

## Dental health status of institutionalized Saudi male chronic drug abusers

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هدفت هذه الدراسة الى استقصاء صحة الفم ومدى انتشار امراض الاسنان لدى مجموعه من السعوديين البالغين والمدمنين للمخدرات وتضمنت الدراسة ٤٦٧ مدمناً تم اختيارهم من ثلاث مصحات رشيده بالمملكة العربية السعودية. بالإضافة الى استخدام المؤشرات المقترحة من منظمة الصحة العالمية لدراسة امراض الاسنان فقد تم جمع معلومات عن المواد المستخدمة وطرق استخدامها ومدة تعاطيها بالإضافة إلى المعلومات الشخصية لكل متعاطي مثل اسلوب العناية بالاسنان، المستوى التعليمي والدخل الشهري. اظهرت النتائج وعلى الرغم من تفاوت اعمار العينة من ١٥-٦٦ سنة ان الغالبية من صغار السن ومن مستويات اجتماعية وتعليمية متدنية وتفاوتت مدة التعاطي من ١-٣٥ سنة بمعدل ٧ مرات او اكثر بالاسبوع لدى اكثر من النصف وكانت مادة الكحول هي المفضلة لدى الغالبية سواء على مستوى المواد المستخدمة او المتعاطاه عن طريق الفم. امتنع مايعادل ثلث العينة عن العناية بصحة الفم والاسنان كتنظيف الاسنان والزيارات الدورية لإطبائهم بعد الامان وظهر مؤشر نخر - فقد - حشي الأسنان بمعدل (١٠ و٦٣) وكانت النسبة الاكبر للاسنان المصابة بالنخر (٧ او) والاصفر للاسنان المعالجه (١). اما نخر الأسنان فقد وجد في ما يقارب ٧١٪ من العينة بنسبة متساوية بين الاسطح الخارجيه للاسنان والسطح الاطباقي. وكذلك ظهر مؤشر الصحة الفموية بمعدل ٢ و٤٢ وكان اكثر من ٥٠٪ يعانون من تجمع القلح على الاسنان بينما كان مؤشر الصحة حول السنوية للمجتمع ١ و٦٣ وان الغالبية (٥٠٪) يعانون من امراض اللثة والجيوب اللثوية ذات العمق الاكبر من ٤ مم. دللت هذه الدراسة ان صحة الفم عند المنمنمين السعوديين مترديه وانها ذات طابع اجتماعي وتعليمي منخفض ولذا يجب عدم اغفال دور الامان في تردي صحة الفم عند هذه المجموعات على الرغم من ان امراض الفم والاسنان ذات ابعاد متعددة.

The aim of this study was to investigate the oral health status of male Saudi drug abusers and to determine the prevalence of dental diseases among this group. Four hundred sixty-seven male drug abusers housed in three narcotic addict rehabilitation centers in Saudi Arabia were interviewed and their drug addiction and oral health status were investigated. Their oral health status was evaluated using the World Health Organization recommended procedures for decayed, missing, filled teeth and the periodontal status. The age range of the study group was 15-66 years with a mean age of 30.3 years and the majority (59.1%) were of younger age with low social and economic status and the level of education was relatively low. The drug abuse experience ranged from 1-35 years and the majority were alcoholic (42.8%) and amphetamine users (41%). The use of oral substances such as alcohol and recreational drugs was very common (66.2%) and more than 50% of the participants practiced the habit for more than 7 times per week and many of them used more than one drug. The oral hygiene measures declined and almost one third of the participants stopped tooth brushing as soon as they became addicts. The mean DMFT value was 10.63 ( $\pm 6.8$ ). Analysis of the index into its individual components showed that the mean decay value formed the largest component of the index (7.1) while the mean filled tooth value was nearly one. Dental caries was recorded in 70.7% of the subjects. They presented as smooth and cervical caries and the mean prevalence of occlusal and surface caries was almost equal. The mean Oral Hygiene Index (OHI) was 2.42 and more than 50% of the participants presented with calculus deposition. The mean Community Periodontal Index (CPI) was 1.63 and approximately more than 50% of the subjects had periodontal pocketing of 4 mm and over in depth. The oral health in general was poor among the drug abusers who were of low socioeconomic groups and with low education. Although deterioration of oral health is multifactorial, the effects of drug abuse cannot be overlooked in the study of this high risk group.

