

Oral health status and oral health behavior of substance abusers in Kerman city, Iran, in year 2016

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Original Article

Abstract

BACKGROUND AND AIM: Drug addiction causes severe oral damage and the socio-economic problems. Prevention and treatment of oral and dental diseases among substance abusers may facilitate their rehabilitation procedure and recovery from drug dependence. The aim of the present study was to evaluate the relationship between drug abuse and oral health status and behavior in drug abusers in Kerman, Iran.

METHODS: This study was carried out on 204 addicts admitted to rehabilitation centers and 197 healthy controls referred to the urban health centers in Kerman City. Multistage random sampling method was applied. Data were collected including demographic data, questions related to oral health behavior, clinical examination for assessment of decayed, missed, and filled teeth (DMFT), Gingival Index (GI), and presence of oral lesions according to World Health Organization (WHO) standards. Data were analyzed using SPSS statistical software. T-test, analysis of variance (ANOVA), and chi-square test were used. $P < 0.050$ was considered as statistical significance.

RESULTS: 193 patients (94.6%) were men and the rest were women with mean age of 37.72 ± 11.89 years. Opium was the most common drug (89.2%). Age of first use of narcotic material in 45.1% was 18-24 years old. Duration of narcotic drugs use in 35.3% was between 6-10 years. There was significant difference between addicted and healthy participants in oral health behavior, oral lesions, and mean scores of GI and DMFT.

CONCLUSION: The results of the present study showed that there was statistically significant difference between addicted and healthy groups in using dental floss, attendance to dentist, having oral lesions, temporomandibular joint (TMJ) problems, and dental hypersensitivity.

KEYWORDS: Drug Abuser; Gingival Index; Oral Health; Oral Disease

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There are 800000-1700000 drug addicts in Iran with a mean age of 32 years, comprising a sizeable proportion of the population. The direct cost of addiction in Iran is approximately \$3 billion, which is almost 15% of the oil revenues.¹

The most commonly-used drugs abused in Iran are opioids. The most common opioids

available in Iran are opium, opium residue, heroin, and codeine, which are abused orally, by inhalation, and intravenously.² Substance abuse causes irreparable damage to the orodental health, apart from its various social and economic implications. In general, the orodental health status in drug abusers and those undergoing treatment with methadone is much poorer than none-drug abusers.

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Recent studies indicate that oral and dental diseases, including dental caries, lost teeth, gingival hemorrhage, and calculus are highly prevalent in heroin addicts and those under treatment with methadone.³ Xerostomia and hyposalivation are very common in these patients, which in turn can give rise to further dental caries.⁴ Drug abuse gives rise to bruxism, tooth hypersensitivity, and necrotizing gingivitis. Shekarchizadeh et al. reported that the majority of subjects who used heroin did not use toothbrush and toothpaste and seldom used dental floss. In addition, more than half of the drug addicts consumed sugary foods 2-3 times a day.⁵

Singh et al. showed that 17% of drug addicts did not brush their teeth regularly. The age of starting drug abuse was 21.0 ± 3.2 years.⁶

Akbari et al. showed that the orodental needs of drug abusers being rehabilitated were extensive and the oral health indexes deteriorated severely with an increase in the duration of drug abuse.⁷ Bhaskar et al. showed that oral health status of substance abusers was poor and a large number of oral mucosal lesions were noted in them.⁸

Poor oral health behavior is shown in Gijwani et al. study in drug addicts in India.⁹

One of the most important burdens inflicted on the society by drug abusers is their treatment and rehabilitation cost. In this context, the orodental complications that are directly or indirectly related to drug abuse are one of the most important health problems of these individuals.^{10,11} In addition, since the functional and esthetic problems of the teeth in the population undergoing rehabilitation give rise to isolation and psychosomatic problems in such individuals,⁷ it appears that intervention or dental supervision is effective in the rehabilitation team. Oral health is a very important and necessary component of an individual's general health, and this special group of the community should adopt orodental health measures. However, sufficient studies have not been undertaken

on the subject, especially in Iran and in particular in Kerman City, Iran. Cultural, geographic, and socioeconomic factors affect the results of studies; and it seems that it is absolutely necessary to undertake studies in this field. The aim of the present study was to evaluate the relationship between drug abuse and orodental health in drug abusers.

