

Oral Sensations among Individuals with Illicit Drug Dependence in Rehabilitation Centers: A Cross-Sectional Study

Lipsa Bhuyan, Roquaiya Nishat¹, Balasubramanya Goutham², Kailash Chandra Dash, Pallavi Mishra, Niva Mahapatra

Department of Oral and Maxillofacial Pathology, Kalinga Institute of Dental Sciences, KIIT, Deemed to be University, Bhubaneswar, Odisha, ¹Department of Dentistry, Nalanda Medical College and Hospital, Patna, Bihar, ²Department of Public Health Dentistry, ITS, Noida, Uttar Pradesh, India

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ABSTRACT

Background: In developing countries like India, irrespective of the various government laws and actions, substance abuse is a growing problem. Individuals with illicit drug dependence face social and psychological stigma with considerable health problems. Negligence to oral hygiene and lack of oral health treatments intensifies the sensations experienced by the subjects. **Aim:** The aim is to determine the patterns of substance abuse and oral health sensations among individuals with illicit drug dependence. **Materials and Methods:** A cross-sectional study was conducted wherein 213 male individuals with illicit drug dependence history, admitted in rehabilitation centers of Bhubaneswar, formed the study population. Information pertaining to the type and duration of drug dependence along with oral sensations experienced by the individuals during a period of 3 months was obtained by interviewing by the subjects. Chi-square test was done to identify variations in oral sensations produced by different illicit drugs and its relationship with their usage pattern. **Results:** About 40.8% of dependents reported cannabis intake, thus making it the most commonly consumed drug. About 80.8% of all the subjects reported dryness of the mouth, 47.9% reported sensitivity of teeth and 28.2% suffered from the numbness of their mouth. About 19.7% of the individuals felt like chewing on something, 23% inclined toward grinding, whereas 11.7% experienced pain in the jaw muscles and joint. Sixty percent of substance dependents who smoked drugs had sensitive teeth ($P \leq 0.05$). All the oral sensations experienced were significantly more among drug dependents with a history of illicit drug usage for >5years in comparison to others. **Conclusion:** Substance abuse results in a range of oral sensations. De-addiction programs in India lack oral health-care components. Studies on oral complications related to addiction stresses on the need of oral healthcare at various levels, including education, prevention, and treatment. All these components should be amalgamated into general care services for addicts.

KEYWORDS: Cannabis, drug dependence, oral health sensations, rehabilitation centers, substance abuse

INTRODUCTION

Illicit drug abuse has become a global trend in this modern era.^[1] Besides creating social problems and general health issues, drug abuse is deleterious to oral health. Considering the World Drug Report 2014, a huge range of people in the age group of 15–45 years were addicted to at least one drug.^[2] India has witnessed a five times increase in drug haul from 2011 to 2013.^[2]

The UN has reported that 1 million heroin addicts are registered in India, whereas 5 million are unofficial abusers.^[2]

Address for correspondence: Dr. Roquaiya Nishat, Department of Dentistry, Nalanda Medical College and Hospital, Patna - 800 007, Bihar, India. E-mail: ruksdento@gmail.com

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Cannabis, heroin, and pharmaceutical drugs are the most frequently abused drugs in India. Oral health problems are among the most common complications associated with drug abuse in addition to worsening of one's lifestyle.^[3] Drug abuse can have both direct and indirect consequences on oral health. Drug dependents fail to maintain their nutrition, oral, and general health due to their physical and psychological dependence on drugs, which can directly affect dental and periodontal health.^[3] Heroin, methamphetamine, cocaine, cannabis, and brown sugar has an indirect negative effect on teeth. They cause severe dry mouth and an immense craving for sugars such as candy and soft drinks, which ultimately, in the long run, lead to caries. Methamphetamine drugs are extremely acidic, creating a detrimental environment for teeth. Cocaine also causes users to clench and grind their teeth, wearing down the surface enamel. Thus, abusing drugs contributes to tooth decay, tooth wear, mucosal ulcerations, discoloration of teeth, and periodontal diseases.^[1] In addition, these drugs can also produce sensations such as dry mouth, grinding or clenching of teeth, tenderness in the masticatory muscles or temporomandibular joint (TMJ), numbness in the mouth, cheek biting, lip biting, tongue biting, sensitive teeth and difficulty in opening mouth.^[1,4] Thus, better knowledge about the effects of drug abuse can provide us with detailed information to be alert about their misuses and ill consequences.