### INTRODUCTION

Drug abuse and narcotic addiction are acknowledged problem all over the world having both social and medical implications. They affect a wide range of the population from all socioeconomic

classes and both genders are equally affected. The incentive which lead to the addiction is complex and vague, however, drugs are generally abused because they produce changes in the feelings and emotions of the user and many abusers stated that they turned to drugs because they were frustrated, isolated or lost interest to compete in an impersonal society.<sup>1</sup> Several drugs of addiction related-effects are found to be in common use in the Saudi society such as alcohol, heroin, cocaine, morphine, amphetamines and barbiturates.<sup>2</sup>

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The health consequences of drug abuse are serious and the oral health is negatively affected in any society where drug dependency is widespread.<sup>3</sup> This is most likely because of the physical and emotional instability of the addict along with lack of concern of oral health.<sup>4</sup> The prevalence of dental caries and periodontal diseases has been reported to be higher among drug abusers than the rest of general population.<sup>5-9</sup> Drug abusers have been reported to suffer from constipation, xerostomia, dislike for solid food and craving for sweets,<sup>10</sup> which could contribute to high rates of dental diseases.

A review of the literature reveal lack of information on the oral health status of Saudi drug abusers and most of the information available on the dental health status of drug abuser was derived from other studies conducted in different countries most of which are western. These studies demonstrated high caries prevalence, poor periodontal health and deteriorated oral hygiene.<sup>5-10</sup> The purpose of this study was to investigate the dental health status and to determine the prevalence of dental diseases among a sample of Saudi drug abusers institutionalized in multi narcotic rehabilitation centers in Saudi Arabia.

## MATERIALS AND METHODS

Four hundred sixty-seven male drug addicts were randomly selected and interviewed and their oral health status was examined in three major narcotic addict rehabilitation centers at Riyadh, Jeddah and Dammam in Saudi Arabia in the year 2000. All these centers provide educational and rehabilitation programs for the drug abusers. The numbers of participants in these centers were 296, 93 and 78, respectively. They all consented verbally to participate in this study. The participants were given

a pre-tested questionnaire that included questions on education, employment, annual income, dental clinic attendance and oral hygiene measures, drug use habit, period of drug abuse and drug preference. The data of the questionnaire were categorized into socio-demographic, oral hygiene measures and drug related characteristics. The intra-examiner variability was assessed by double examination of 10 subjects from each of the three centers and the difference was found to be of no significance (< 7%).

Dental examination was conducted by an experienced dentist in a medical room using portable dental equipments and under natural light. Examination for dental caries and periodontal diseases was carried out with a mirror, explorer and a CPI periodontal probe in accordance with the WHO recommendations (1997).<sup>11</sup> The DMFT index was used to record decayed (D), missing (M) and filled (F) teeth and the results were presented as the mean of the overall DMFT score and the various DMFT components. Caries was further assessed and recorded as occlusal or smooth surface caries and the prevalence presented in term of percentages along with the mean for each type of lesion. The status of periodontal health was assessed using the Community Periodontal Index (CPI) for four parameters; healthy, bleeding, calculus and periodontal pockets using community periodontal probe for detecting subgingival calculus and to measure the pocket depth and recorded for the maximum of sextant. The findings were presented as a mean of CPI score and the percentage of each parameter. The status of the oral hygiene was recorded using the Simplified Oral Hygiene Index (OHI-S) of Greene and Vermillon,<sup>12</sup> for presence or absence of plaque and calculus. It was presented as OHI mean score and the percentage of the level of oral hygiene.