Methods

This study was carried out on 204 addicts admitted to rehabilitation centers and 197 healthy controls referred to the urban health centers in Kerman City during 2016. Controls were matched for demographic variables. Multistage random sampling method was applied. All centers in different parts of Kerman were considered as a cluster. Among them, ten centers were selected randomly. At each center, the cases were chosen randomly according to their records number. Controls were selected through non-probability convenience sampling and were adjusted by age and gender. The sample size was calculated using a confidence coefficient of 95% ($\alpha = 0.05$, $z = 1.96$). Mean and standard deviation (SD) of decayed, missed, and filled teeth (DMFT) in previous studies was 15.57 ± 6.57 and 12.00 ± 5.50 for addicts and healthy controls, respectively. A design effect of 2 (due to the sampling method) and 20% attrition was considered. Oral and dental clinical examination was done by two trained senior dental students using a questionnaire. This questionnaire included demographic data (age, gender, level of education, employment status), data about oral and dental hygiene behavior (teeth brushing, use of dental floss, frequency of sugary foods consumption, smoking, the history of oral lesions), and data related to addiction (type, amount, method, duration, frequency of usage). Dental and periodontal examination was performed under normal light using disposable scaler, mouth mirror, and periodontal probe. For each participant, DMFT was calculated,¹² also Gingival Index (GI) was determined for each participant.¹³

Dental attrition, pigmentation, bruxism, hairy tongue, and tooth sensitivity were also evaluated. This study was approved by The Ethics Committee of the Research Review Board at Kerman University of Medical Sciences, Kerman (ethical code: IR.KMU.REC.1394.10). All questionnaires were completed anonymously after that oral consent was obtained. The participants were assured that the data would be used for research purposes. Patients with history of systemic diseases and using drugs that could affect oral conditions were excluded. At the end, a pamphlet about oral and dental health was given and participants were taught about oral health and its impact on general health.

Data were analyzed using SPSS statistical software (version 19, SPSS Inc., Chicago, IL, USA). T-test, analysis of variance (ANOVA), and chi-square test were used. $P < 0.050$ was considered as statistical significance level.

Results

204 addicts and 197 healthy controls were evaluated in terms of oral and dental health. The mean and SD of age was 37.70 ± 11.80 and 34.02 ± 9.10 for addicts and controls, respectively. Out of 204 addicted persons, 94.6% were men and 10.9% were unemployed. Table 1 shows demographic

data of addicts admitted to rehabilitation centers and the healthy controls. Among addicts, the most common abused substance was opium. Duration of consumption in 35.3% was 6-10 years. The age of first use in 45.1% was 18-24 years. Table 2 shows addiction characteristics according to type, amount, method, duration, and frequency of usage. The mean of decayed (D) index in the case and control groups was 10.87 and 7.11, respectively, with mean of missing (M) indexes being 10.72 and 5.73, and mean of filled (F) indexes of 1.67 and 2.95, respectively. Mean and SD of DMFT in addicted and control groups were 23.29 ± 6.20 and 15.80 ± 6.40 , respectively. Mean and SD of GI indices in addicted and control groups were 1.23 ± 0.70 and 0.88 ± 0.70 , respectively. There were significant differences between DMFT and GI between two groups ($P = 0.001$). There was also statistically significant difference between addicted and healthy groups in using dental floss ($P = 0.010$), attendance to dentist ($P = 0.005$), having oral lesions ($P = 0.001$), and temporomandibular joint (TMJ) problems ($P = 0.001$). Table 3 shows comparison of oral health behavior and oral lesions status between addicts and healthy controls.

Table 1. Comparison of socio-demographic data in addicts admitted to rehabilitation centers and the healthy controls

Socio-demographic characteristics		Addicts [n (%)]	Healthy controls [n (%)]	P
Gender	Men	193 (94.6)	177 (89.8)	0.070
	Women	11 (5.4)	20 (10.2)	
Level of education	Illiterate	9 (4.4)	7 (3.6)	0.010*
	High school	107 (52.7)	47 (23.9)	
	Diploma	61 (30.0)	99 (50.3)	
Employment status	Academic	26 (12.8)	44 (22.3)	0.010*
	Employee	29 (14.4)	42 (21.8)	
	Self-employed	150 (74.6)	117 (60.6)	
Marital status	Unemployed	22 (10.9)	34 (17.6)	0.300
	Married	154 (75.9)	143 (73.7)	
	Single	45 (22.2)	50 (25.8)	
Residence status	Divorced	4 (2.0)	1 (0.5)	0.040*
	Urban	165 (81.3)	162 (88.5)	
	Rural	37 (18.2)	18 (9.8)	
	Suburban	1 (0.5)	3 (1.6)	

*Statistical significance

Table 2. Addiction characteristics according to type, amount, method, duration, and frequency of usage