Overdosing of drugs tends to cause nausea, hallucinations, depression, and tremors, which are in terms of general health, but very few reports have been established in favor of the sensations or short-term effects associated with oral health.^[1] Therefore, the present study was done to assess the various oral health sensations concerned with the type of drugs abused and contrasting the extent of sensations experienced by the drug dependents. The study will help to facilitate a more comprehensive and multidisciplinary approach toward the management of drug abuse.

MATERIALS AND METHODS

This was a cross-sectional study conducted over a span of 3 months. The study comprised 213 male individuals admitted in the rehabilitation centers of Bhubaneswar, Odisha for illegal drug dependency. Ethical approval was obtained from the head of all the rehabilitation institutes involved in the study, and informed consent was obtained from individual participants before data collection.

Two hundred and thirteen individuals, ranging between 18 and 45 years of age with a prior history of illegal drug dependency, participated in the study. Subjects with systemic diseases like diabetes, hypertension were

excluded from the study. Individuals who willingly participated were included in the study.

Data collection

Demographic data were collected from each subject. A questionnaire was developed to assess the type, duration, and pattern of drug abuse along with the oral sensations experienced by the subjects during that period. Before the commencement of the study, an interview of a few subjects was conducted, wherein they were encouraged to express their experiences with oral sensations following illicit drug usage. The interview findings were used for content validation, following which the questionnaire was finalized. The questionnaire regarding individual characteristics was filled by the investigator after obtaining the information from the subjects.

Statistical analysis

Data analysis was performed by preparing frequency tables. Statistical analysis was done using the IBM corp. Statistical Package for the Social Science version 23.0, Armonk, New York. Chi-square test was done to analyze the variations in oral sensations.

RESULTS

The mean age group of illicit drug dependents was 30 ± 15 years. The questionnaire contained a set of enquiries regarding their educational qualification, occupation, marital status, past dental history, and tobacco habit. About 82.6% of the subjects had no past dental history, from which two conclusions can be drawn, either they were ignorant about their oral hygiene or were incapable of taking their oral health problems to the clinician. About 68.5% of the subjects were involved in smoking and 24.4% were involved in tobacco chewing besides consuming drugs. Regarding the route of administration of drug abuse, 44.63% of the subjects consumed illicit drugs by both smoking and sniffing, 39.0% consumed through smoking, whereas 17.8% were involved in sniffing. About half of the drug dependents (52.1%) used more than one type of illicit drugs. The frequency of drug abuse varied from <1 year to >5 years, with the highest resulting in 57.3% intake of drugs for >5 years before joining the rehabilitation center.

Drugs abused by the subjects were cannabis, brown sugar, heroin, and dendrite. These drugs were consumed singly or in the combination of any of the two drugs. About 40.8% of the subjects reported cannabis intake, thus making it the most popular choice of drug, followed by 21.1% joint intake of cannabis and brown-sugar. Cannabis-Heroin accounted for 12.2%, followed by 5.6% of dendrite and so on.

Before the subjects joined the rehabilitation centers, they were addicted to the drugs mentioned. Besides being exposed to various oral hard-tissue problems, they had experienced oral sensations including dryness of mouth, chewing feeling, grinding, pain in jaw muscles and jaw joint, numbness, lip biting, and sensitive teeth. About 80.8% of all recalled dryness of the mouth and almost half of them reported sensitive teeth (47.9%), which was followed by numbness in their mouth (28.2%) and grinding (23.0%). About 19.7% of the subjects felt like chewing while 11.7% experienced pain in the jaw muscles and jaw joint after intake of drugs. A miniscule of the dependents acquired the habit of biting of lips (9.9%).