Data analysis was done using Minitab software V.10 and the results presented in terms of percentages of each variable. The change in the habit of oral hygiene practices before and after drug addiction was examined statistically by Wilcoxon Non-Parametric test at a significant level of 0.05.

## RESULTS

The age range for the 467 participants was from 15 to 66 years and the mean age was 30.3 years (Table 1). The majority of the participants were 30 years old or younger (59.1%) and only 1.7% were older than 50 years. Three hundred and nineteen subjects (68.2%) reported low educational achievement with elementary and intermediate schooling. Higher education in the form of secondary school or university education was reported by 23.5% of the participants and only 7.5% had no qualification whatsoever but they were not illiterate. Almost half of the subjects (49.5%) were unemployed and 43.1% were either self or government employee. Students' formed 7.5% of

the whole sample. Nearly 78% of the participants received an income of 2500 SR or less / month and only 3.9% reported a higher income of more than 10,000 SR while five subjects failed to report their income.

Almost half of the participants (45.8%) reported occasional tooth brushing before they were engaged in the drug addiction and 44.8% brushed their teeth occasionally afterwards (Table 2). No statistically significant differences ( $P > 0.05$ ) were found in tooth brushing among the study sample before and after addiction. The overall habit of tooth brushing from once to three times a day was reported by 35.3% and 30.4% of the subjects before and after addiction, respectively. A decline in the frequency of teeth brushing after drug addiction was observed among those who brushed their teeth twice and three times a day. One hundred and sixteen participants (24.8%) never brushed their teeth after drug addiction compared to 18.8% who claimed that they never cleaned their teeth before the drug addiction started. Approximately 79% of the participants visited the dentists only when in pain and only 6.4% reported dental visits for regular checkup. Nearly 15% of the

**Table 1.** Socio-demographic characteristics of drug users

Variables		No.	%	
(n=467)				
Age groups	15-30	276	(59.1%)	
	31-50	183	(39.2%)	
	51-66	8	(1.7%)	
Occupation	Self employed	6	(1.3%)	
	Government employed	195	(41.8%)	
	Unemployed	231	(49.5%)	
	student	35	(7.5%)	
Education	No qualification	35	(7.5%)	
	Elementary	151	(32.3%)	
	Intermediate	168	(35.9%)	
	Secondary	86	(18.4%)	
	University	24	(5.1%)	
Graduate level		3	(0.6%)	
	Monthly income	<= 2500 SR	365	(78.2%)
		> 2500-10000 SR	79	(16.9%)
		>10000 SR	18	(3.9%)
No response		5	(1.1%)	

**Table 2.** Oral hygiene practices and dental visit among drug addicts related information

Variables		No.	%
(n=467)			
Tooth brushing (before addiction)	Occasionally	214	(45.8%)
	Once/day	64	(13.7%)
	Twice/day	72	(15.4%)
	Three times/day	29	(6.2%)
	Never	88	(18.8%)
Tooth brushing (after addiction)	Occasionally	209	(44.8%)
	Once/day	71	(15.2%)
	Twice/day	57	(12.2%)
	Three times/day	14	(3.0%)
Never	116	(24.8%)	
Dentist visit	On pain	368	(78.8%)
	Regular visit	30	(6.4%)
	Never	68	(14.6%)

participants stated that they had never visited a dentist in their life.

Table 3 shows drug-related characteristics. Alcohol was the most common substance abused by 43% of the subjects, followed by amphetamine (41.8%) and cocaine (35.5%). The use of heroin was reported by 26.1% of the participants and 19.1% reported the use of other recreational drugs such as cannabis, barbiturates and solvents. About two-thirds (66.2%) of the participants reported taking drugs via oral route and this was followed by intravenous (37.7%) and nasal routes (12.6%). Regarding the frequency of intoxication / week, over half (52.7%) of the respondents reported the use of drugs more than 7 times / week and 33% reported the use of the drugs 1 to 3 times a week. The duration of drug abuse ranged from 1 year up to 35 years and the prolonged use was mostly associated with alcohol abuse. Approximately, one-third of the participants reported using the drugs for more than 9 years and 27.4 % reported the use for 1 to 2 years.