Variables		n (%)
Abused substance	Opium	182 (89.2)
	Resin	146 (71.6)
	Heroin	45 (22.1)
	Codeine	3 (1.5)
	Marijuana	21 (10.3)
	LSD	9 (4.4)
	Ecstasy	4 (2.0)
	Cocaine	2 (1.0)
Duration of consumption (year)	≤ 1	2 (1.0)
	1 to 5	65 (31.9)
	6 to 10	72 (35.3)
	≥ 11	65 (30.8)
Method of use	Oral and inhalation	100 (49.0)
	Inhalation	85 (41.7)
	Oral	18 (8.8)
	Injection	1 (0.5)
Age of first use (year)	≤ 17	21 (10.3)
	18-24	92 (45.1)
	25-34	75 (36.8)
	≥ 35	16 (7.9)
Frequency of daily consumption	Once	30 (14.7)
	Twice	71 (34.8)
	Three times	87 (42.6)
	≥ three times	16 (7.9)

LSD: Lysergic acid diethylamide

Discussion

This study tried to investigate the relationship between drug abuse and orodental health in drug abusers in Kerman. Opium was the most commonly-used drug in the present study, consistent with the results of studies by Shekarchizadeh et al.⁵ in Tehran and Saied-Moallemi et al.¹⁴ in Isfahan, which might be attributed to the history of the abuse of this addictive agent in Iran. In relation to oral health behaviors, half of the subjects did not brush their teeth at all and 97.1% of the subjects did not use dental floss; the results reported by Shekarchizadeh et al. showed that 48.0% brushed their teeth once or less in a day.⁵ Saied-Moallemi et al. reported that 73.0% of addicts brushed their teeth very low.¹⁴ The results of a study by Morio et al. in the United States showed that 6.0% of drug addicts brushed their teeth twice a day or more.¹⁵ In a study in Brazil on drug abusers under rehabilitation, 30.0% of the subjects used dental floss.¹⁶ In the present study, 70.6% of the subjects took sugary snacks during the day for several times, consistent with the results of the two studies mentioned above.^{5,14}

Table 3. Comparison of oral health behavior and oral lesions status between addicts and healthy controls

Variables		Addicts	Controls	P
DMFT (mean ± SD)		23.29 ± 6.20	15.80 ± 6.40	0.001*
GI (mean ± SD)		1.23 ± 0.70	0.88 ± 0.70	0.001*
Tooth brushing [n (%)]	Yes	88 (43.1)	99 (50.3)	0.150
	No	116 (56.9)	98 (49.7)	
Dental flossing [n (%)]	Yes	6 (2.9)	18 (9.1)	0.010*
	No	198 (97.1)	179 (90.9)	
Using sweet snacks during the day [n (%)]	Yes	144 (70.6)	141 (71.6)	0.800
	No	60 (29.4)	56 (28.4)	
Smoking [n (%)]	Yes	131 (64.2)	60 (30.8)	0.001*
	No	73 (35.8)	135 (69.2)	
The last visit to the dentist [n (%)]	6 months ago	19 (9.5)	11 (5.7)	0.005*
	1 year ago	33 (16.4)	57 (29.5)	
	≥ 2 years ago	149 (74.1)	125 (64.8)	
Oral lesion [n (%)]	Yes	133 (65.2)	90 (45.7)	0.001*
	No	71 (34.8)	107 (54.3)	
Dry mouth [n (%)]	Yes	90 (44.1)	27 (13.7)	0.001*
	No	114 (55.9)	170 (86.3)	
Dental hypersensitivity [n (%)]	Yes	39 (19.1)	53 (26.9)	0.060
	No	165 (80.9)	144 (73.1)	
Bruxism [n (%)]	Yes	38 (18.6)	47 (23.9)	0.200
	No	166 (81.4)	150 (76.1)	
Need to emergency treatment [n (%)]	Yes	25 (12.3)	27 (13.7)	0.660
	No	179 (87.7)	170 (86.3)	
TMJ problem [n (%)]	Yes	20 (9.8)	0 (0)	0.001*
	No	184 (90.2)	197 (100)	

*Statistical significance

DMFT: Decayed, missed, and filled teeth; SD: Standard deviation; GI: Gingival index; TMJ: Temporomandibular joint

Studies showed that oral health status was poor in drug substance abusers.^{6,8,17}

It appears that the drug abuse rehabilitation centers should pay attention to tooth brushing and using dental floss in conjunction with other treatment modalities. Drug abuse gives rise to a decrease in motivation and self-confidence; therefore, there is a significant decrease in oral hygiene habits and the frequency of dental visits.¹⁸

In the present study, xerostomia was detected in 44.1% of the subjects. Drug abuse results in xerostomia, which in turn decreases the salivary pH and increases the formation of plaque and dental calculus. All these factors increase the incidence of dental caries and periodontal diseases.¹³ In addition, it has been reported that some addictive agents change the chemical composition of saliva, resulting in xerostomia. Dehydration resulting from drug abuse increases the metabolic rate, and an increase in physical activity results in xerostomia.¹⁹

In relation to lesions in the subjects, the most prevalent single lesion was hairy tongue. This lesion is seen in 0.5% of the adult population, the majority of which are heavy smokers. Other factors include general weakness, poor oral hygiene, and use of drugs that result in xerostomia.²⁰ The high prevalence of this lesion in subjects in the present study might be attributed to poor oral hygiene and xerostomia due to the concomitant use of tobacco and drug abuse.

