appointment. Additionally, the same day milling of the final prosthetic restoration is another advantage that promotes the use of CAD/CAM technology in the field of pediatric dentistry (18).

This case report presents the workflow in the fabrication of two CAD/CAM nanoceramic crowns for the rehabilitation of endodontically treated primary molars. When compared to other treatment options such as preformed crowns, the digital approach may be more time consuming, more expensive for both the clinician and the patient and also the cementation procedure is more sensitive. However, the advantages that these systems provide regarding the precise fit, marginal adaptation and excellent aesthetics, combined with the same day milling of the final restorations far outweigh the presented disadvantages.

CONCLUSIONS

In regards to the present case report, the following conclusions can be drawn:

- CAD/CAM technologies provide and ideal alternative to conventional treatment approaches implemented in pediatric dentistry;
- When compared to preformed crowns, CAD/CAM fabricated crowns provide excellent clinical results of internal, and marginal fit and occlusal adaptation;
- In case of long-term functionality of primary teeth, CAD/CAM restorations may be the best alternative treatment;

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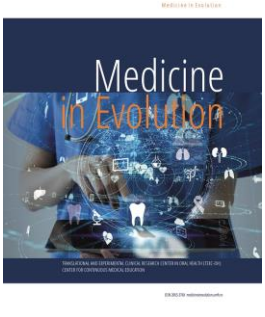
Direct restoration in esthetic rehabilition following traumatic injury



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Abstract

Aim and objectives: The purpose of this work is to present a clinical case with a non-complicated coronal-fracture of permanent upper incisor. To restore the tooth we chose the stratification technique using the silicon key.

Material and methods: A 8-year-old male pacient was referred by his mother to the dental clinic of our medical care center, reporting a dental trauma consisting of a coronal wide fracture of more than the incisal third of 2.1. The clinical and radiographic examination revealed that the injury has caused a non-complicated crown fracture

Results: Composite resin restoration for the restoration of permanent incisors that have minimum or not very extensive crown fractures is an excellent approach due to a conservative, timely, and economical treatment option

Conclusions: Direct restoration using the stratification technique and the silicon key can help each dental practicer to achieve clinical success if handled properly and with the proper materials.

Keywords: dental trauma, proportion, central, silicon key

INTRODUCTION

Dental trauma (DTI) is an impact injury to the teeth and/or other hard and soft tissues in and around the mouth and oral cavity [1]. The incidence of dental trauma affects about 5% of the population on a global scale, and the prevalence shows a wide range from 6% to 59% with a large variation depending on the geographical area [3]. The traumatic injuries in children and adolescents are a common problem, and some reports have been observed that its prevalence has increased in recent decades [5-7]. In permanent dentition, the coronal fractures are a common occurrence, particulary in children between 8 and 11 years old [6-7]. The most common reason for these types of injuries area accidents and sports activities [8]. Many studies have shown that males suffer trauma more frequently (1.3-2.5 times) than females in permanent dentition, probably due to a greater propensity for contact sports, violent behaviour, and a lower maturity than females [4]. Age is another risk factor. Studies indicate that dental trauma is more common in younger population (toddlers, children, adolescents, and young adults) due to increased physical and sporting activity [4]. Everytime the anterior region is involved, it is important to satisfy esthetic requirements, since a delightful smile looks to play a key psychosocial role in young adults life and relationships.[9] When selecting the type of treatment, some clinical aspects are key to be considered, like the quality of the remaining tooth structure, location of the fracture line, age of the pacient, and the presence of parafunctional habits.[10-11] Restoring teeth in the esthetic region may represent a challenge; however, adhesive materials and ceramic restorations may present a healthful solution, because they offer minimally invasive properties and excellent esthetic appearances.[12] Regarding direct or indirect restorations, the clinician must choose which of the two methods to use, which of those fits the case better and will lead to the best results. In literature, there are no precise guidelines regarding this choice. Composites, infiltrating resins, ceramics, layering techniques, and CAD-CAM techniques can simplify the therapy and make it predictable. [13-14]

Aim and objectives

The purpose of this work is to present a clinical case of a 8 year old child with a non-complicated coronal-fracture of permanent upper incisor. The following article will present the treatment method chosen, more specific, direct restoration using wax-up technique, details regarding the method and materials used in the process, aswell as the final aspect and how well this technique can be applied in those kind of cases, restoring functionality, phonation and most important, esthetic aspect of the pacient.

MATERIALS AND METHODS

A 8-year-old male pacient was referred by his mother to the dental clinic of our medical care center, reporting a dental trauma consisting of a coronal wide fracture of more than the incisal third of the permanent central maxillary incisor of the second quadrant. Dental history revealed that he suffered an injury after falling while playing. The tooth fragment was never recovered and has been declared lost. There were no previous treatments reported by pacient since the accident.

