CORRELATION BETWEEN PSYHOACTIVE SUBSTANCE ABUSE AND PERIODONTAL ALTERATION

Hadžić S.*[1], Gojkov-Vukelić M.[1], Pašić E.[1], Šečić S.[2]

[1] Department of Oral Medicine and Periodontology, Faculty of Dentistry, University of Sarajevo, Sarajevo, Bosnia and Herzegovina
[2] Department of Oral Surgery and Dental Implantology, Faculty of Dentistry, University of Sarajevo, Sarajevo, Bosnia and Herzegovina

***Corresponding author**

Sanja Hadžić, PhD
Faculty of Dentistry,
University of Sarajevo
Bolnička 4a, 71000 Sarajevo
Bosnia and Herzegovina
Phone: +387 33 210 683
e-mail : shadzic@sf.unsa.ba

ABSTRACT

Introduction: The World Health Organization has defined drugs or psychoactive substances as all substances of natural or synthetic origin which, when introduced into the organism, may alter one or many various bodily functions, and which, after repeated use, may lead to development of a mental or physical addiction. In oral cavities of drug addicts, drug addiction may induce direct or indirectly caused alterations. Incidence of periodontal diseases is higher among drug addicts than among those who do not consume psychoactive substances.

Objective: Evaluate the effect of psychoactive substances among persons with alcohol and opiate addiction on the level of oral hygiene and periodontal alteration.

Materials and Methods: The sample consisted of 60 subjects of both sexes, from 18 to 60 years of age, divided into 2 groups: Group A: subjects addicted to psychoactive substance - alcohol, and Group B: subjects addicted to psychoactive substance - opiates. Following an extensive anamnesis and clinical examination of the mucosa, periodontal examination was performed. Plaque index and gingival bleeding index were used for quantification of periodontium.

Results and Conclusions: Data obtained by clinical examination was statistically processed: oral hygiene, plaque index, gingival index, and presence of gingivitis and periodontitis in psychoactive substance abusers. Statistical analysis confirmed ($p = 0.00397$) a higher incidence of periodontal disease in alcohol-dependent patients (60%), compared to opiate addicts (23%). Regardless of age, type of psychoactive substance, or length of substance abuse, there is a correlation between the abuse of psychoactive substances (drugs) and periodontal alterations.

Key words: psychoactive substances (opiates, alcohol), periodontal diseases, oral hygiene.

Introduction

Dependence on psychoactive substances is currently a leading social and health problem worldwide. The World Health Organization has defined drugs or psychoactive substances as all substances of natural or synthetic origin which, when introduced into the organism, may alter one or many various bodily functions 1, 2.

Drugs are natural or synthetic substances that may cause alterations or disorders of one or more somatic or mental functions, and are used in medical or non-medical purposes. Drugs are divided into hard and soft drugs. Hard drugs cause severe mental and physical dependence (heroin, cocaine). Soft drugs have a moderate potential for psychological dependence, and a small risk of physical dependence. These include alcohol, amphetamines, nicotine, hallucinogens, caffeine, marijuana (hashish), organic solvents, and others 3, 4.

Psychoactive substance can enter a body in several ways: orally (alcohol, tablets), by smoking, inhalation (marijuana, cocaine, opium), sniffing (cocaine, heroin), subcutaneously, and intravenously (heroin, cocaine). Psychoactive substances (drugs) have a major impact on oral health. Oral alterations depend on the type of drug. Incidence of caries, periodontal diseases, and fungal infections is higher among drug addicts than among those who do not consume psychoactive substances.