In the present study, the second most prevalent lesion was oral pigmentation. In a study by Akbari et al.,¹⁸ 34.5% of the subjects and in a study by Shirzaei,²¹ 30.8% of the subjects had oral pigmentation, which is less than that in the present study. It should be pointed out that in similar studies, it has not been mentioned whether pigmentation has been a solitary lesion or it has been associated with other lesions. In the present study, 1.5% of addicted subjects had leukoplakia, that is lower than Akbari et al.¹⁸ study in which 4.0% had leukoplakia.¹⁸

The mean and SD of DMFT in the present

study was 23.29 ± 6.20 , with a significant difference from that in the control group. In the study by Akbari et al., DMFT was 21.80 ± 4.10 in women and 17.50 ± 2.80 in men.¹⁸ Drug abuse might increase the inclination to consumption of simple sugars, which is an etiologic factor for dental caries.

Rampant caries has been reported in intravenous heroin abusers, irrespective of their orodental hygiene status.²²

The plaque index of the subjects in the present study was 1.23 ± 0.74 , with a significant difference from that in the control group. This finding is similar to Saied-Moallelemi et al.¹⁴ study. Opium and heroin abusers exhibit hyposalivation leading to xerostomia, burning sensation in the oral mucosa, and periodontal diseases.⁹

The means of D and F indices in the case and control groups were significantly higher in the case groups. This might be attributed to a lack of oral hygiene and lack of sufficient motivation to take care of teeth in drug abusers. In addition, apart from poor oral hygiene, the general hygiene is also poor in drug abusers. This is significant because 56.9% of the subjects did not use toothbrush and toothpaste and 97.1% did not use dental floss, with 70.6% taking sugary snacks.

In the control group, 50.3% of the subjects used toothbrush and toothpaste to clean their teeth, with no significant difference from the case group. In the control group, 9.1% of the subjects used dental floss, which was significantly different from the case group, which might be attributed to the higher oral hygiene in the control group. In the control group, 30.8% of the smoking subjects abused drugs, too, which is significantly different from that in the case group and is attributed to the psychological dependence on drugs. A total of 35.2% of the subjects in the control group had referred a dental office during the previous 6-month period, which was significantly different from that in the case group. This might be attributed to the great attention of non-drug abusers to their orodental health.

One of the reasons for a lack of significant differences in tooth sensitivity between the two groups might be the fact that in the present study the subjects were questioned about tooth hypersensitivity to cold and warm water, and thermal tests were not used. It is suggested that in future studies thermal tests be used.

This study showed that bruxism was more prevalent in drug abusers compared to the control subjects but the difference was not significant, which might be attributed to the fact that bruxism depends on factors such as anxiety, stress, and type of occlusion apart from drug abuse, and the factors above might have resulted in a lack of significant difference in this respect between the two groups.

The results of the present study showed no significant differences in emergency treatments between the two groups, which might be explained by the fact that since a rehabilitation clinic was referred to for selection of matched case and control groups to evaluate drug abuse, the subjects had only referred for restorative procedures and dental check-ups, which is different from those referring to dental offices and clinics for emergency treatments.

In the present study, there were significant differences in TMJ problems between the two groups, which might be attributed to the fact that addictive agents result in an increase in muscular activity, giving rise to bruxism and attrition, pain in maxillofacial muscles, and injuries to the TMJ.

Conclusion

The result of the present study showed that the means of DMFT and GI indexes were

significantly higher in addicted participants. Oral lesions, dry mouth, dental hypersensitivity, and TMJ problems were significantly higher in addicted participants.

One of the limitations of the present study was the incorrect responses of some drug abusers to some questions on the questionnaire, which were excluded from the study. The present study was done on the subjects who attended the rehabilitation centers and they were only a sample of the whole population of drug abusers. Therefore, the results of the present study cannot be generalized to the whole population of drug abusers.

It is suggested that the rehabilitation centers offer dental counseling, oral hygiene instructions, use of fluoride and a proper diet in addition to psychological counseling in order to improve the dental status, apart from the general health.

Moreover, it is suggested that the orodental effects of drug abuse, especially the effects of new drugs, be explained by dentists in the mass media. Furthermore, it is advisable to hold workshops by gaining assistance from the academic staff of universities on the management of orodental complications of drug abuse.

Conflict of Interests

Authors have no conflict of interest.

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