The clinical and radiographic examination revealed that the injury has caused a non-complicated crown fracture of more than the incisal third of the tooth 2.1, without pulp exposure, integrated in the Ellis and Davey's Classification as class 2 (Extensive fracture of the crown involving enamel and dentin). The examination revealed crown fracture with no further symptoms, no mobility and no root fractures. First choice was to test the tooth's

vitality, using a cotton ball and an ice spray to see if the pulp responds to termical provocation. During the procedure, not only 2.1 was tested, but also 1.1, so that the pacient can see how a healthy tooth reacts and so that he can make a significant difference if needed. At first, no reaction was noted, but the second time it was noticed by the pacient and related as positive, therefore no endodontic intervention was required.

Given the position and pattern of the fracture, the direct restoration using the silicon key technique seemed to be a realiable option for treatment.

The first stage of the restoration procedure is to take an impression of the maxillary arch in order to do a gypsum model for the wax-up (Figure 1,2). After the tooth's wax-up, a silicone key is realised, necessary for the direct reconstruction of the fractured element, using the stratification technique (Figure 3).

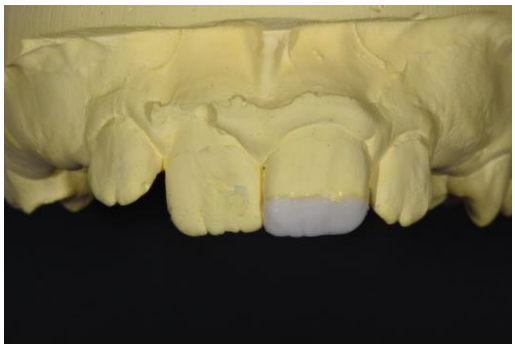

Figure 1. Frontal view of the wax-up restoration of the tooth

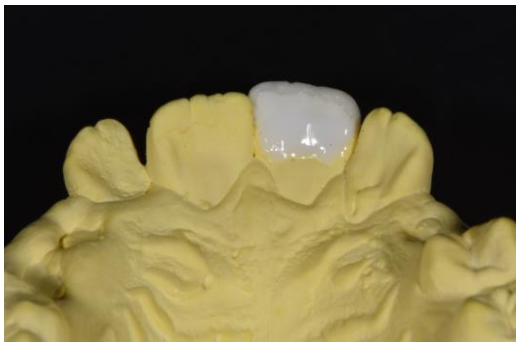

Figure 2. Palatal view of the wax-up restoration of the tooth

Figure 3. Silicon key adapted on the frontal teeth and view of the fracture

Figure 4. Color determination via Vita EasyShade

Tooth colour is determined via Vita EasyShade in 3-points determination, resulting A2 (Figure 4).

No anestesia or inhalation sedation was necessary for this case.

Next step consisting of Rubber Dam isolation, that is essential and mandatory, wide extended from temporary molar to temporary molar for anterior area. Following this step, we check the adaptability of the silicon key.

A functional bevel in an angle of 45 degrees on the vestibulary surface is created in order to camouflage the transition area between restoration and enamel and then isolation of the neighboring teeth with Teflon tape is realised.

It then proceeds with the conventional steps of etching using BlueEtch 37% - 30 seconds on the enamel, then rinse and dry and using a self-etch bonding for dentin, followed only by polimerisations (Figure 5).

Figure 5. Isolation with teflon tape of the neighboring teeth and appliance of ScotchBond Universal Plus on the etched sufaces

Once the silicon key is positioned, reconstruction begins on the palatal surface, the first increment being realised out of A2 E composite, solidified by light-curing, resulting the supportive wall on which we can proceed with the reconstruction using stratification technique (Figure 6).

Figure 6. The palatal support wall created out of flowable composite

It then continues with realising both proximal walls using A2 enamel composite – applying again the stratification technique and light-curing of each layer throughout the procedure.

We go further on with the stratification of the dentin using A2 dentin and following the morphology of its counterpart tooth, followed again by light-curing (Figure 7).

Figure 7. Restoration of the fractured element using stratification technique

The last surface to restore is the vestibulary surface, using A2 enamel, also layer after layer using the same technique as before. At this point of the procedure, the tooth is fully restored out of composite.

We move on to finishing the obtained restoration, but before that, we should keep in mind that the palatal surface was restored out of A2E composite on the silicon key and therefore, it will suffer no finishing or modification. For this step, there were used multiple tools, such as diamond cutters for finishing, Arkansas stones, abrasive metal bands. First we use the diamond cutter (code red-tappered cutter) to regulate the surfaces of all big irregularities, followed up by Arkansas stones for finer detailing and then using the abrasive bands for interproximal finishing of the restoration.

Polishing the restoration is also very important and represents the final stage of this treatment. For this step there were used gums, of different abrasivity grade, from white to green and pink color, following this order from most abrasive to least abrasive. After those type of gums, there were used 3M Sof-Lex Diamond polishing spiral as the last piece of intervention regarding the restoration procedure.