Alterations in the oral mucosa are not pathognomonic for those addicted to psychoactive substances, but the following may be observed: Cheilitis angularis, Candidiasa mucosae oris, Glossitis rhombica mediana, Gingivostomatitis ulceromembranacea, Gingivitis catharalis, Linear gingival erythema, Parodontitis agresiva, Lingua nigra villosa, Leukoplakia, Hyperceratisis mucousae oris, Stomatitis aphthosis recurrens (SAR), Erosiae mucosae oris, Herpes simplex, Morsicatio mucosae oris, caries, bruxism, and other 5, 6. In patients addicted to psychoactive substances (alcohol, opiates), immunosuppression of the immune system is observed, giving rise to an increased incidence of opportunistic infections. Patients who use methamphetamine display the so-called "Meth mouth", characterized by: poor oral hygiene, xerostomia, caries, gingivitis, and aggressive periodontitis (AGP) 7.

Research done by many authors points to the interdependence between psychoactive substance (drugs) intake, length of addiction, and types of drugs, and poor motivation for oral hygiene and periodontal disease. Mc Grath, *et al.* (2005) examined the influence of amphetamines on oral health, and the most common diseases they recorded were: rapid caries, reminiscent of nursing caries, decaying tooth surface, aggressive periodontitis, and oral candidiasis, probably caused by xerostomia, toxic effects of drugs, and poor oral hygiene.

Angular cheilitis, oral candidiasis, and gingival lacerations are often observed in cocaine addicts (Brunnswich 2005), while patients addicted to alcohol more frequently display severe periodontitis 8, 9. Numerous oral, periodontal, and dental diseases occur with an increased incidence in the group of psychoactive substance abusers. Periodontal diseases can be an initial or secondary symptom of AIDS; hence, the importance of symptomatology is preventive and therapeutic 10.

Aim of this research is to evaluate the effect of psychoactive substances among persons with alcohol and opiate addiction on the level of oral hygiene and periodontal alteration.

Materials and methods

The study included 60 patients who were hospitalized at the Institute for Alcoholism and Substance Abuse of Canton Sarajevo, who have provided their consent to participate in this research. They are divided into two groups: Group A – alcohol addicts, and Group B - opiate addicts; both sexes were included and the participants were 18 to 60 years of age (**Figure 1,2**).

Extensive anamnesis was carried out prior to clinical examination. All anamnestic data and observed pathological alterations were noted in a working chart specifically designed for the purpose of this study. The chart records data on the types of psychoactive substance used by the patient, commencement of substance intake, and duration of addiction. Clinical examination included an extraoral (assessment of exterior appearance, constitution, examination of the head and neck), and intraoral examination (examination of the labial mucosa, cheeks, palate, tongue, floor of the mouth, periodontium, and teeth) (**Figures 3, 4, 5, 6, 7, 8**).

Figure 1.
Alcohol addict with carious teeth, plaque, and periodontitis

Figure 2.
Opiate addict with decayed crowns, carious teeth, and periodontitis

Figure 3.
Examination of the lips

Figure 4.
Examination of the tongue

Figure 5.
Examination of the buccal mucosa

Figure 6.
Caries profunda, gingivitis catarrhalis

Figure 7.
Linear gingival erythema

Figure 8.
Parodontitis agressiva

Periodontium is a functional organ composed of gingiva, periodontal ligament, alveolar bone, and cementum. Gingiva is the only visible part of periodontium. During the clinical examination of the gingiva, we observed its size, shape, colour, and consistency. We used the Pitting-test (verification of oedema or gingival hyperplasia) to estimate the size of the gingiva.

The following indices were used for quantification of periodontium:

Plaque index (Silness and Löe)

0: No plaque on tooth, scraping the neck of the tooth produces no plaque on the end of the probe;

1: No plaque on tooth, but scraping the neck of the tooth produces plaque;

2: Plaque is visible on tooth;

3: Tooth contains a lot of plaque;

Plaque index was used to quantify the presence of dental biofilm (plaque) on teeth.

Gingival bleeding index (Löe and Silness)

0: Change in colour, shape, and size of gingiva not observed, no inflammation;

1: Colour of gingiva changed, blunt pressure does not cause bleeding, mild inflammation;

2: Blunt pressure causes gingival bleeding, moderate inflammation;

3: Gingiva bleeding spontaneously, significant erythema, hypertrophy, ulcerations, severe inflammation.