The prevalence of dental diseases and the status of dental health are shown in Table 4. Almost 71% of the participants

had caries which appeared to be either occlusal caries or surface caries. The mean value for occlusal caries was 4.27 and 3.47 for smooth surface caries. The mean DMFT value was 10.63 and the largest proportion of the index was made up by the decay component (7.1) while the smallest component was filled teeth (0.99) and the missing component accounted for 2.54. Only 11 (2.4%) participants presented with healthy gingiva and good oral hygiene. Plaque accumulation among the subjects ranged from slight (17.8%) to heavy (16.1%) and supragingival debris and calculus was found in the majority of drug users (63.6%) with a mean Oral Hygiene Index (OHI) value of 2.42 for all users. Bleeding on probing and subgingival calculus was found in 2.4% and 37.3% of the participants, respectively. The mean value for the Community Periodontal Index (CPI) was 1.63 and the maximum CPI was recorded as grade 4 in 8.6% of the participants ( $\geq 6$  mm pocketing) while 42.8% had 4-5 mm pocketing.

**Table 3.** Drug related practices of the drug users

Variables		No.	%
		(n=467)	
Type of drug used	Alcohol	201	(43.0%)
	Amphetamine	195	(41.8%)
	Cocaine	166	(35.5%)
	Heroin	122	(26.1%)
	Others*	89	(19.1%)
Route of administration	Oral	318	(66.2%)
	Nasal	59	(12.6%)
	Intravenous	76	(37.7%)
Frequency of intoxication/ week	1-3 times	154	(33.0%)
	4-6 times	65	(13.9%)
	> 7 times	246	(52.7%)
Duration of drug use	< = 2 years	128	(27.4%)
	3-5 years	122	(26.2%)
	6-8 years	75	(16.0%)
	> =9 years	142	(30.3%)

\*Others: cannabis, solvent, recreational drugs

**Table 4.** Oral health status and dental disease characteristic

Variables		No.	%	Mean ( $\pm$ SD)	
		(n=467)			
DMFT				10.63	6.81
Filling				0.99	1.76
Decay				7.1	4.92
Missing				2.54	3.99
Caries prevalence		330	(70.7%)		
Occlusal caries				4.27	3.51
Surface caries				3.47	4.09
Oral Hygiene Index (OHI)	Good	11	(2.4%)		
	Slight plaque	83	(17.8%)	2.42	0.87
	Plaque	75	(16.1%)		
	Calculus	297	(63.6%)		
Community Periodontal Index (CPI)	Healthy	42	(9.0%)		
	Bleeding	11	(2.4%)		
	Calculus	174	(37.3%)	1.63	0.91
	4-5 mm pocketing	200	(42.8%)		
	$\geq 6$ mm pocketing	40	(8.6%)		

## DISCUSSION

While several studies have been reported regarding the prevalence of dental diseases and dental health status in Saudi population, there has not been available information documented in relation to drug abusers' dental health status. This paper therefore provides background information on the status of oral health and oral hygiene practices among a group of male drug abusers undergoing rehabilitation at three major narcotic detoxification centers in Saudi Arabia. In Saudi Arabia, the convicted abusers are introduced to an integrated preventive, curative and post-curative follow-up program which aims to help the convicted person to start a new prospective life with prosperous productivity and creativity in the society.<sup>2</sup>

The drug users in this study were mostly young adults with low educational achievement, low income and with high rates of unemployment. Despite the prohibition of the use of alcohol and narcotic drug in the Islamic society, Abalkhail<sup>13</sup> suggested that Saudi young people are more open to develop drug dependence and drug addiction as they are more prone to international media exposure, travel more frequently and are more liable to social frustration. In addition, poor school performance, psychological and behavioral disorders, low self-esteem, low religious involvement and lack of purpose and social responsibility may cause such individuals to be more vulnerable to drug addiction.<sup>14-16</sup> It is well known that abusers often got trapped in the habit of addiction and consequently fall into neglect and lack of concern about their general health.<sup>14</sup> The socioeconomic status on the other hand, regardless of being high or low, plays an important role in drug abuse and addiction when the user becomes consumed by the need for the drug to reduce the feelings of anxiety, fear or stress.<sup>1</sup>