Significant number of polyusers experienced clenching, lip biting and numbness, whereas more number of single users experienced dryness [Table 1]. Among all the individuals who smoked drugs, experienced dry mouth and about 60% of them had sensitive teeth ($P \leq 0.05$). Majority of sniffers experienced clenching, grinding, and numbness where as significant number who both sniffed and smoked drugs experienced dryness [Table 2]. All the oral sensations experienced were significantly more among drug dependents with >5 years of use in comparison to individuals with <1 year, 1–3 years, and 3–5 years of use [Table 3]. The feeling of chewing on something, pain and lip biting was significantly experienced by the subjects with frequency of drug abuse >6 times a week [Table 4].

DISCUSSION

Drug abuse is widely prevalent in India and has become a growing concern. It not only affects social and economic status but also the physical and mental health of people.^[5] This includes respiratory depression, cardiac crisis, nephropathy, liver cirrhosis, and infectious diseases such as hepatitis, AIDS, and tuberculosis. They also face injuries associated with disability, mental disorders such as depression, and oral health problems. Negligence to oral hygiene and lack of oral health treatments intensifies the sensations experienced by the subjects.^[6] Till date, the focus in relation to oral health sensations of drug abusers has been rarely put to notice due to the difficulties faced in recruiting suitable subjects from the general population.

For the present study, subjects who were currently in the rehabilitation centers and de-addiction centers were recruited as authentic results could be identified from this population without any disgrace.^[1] As the subjects in the rehabilitation centers were previously drug dependents, their mental and physical state varied from the ordinary population. Thus, after repeated attempts, they ensured

co-operation, and therefore, a high response rate was recorded. The present study was done to assess the various oral health sensations concerned with the type of drugs abused and the extent of sensations experienced by the individuals.

The mean age of subjects in the rehabilitation centers was 30 ± 15 and included males. Observing the age group and period of drug dependency of the study participants, it can be concluded that drug addiction is a problem that can begin from the teenage and continue if not terminated. In a study by McGrath and Chan the participants had started drug abuse at an age as low as 15 years.^[1] About half of them (52.6%) had been to college, 45.5% had been to high school and a small number (1.9%) were in or were elementary school drop outs. A majority of them were unemployed (41.8%), whereas 29.6% were employed or self-employed and 28.6% of them were students. Thus, it can be inferred that an alarming number of students take up drugs at a young age due to their easy availability and peer pressure.

Among the study population, 68.5% and 24.4% of the subjects were involved in smoking and smokeless tobacco, respectively, which was higher than Nigerian Motor park workers (40.5%).^[7] The illicit drugs primarily abused were cannabis, brown-sugar, heroin, and dendrite. These drugs were consumed singly or in the combination of any of the two drugs. Maximum subjects (52.1%) were poly-drug users, and therefore, the sensations could not be counted as a result of a single drug effect among all the abusers. This is often marked as a major flaw in drug addiction studies. About 40% of the drug dependents in the present study claimed to take cannabis also known as marijuana, individually, which was in consonance with studies by Adedigba *et al.* and Makanjuola *et al.*^[7,8] About 21% of them took it in combination with brown sugar and 7% with dendrite. A study reported heroin abuse by almost half of the sample population, whereas in our study, 0.5% abused heroin alone, 12.2% and 6.1% in combination with cannabis and brown sugar, respectively.^[1] This might be attributed to the low availability of the drug in this region. Adedigba *et al.*^[7] reported 3.8% of heroin usage among road transport workers. 5.6% of the sample population in the present study abused brown sugar, an adulterated form of heroin, which is a semi-synthetic opioid derived from the morphine extracted from poppy plants.^[9]