Normal and pathological conditions of the gingiva are quantitatively expressed using gingival index.

Results

The study included 60 patients of both sexes, aged 18-60 years, addicted to alcohol (Group A) and opiates (Group B), with various degrees of periodontal alteration.

State of oral hygiene is a reflection of the general habits of psychoactive substance abusers to tooth brushing.

Table 1 shows the frequency (percentage) of tooth brushing in examined groups, and in total.

Chi-square test ($p = 0.0021$) has confirmed that there are significant differences in the frequency of tooth brushing in groups. In Group A, 12 patients (40.00%) do not brush their teeth, while of 24 patients (80.00%) in Group B brush their teeth once or twice a day.

Table 2 shows the frequency (percentage) of plaque index in examined groups, and in total.

In Group A, 20 patients had plaque index 2, 8 patients had plaque index 3, and only 1 patient had plaque index 1. In Group B, 18 patients had plaque index 2, 6 patients had plaque index 3, and 6 patients had plaque Index 1. Chi-square test ($p = 0.30256$)

	1 time per day		2 and more times per day		Occasionally		Does not brush	
	n	%	n	%	n	%	n	%
Group A	5	16,67	6	20,00	7	23,33	12	40,00
Group B	5	16,67	19	63,33	4	13,33	2	6,67
Total	10	16,67	25	41,67	11	18,33	14	23,33

Table 1.
Frequency of tooth brushing

Plaque index	Index 1		Index 2		Index 3	
	n	%	n	%	n	%
Group A	2	6,67	20	66,67	8	26,67
Group B	6	20,00	18	60,00	6	20,00
Total	8	13,33	38	63,33	14	23,33

Table 2.
Plaque index frequencies

confirmed that there are no significant differences in frequencies of plaque index in groups. 38 patients (63.33%) had plaque index of 2. In Group A, 20 patients (66.67%) had index 2, while there were 18 such patients (60.00%) in Group B.

Table 3 shows the frequency (percentage) of gingival index in examined groups, and in total.

Chi-square test ($p = 0.68990$) confirmed that there are no significant differences in frequencies of gingival index in groups. 31 patients (51.67%) had gingival index 1. In Group A, 15 patients (50.00%) had index 1, and there were 16 such patients (53.33%) in Group B. Index 2 was determined in 23 patients (38.33%), of which 11 patients (36.67%) in Group A, and 12 patients (40.00%) in Group B.

Plaque index	Index 1		Index 2		Index 3	
	n	%	n	%	n	%
Group A	15	50,00	11	36,67	4	13,33
Group B	16	53,33	12	40,00	2	6,67
Total	31	51,67	23	38,33	6	10,00

Table 3.
Gingival index frequency

Chelitis	None		Plaquosa		Catarrhalis		Hyperplasia		Total
	n	%	n	%	n	%	n	%	
Group A	17	56,67	5	16,67	7	23,33	1	3,33	30
Group B	20	66,67	5	16,67	4	13,33	1	3,33	30
Total	37	61,67	10	16,67	11	18,33	2	3,33	60

Table 4.
Frequency of gingivitis by groups

	Has periodontitis		Does not have periodontitis		Total
	n	%	n	%	
Group A	18	60,00	12	40,00	30
Group B	7	23,33	23	76,67	30
Total	25	41,67	35	58,33	60

Table 5.
Frequency of periodontitis in groups

Table 4 shows the frequency (percentage) of occurrence by type of gingivitis, in groups.

Gingivitis catarrhalis was present in 23.3% of patients in Group A, and 13.3% patients in Group B. Gingivitis plaquosa was recorded in 16.67% of patients in both Group A and B. Chi-square test ($p = 0.78639$) confirmed that there are no significant differences in frequency according to the type of gingivitis in groups. Most common in both groups were gingivitis plaquosa with 10, and catarrhalis with 11 patients. Linear gingival erythema was recorded only in 4 patients (13.33%) from Group B.

