

Drug abuse/ illicit drug use

Sanjeev Laller¹, Divya Vardaini^{2,*}, Kanwalpreet³, Mamta Malik⁴, Vijay Kumar⁵

^{1,4}Reader, ²Post Graduate, ³Lecturer, ^{1,4}Dept. of Oral Medicine and Radiology, ²Dept. of Pharmacology, ³Dept. of Conservative and Endodontics, ^{1,4}PDM Dental College & Research Institute, Bahadurgarh, Haryana, ²Santosh Medical College, Ghaziabad, Uttar Pradesh, ³BJS Dental College Ludhiana, ⁵Oscar Multispecialty Hospital and Trauma Center Rohtak, Haryana, India

***Corresponding Author:**

Email: dvardaini@gmail.com

Abstract

Illicit substance/drug abuse is on a rising trend globally. Illicit drugs are classified as stimulants, depressants and hallucinogens. These drugs are categorized into two groups of hallucinogens including crystal (methamphetamine), ecstasy (3,4-methylenedioxy-methamphetamine), marijuana and Lysergic Acid Diethylamide (LSD) and non-hallucinogens including opium, heroin and crack. Alcohol, opium and cannabis have been the traditional drugs of use in India with moderate consumption being ritualized in social gatherings. The long term effects of abusing drugs is the risk of developing permanent brain damage with various psychological, cognitive and behavioral effects that may manifest as depression, anxiety, memory loss and various neuropsychiatric disorders. In some cases drug abuse can result in death by various means: malignant hyperthermia, internal bleeding, fatal overdosing and through allergic reactions. Illicit drug abuse produces a wide range of oral health sensations. This paper discusses the illicit drugs and their effect on general health with more emphasis on oral health.

Keywords: Drug abuse, Substance abuse, Illicit drugs, Oral health.

Introduction

Substance abuse is an alarming health problem worldwide. Apart from the serious consequences experienced by drug users, such abuse also adversely affects the operational activities of law enforcement system, family members, teachers, doctors and health care workers. Adverse pharmacological and physiological effects predispose to detrimental psychological (irritability, paranoia, panic, repetitive stereotyped behavior, diaphoresis, mydriasis, tachyarrhythmias, stroke, and seizure), nutritional, and social changes, with higher susceptibility to HIV and other infectious diseases, any of which can markedly affect the general and oral health of the individual user. Abusers feel little interest in seeking medical or dental treatment other than as a possible mechanism for obtaining prescription drugs of abuse with a consequent decrease in the quality of life. The main categories of drugs involved in abuse include opiates, cannabis, hallucinogens, cocaine- and amphetamine-type stimulants, various "club" drugs, alcohol abuse and heavy smoking. The physical harm caused by a drug needs to be considered in terms of its acute toxicity, as well as its likelihood to produce long-term general and oral health problems. The mouth of a patient who is under prison of drug/substance abuse shows a clinical presentation of generalized caries, periodontal disease, mucosal dysplasia, xerostomia, tooth wear and tooth loss with subsequent other pathological changes. Dentists can play a crucial role in the early detection of abuse by noticing such oral changes and can facilitate the restoration of the health status of a sufferer. All professionals are strongly encouraged to collaborate in providing patient education, referral to treatment centers and to offer appropriate dental care. This paper

is written with aim to evaluate general oral manifestations of some commonly used drugs- methamphetamine, heroin, cocaine, cannabis, alcohol etc. It will make the general and dental practitioner aware of the many general and oral adverse effects which are shown by continuous usage of certain illegal drugs. It will also review what precautions or changes to routine treatment might be necessary in such individuals.⁽¹⁻³⁾

Definitions: The following definitions are important to know-

Addiction- physical and psychologic dependency, associated with tolerance to a drug and withdrawal symptoms with a persistent disposition to relapse to drug use after abstinence has been achieved and physical dependency reversed (Newman, 1983).^(1,4)

Abuse- a pattern of pathologic behavior associated with continued use of a drug or drugs despite persistent social, psychologic, or physical problems caused by drug use (Friedlander and Mills, 1985).^(1,5)

Withdrawal- psychological or physiological symptoms developed following discontinuance of drug use (Rosenbaum, 1981; Friedlander and Mills, 1985).^(1,5)

Common and specific drugs of abuse- worldwide discussed in this paper include cannabis, Methamphetamines, cocaine, heroin and ethyl alcohol.