Dendrite is a popular adhesive broadly used in various sectors such as engineering, automobile, footwear, lather craft, home decor, carpenters and also for repairing punctured tyres. It contains a neurotoxin called toluene, which is a sweet-smelling and intoxicating

Table 1: Comparison of oral sensations with the number of illicit drugs abused by the individuals

Number of drugs abused	Dryness	Chewing feeling	Grinding	Pain	Lip biting	Numbness	Sensitive teeth
Single user (%)	90 (88.2)	7 (6.9)	23 (22.5)	9 (8.8)	2 (2.0)	11 (10.8)	62 (60.8)
Poly user (%)	84 (75.7)	38 (34.2)	29 (26.1)	18 (16.2)	20 (18.0)	55 (49.5)	37 (33.3)
Total	174	45	52	27	22	66	99
χ^2	5.606	23.899	0.127	1.339	14.979	65.051	5.725
<i>P</i>	0.018*	<0.001*	0.722	0.105	<0.001*	<0.001*	0.017

P*≤0.05: Statistically significantTable 2: Comparison of oral sensations with the route of administration of the drugs abused**

Route of administration of the drug	Dryness	Chewing feeling	Grinding	Pain	Lip biting	Numbness	Sensitive teeth
Oral (%)	83 (100.0)	3 (3.6)	12 (14.5)	9 (10.8)	1 (1.2)	7 (8.4)	49 (59.0)
Oral, nasal (%)	78 (82.1)	30 (31.6)	25 (26.3)	11 (11.6)	16 (16.8)	40 (42.1)	40 (42.1)
Nasal (%)	13 (37.1)	12 (34.3)	15 (42.9)	7 (20.0)	5 (14.3)	19 (54.3)	10 (28.6)
Total (%)	174 (81.7)	45 (21.1)	52 (24.4)	27 (12.7)	22 (10.3)	66 (31.0)	99 (46.5)
χ^2	25.141	12.805	11.096	2.051	12.403	38.118	10.504
<i>P</i>	<0.001*	0.002*	0.004*	0.359	0.002*	<0.001*	0.005*

P*≤0.05: Statistically significantTable 3: Comparison of oral sensations with the duration of the drug abuse**

Duration of usage	Dryness	Chewing feeling	Grinding	Pain	Lip biting	Numbness	Sensitive teeth
<1 year (%)	6 (100.0)	0	0	2 (33.3)	0	0	0
1-3 years (%)	47 (92.2)	4 (7.8)	11 (21.6)	2 (3.9)	0	11 (21.6)	32 (62.7)
3-5 years (%)	28 (82.4)	5 (7.8)	7 (20.6)	6 (17.6)	5 (14.7)	10 (29.4)	19 (55.9)
>5 years (%)	93 (76.2)	36 (29.5)	34 (27.9)	17 (13.9)	17 (13.9)	45 (36.9)	48 (39.3)
Total	174 (81.7)	45 (21.1)	52 (24.4)	27 (12.7)	22 (10.3)	66 (31.0)	99 (46.5)
χ^2	7.522	12.992	4.839	6.778	8.981	6.834	14.340
<i>P</i>	0.047*	0.005*	0.046*	0.046*	0.030*	0.029*	0.002*

P*≤0.05: Statistically significantTable 4: Comparison of oral sensations with the frequency of drug intake**

Frequency of drug intake	Dryness	Chewing feeling	Grinding	Pain	Lip biting	Numbness	Sensitive teeth
1-2 times (%)	82 (89.1)	11 (12.0)	20 (21.7)	3 (3.3)	7 (7.6)	26 (28.3)	50 (54.3)
3-5 times (%)	79 (76.0)	28 (26.9)	28 (26.9)	20 (19.2)	10 (9.6)	38 (36.5)	42 (40.4)
>6 times (%)	13 (76.5)	6 (35.3)	4 (23.5)	4 (23.5)	5 (29.4)	2 (11.8)	7 (41.2)
Total (%)	174 (81.7)	45 (21.1)	52 (24.4)	27 (12.7)	22 (10.3)	66 (31.0)	99 (46.5)
χ^2	10.528	11.511	1.812	19.377	10.879	3.992	9.102
<i>P</i>	0.015*	0.009*	0.612	<0.001*	0.012*	0.114*	0.028*