Rubber dam isolation was then removed and the occlusion was checked with articulation paper to remove any interference points, but none were discovered (Figure 8).

Figure 8. Final aspect of the tooth after finishing and polishing

RESULTS

In case of anterior teeth fracture as a result of a trauma, it is possible to use direct techniques to restore the correct morphology of the teeth concerned to restore the correct morphology of the teeth.

Composite resin restoration for the restoration of permanent incisors that have minimum or not very extensive crown fractures is an excellent approach due to a conservative, timely, and economical treatment option

The symmetry could not be remade, due to the positioning of the centrals.

The golden proportion of the central was closely respected.

DISCUSSIONS

The preservation of the fragment is not always possible, because the circumstances in which the fractures occur, sometimes does not allow the patient to find it, which guides the treatment for a reconstruction with composite resin. Composite resin restoration for the restoration of permanent incisors that have minimum or not very extensive crown fractures is an excellent approach due to a conservative, timely, and economical treatment option. [15-20] Among the advantages of direct techniques, it is known that they have a few endodontic complications, present the possibility of reintervening in the event of a further fracture, and allow immediate restoration of aesthetics in a single appointment. An additional benefit of direct restorations is the preservation of all future treatment options. Compared to indirect techniques, however, they have lower strength, greater surface roughness and polymerization shrinkage [12]. In case of anterior teeth fracture as a result of a trauma, it is possible to use direct and indirect techniques to restore the correct morphology of the teeth concerned. Several choices of materials for both techniques are available. Both techniques have positive and negative aspects that will lead the dentist to make choices. [21]. Composite resins, mainly used in direct procedures, can be indicated for both direct and indirect techniques and their widespread use derives from their acceptable longevity at relatively low costs [22]. The choice of resin composite should be focused on aspects related to the strength and aesthetics. Within this context, the composite layering is the key to obtaining esthetically successful restorations. [17] Resin stratification initiating from the palatal enamel is the best choice, particularly in fractured anterior teeth, with a transparent composite to create the underlying structure for the subsequent layers [17]. The palatal enamel can be constructed with the use of a polyester matrix, pre-fabricated acetate crowns, or personalized guides like silicone matrix [18]. The silicone matrix option has advantages in restorative procedures by providing reduction of the operating time [17], maintenance of the cervico-incisal and mesiodistal dimensions besides appropriate control of the thickness of the resin increment, and enough support for the build-up of material from the palatal aspect [18]. The variation of some characteristics of the composite materials like translucency and opacity of composite resins requires the professional to know the different esthetic restorative materials and their optical behavior and may thus replace or correct color tones during the restorative procedure.[7, 17-20] Several variables can affect the longevity of this type of restoration including the extent of the crown fracture, the restoration size, the occlusion of the restored tooth, and the overall prognosis of the injured tooth.[18] The choice of resin should be focused on aspects related to the strength and aesthetics. The present hybrid resins, due to its high percentage of inorganic filler and diversity of colors for enamel and dentine, allow satisfactory clinical results, in terms of longevity of the restoration.[12]

Regarding the presented case, both aspect and location of the fracture, reinforced by newest generation of materials and knowledge of techniques may have led to clinical success. Limitations of the used adhesive can probably be attributed to detachment of the restored

part of the tooth by a new traumatic injury or color deficiencies for not reproducing the originals tooth color. Although these kind of unpleasantries can happen, the present case was a success reproducing its original color and morphology, but most important, the pacients smile.

CONCLUSIONS

Direct restoration using wax-up and the stratification technique can help each dental practicer to achieve clinical success if handled properly and with the proper materials. It represents a realitve easy technique that saves time for the practicer and reduces the costs of treatment for the pacient. It is very important to achieve a exemplary work, as soon as possible for re-establishing the pacients functionality, phonation and esthetic aspect, as to also diminue the psycho-social impact on the affected pacient.

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INSTRUCTIONS FOR AUTHORS

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

Manuscripts will not exceed:

- general reviews: 6-8 pages
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The paper will be edited according to international editing rules for manuscripts. The title will be written in capital characters and it will be followed by the name and surname of the author (authors), followed by their place of work (place where the paper has been elaborated). Studies and researches will be followed by a brief abstract, followed by 3-4 key-words.

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

- for articles: name of the authors and surname initials, title of the article in the original language, title of the journal according to the international abreviation system, year of issue, volume, number, pages;
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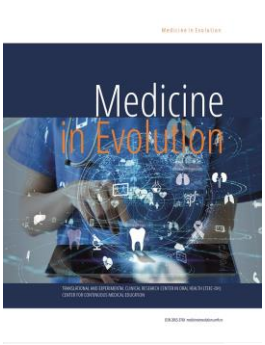

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INTRODUCTION [Book Antiqua, 11, bold, left alignment]

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

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

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

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

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

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

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

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

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

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

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6.2. CONTENT OF THE PAPER - INDICATIONS FOR CASE REPORTS

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

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

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

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

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

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

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