The results of this study indicated that alcohol and amphetamine abuse were preferred by the majority of addicts. It seems that the sedative effect of alcohol in tension reduction and relaxation made it the most popular substance abused by Saudi. The differences in drug preference is probably related to what has been suggested previously by Abalkhail<sup>13,14</sup> and others<sup>15-17</sup> that cultural, educational and living style may influence the drug selection in different Saudi social classes. The large proportions of the participants in this study were alcohol abusers followed by those who had substance dependence and narcotic addiction. Addiction of heroin on the other hand accounted for almost the quarter coming next to cocaine and recreational drugs abuse. Beside its effect in induction of a state of euphoria and mental detachment, heroin is associated with high physical dependence, leading to habituation and tolerance and its users may use all their energies and resources to obtain the drug.<sup>1, 13</sup>

Drug abusers have significantly high levels of dental diseases.<sup>5-9</sup> In this study, the individual component of the DMFT value showed more untreated carious lesions, more extracted and few filled teeth. The high levels of caries in drug addicts might be explained partly by the pharmacologic effect of the drug beside the dietary habits and inadequacy of the oral hygiene measures.<sup>18-20</sup> Only few filled teeth were recorded and the mean value of missing teeth was relatively high in drug abusers. Drug users rarely received comprehensive dental care and the majority sought dental help only when they suffered from dental pain and the treatment was mostly in the form of extraction.<sup>3,4</sup> The prevalence of dental caries in smooth and cervical surfaces are considerably high and this may be explained by the use of heroin by some addicts. High rate of smooth and cervical caries have been widely described in

opoid users.<sup>6, 18</sup>

The periodontal condition and oral hygiene status is relatively poor in drug addicts and drug dependents.<sup>19,20</sup> High rates of periodontal diseases were observed in this study among the participants and the pattern of the disease is typically adult periodontitis, characterized by loss of attachment. The calculus deposits were pronounced for the majority of the subjects since brushing of teeth was practiced infrequently by the majority of drug abusers before and after they became drug addicted. It seems that the effect of drug abuse on the periodontium was due to a high rate of plaque accumulation and calculus deposits, resulting from oral hygiene neglect, xerostomia and alteration in microbial profile.<sup>21</sup> Although there was no statistically differences in tooth brushing before and after addiction, the number of users who reported no teeth brushing after addiction has increased considerably after drug commencement. The periodontal health is heavily dependent on the individual personal oral hygiene and therefore, any improvement of the periodontal status is unlikely as long as drug dependence is the major concern in the addict individual's life.

The mean DMFT, CPI and OHI in drug abusers observed in this study were clearly higher compared to those for the general population of the same age groups.<sup>22, 23</sup> This indicates that the negligence of oral hygiene in these deprived groups is a leading cause in the deterioration of dental health and increase in the level of dental diseases. Comparing these indices to what has been reported in drug abusers in western countries, it appears that they are less in magnitude which may reflect the diversity among different countries.<sup>5-9</sup>

The oral health in drug abusers is generally poor and the deterioration of the oral health is truly a health problem. Although, the etiology of dental

diseases is numerous, the poor dental health is due to lack of self image, depression and lack of motivation. In addition, many drugs are associated with undesirable pharmacological effects such as reduction in saliva secretion and an increased craving for sweets. These factors account for the low standard of oral hygiene and appear to be responsible for the high incidence of dental diseases. In view of the complexity of drug addiction, improvement of the oral health accentuates the importance of developing an integrated dental health program within the drug addicts' rehabilitation and re-socialization campaign. High awareness of the implications of drug addiction in those who may show neglect in their dental health would reduce the incidence of drug-related diseases and therefore help in attaining a healthier life style.

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