**P*≤0.05: Statistically significant

hydrocarbon (methylbenzene).^[10] In India, studies on abuse of kerosene, petrol, erasing fluid, and thinner has been previously described.^[11-13] When these intoxicants are smeared on a piece of cloth and inhaled, the users feel euphoric. They dissolve the membrane of the brain cell and cause hallucinations. Severe drying of facial skin and mucous membrane or perioral and perinasal pyoderma (Huffer's rash) and a distinct odor in the breath may be seen.^[14]

Maximum of the drug dependents (80.8%) suffered from dry mouth. This was in accordance with few previous studies.^[1,7] Almost every individual who consumed cannabis felt dryness in their mouth, followed by

sensitive teeth. The dryness caused due to cannabis is also known to be "cotton-mouth" and is a result of the activation of cannabinoids receptors located at the site of saliva formation.^[1,15] Majority of oral users experienced dryness when compared to nasal users (*P* ≤ 0.001) [Table 2]. Dryness was significantly more among drug dependents with <1 year, 1–3 years, and 3–5 years of use in comparison to >5 years of use [Table 4].

Individuals with substance abuse of stimulants such as ecstasy, amphetamines and cocaine, clenched and ground their teeth under the influence.^[2] 19.8% of the subjects experienced a "chewing on something"

sensation, mostly heroin users. Chewing feeling was significantly more among nasal users in comparison to both nasal and oral users, which was more than oral users [Table 2]. Friedlander and Gorelick stated that grinding of teeth/bruxism and TMJ disorders/pain in the jaw muscle/TMJ joint are commonly associated with the use of illicit drug abuse.^[16] Clenching and grinding were significantly more among individuals with 1–3 years, 3–5 years, and >5 years of use in comparison to <1 year of use [Table 3]. Grinding or clenching of teeth may result further in attrition of teeth and also serves as a reason for TMJ problems. Sensitive teeth were significantly more ($P = 0.005$) among oral users in comparison to both nasal and oral users, which was more than nasal users [Table 1], and also significantly more among subjects with 1–3 years, 3–5 years, and more than 5 years of use in comparison to <1 year of use [Table 3].

McGrath and Chan reported that about a third of their study population noticed numbness in the oral mucosa, which was in accordance with our study (28.8%).^[1] This may be ascribed to the analgesic properties of opioid drugs such as heroin.^[17] The numbness was significantly more among drug users with 1–3 years, 3–5 years, and >5 years of use in comparison to those who used it less than a year ($P = 0.039$). Lip biting was significantly more among drug users with 3–5 years and >5 years of use in comparison to <1 year and 1–3 years of use [Table 3]. Pain and lip biting was significantly experienced by the drug dependents who took in > six times a week [Table 4].

This study was limited by the survey design being self-reported past experience of the study population, which may have lead to over-reporting. In addition, the socioeconomic factors were not taken into consideration. Moreover, a small sample size of 213 may limit the generalizability of the data.

CONCLUSION

People with drug dependency problems need special care as compared to the normal population. Their negligent attitude adversely affects both general and oral health. De-addiction programs in our country lack oral health intervention. A multidisciplinary approach is necessary to deal with individuals with drug dependency issues in rehabilitation centers to provide adequate care. Moreover, social outreach programs should also be conducted to educate individuals about the adverse

effects of drug abuse, which would help them make a more informed decision about substance abuse.

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Conflicts of interest

There are no conflicts of interest.

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