Table 5 shows the frequency (percentage) of occurrence of periodontitis in examined groups, and in total.

Chi-square test ($p = 0.00397$) confirmed that there are significant differences in the frequencies of occurrence of periodontitis in groups. In Group A, 18 patients (60.00%) had periodontitis, while there were 7 such patients (23.33%) in Group B. It is evident that the group of alcohol addicts has clinically validated periodontitis at the rate of 60% .

Discussion

Alcohol and opiate abuse is harmful to general and oral health. In recent years, pathological aspect of substance abuse on dental and oral tissues has been the subject of research by many authors because of the increased number of young addicts.

One of the major causes of periodontal disease is low motivation of addicts to maintain good oral hygiene. Patients in our sample, regardless of their age were, not motivated for maintenance of good oral hygiene, particularly the participants in Group A (alcohol addicts). In Group A (alcohol addicts), 12 patients (40%) do not brush their teeth at all, while 24 patients (80%) in Group B (drug addicts) brush their teeth once or twice a day. Supplemental products for oral hygiene are not used by 85% of patients.

Due to poor oral hygiene, patients had a high frequency of plaque and cavities, and had periodontal diseases (gingivitis and periodontitis) due to the

absence of immunological components of salivary and gingival fluid 11.

Psychoactive substances, or drugs, destroy the internal structure of the teeth, and alcohol helps the release of fluoride from certain nutrients thus affecting the lower incidence of caries. In his study, Harris (2010) confirmed that a group of drug addicts had a higher incidence of caries ($p < 0.5$) 1.3 (25) than in the group of alcohol addicts 0.95 (1.7), and that the understanding of the true effect of psychoactive substances on dental health is the subject of further research. In 2007, it was estimated that about 22.3 million Americans aged 12 years were classified as addicted to some type of psychoactive substance 12. Khockh (2009) examined the periodontium of 102 patients (addicts), mean age 41 years, using plaque index and gingival index. The results showed that there is a correlation between the frequency of tooth brushing and plaque levels. Post-hoc analysis showed that in the group of non-alcoholics, those who brushed their teeth once or twice a day had less plaque and fewer cavities 13.

Alcohol addicts have poorer oral hygiene, high plaque index, and prevalence of periodontal diseases, which was confirmed by Araujo (2004), who recorded 47.7% of alcohol addicts and 61.8% of smokers in his sample of 34 patients. Prevalence of dental disease was 82%, and 70% of patients had plaque index 3 14, 15.

Our results are consistent with the results of the aforementioned authors, confirmed by 2 patients (6.7%) in Group A who had plaque index 1, 20 patients (67%) in the same group had plaque index 2, and 8 patients (27%) had plaque index 3. In Group B, 6 patients (20%) had plaque index 1, plaque index 2 was found in 18 patients (60%), and plaque index 3 was observed in 6 patients (20%).

Chi-square test confirmed that there is a statistically significant difference in the occurrence of periodontitis between the groups. In Group A, 18 patients (60%) had clinically recorded periodontitis, compared to Group B, where periodontitis was identified in 7 patients (23%).

Psychoactive substances - in our sample, alcohol and opiates - have had a great influence on the incidence of periodontal disease. By their chemical composition, psychoactive substances have directly influenced the emergence of diseases. Low level of oral hygiene, poor motivation, and lack of and education influenced the increased adherence of plaque, and were correlated with the occurrence of dental diseases 16.

Conclusions

Patients addicted to psychoactive substances are not motivated to maintain oral hygiene. Alcohol addicts do not maintain proper oral hygiene in 40% of cases.

Correlation between substance abuse (alcohol, opiates) and alteration of periodontium (gingivitis and periodontitis) has been confirmed.

A significantly higher incidence of periodontal disease in patients who are addicted to alcohol (60%), compared to patients addicted to opioids has been demonstrated.

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