Cannabis: Cannabis is a drug of plant origin consisting of chemicals known as cannabinoids which is present in stalks, leaves, flowers and seeds of plants. Pharmacology of most of cannabinoids is not clear but the most common, studied, synthesized and potent psychoactive agent inducing relaxation and heighten the senses is delta-9-tetrahydrocannabinol (THC). Marijuana, hash, and hashoil are the three forms of

cannabis which are commonly used by drug abusers among which marijuana is on top of list. It is reported that approximately 60% of Americans have experimented with the drug and estimated 20 million use marijuana regularly by smoking it as a cigarette or in a pipe. Cannabis almost affects every part of human body. Most commonly it produces euphoriant effect or "high" inducing feeling of decreased anxiety, alertness, tension, depression and increased sociability within minutes and lasts for minimum two hours. Dose related tachycardia, widespread vasodilation, postural hypotension, fainting, bronchial irritation, emphysema, bronchogenic carcinoma, immunosuppressant, reproductive risks in females are common effects of the drug with reddening of conjunctiva as characteristic diagnostic feature of cannabis abuse.^[1,4,6]

Among oral effects are fiery-red gingivitis, gingival leukoplakia, alveolar bone loss, gingival inflammation, oral papillomas, uvulitis, tongue carcinoma, reduced salivation, and an increased risk of dental caries. Gingival enlargement resembling phenytoin induced gingival hyperplasia has been reported in conjunction with heavy cannabis use. The cannabis users should be instructed to cease its use for at least one week prior to dental treatment and alcohol-containing mouth rinses should not be prescribed as xerostomia is one of the oral manifestations of cannabis usage.^(1,4,7)

Methamphetamines: Methamphetamine (MA) commonly known by the names like ice, chalk, meth, speed, fire, crystal, glass, is highly addictive central nervous stimulant, the effects of which are longer lasting and more harmful to the central nervous system as compared with those of amphetamine and is most popular among abusers specially youth due to its relatively low cost and its long "high" period of 8-12 hours of enhanced well-being, increased energy and enhanced libido. This drug is usually swallowed or injected intravenously, but one solid form, d-methamphetamine (ice, crystal), can be smoked.^(3,8,9)

Common adverse effects include tachycardia, hypertension, more prone to myocardial infarction, cerebrovascular accidents and hyperthermia. MA use may precipitate a range of psychiatric symptoms including depression, insomnia, anxiety, chest pain, headaches, or seizures, self-inflicted skin lesions in the context of psychotic symptoms, transmission of hepatitis and HIV via needle sharing and even some cases of systemic vasculitis and liver failure are also reported. "Meth- Mouth" is the condition of oral cavity of methamphetamine abusers where different kind of rampant caries (caries on buccal and cervical smooth tooth surfaces and proximal surfaces of the anterior teeth) are seen and patient usually complains of "blackened, stained, rotting, crumbling or falling apart". Along with this kind of caries severe tooth loss, xerostomia, clenching, temporomandibular disorders, tooth sensitivity and compromised oral hygiene are also

seen in methamphetamine abusers. In dental consideration dentists should use local anesthetic without vasoconstrictor in such patients.^(3,8,9)

Cocaine: A central nervous stimulant cocaine and crack-cocaine is an ancient drug which is hydrochloride salt extract of coca leaf which was apparently chewed for its euphoric effect and was also used in religious ceremonies in India and had medicinal value because of its local anesthetic effect. It is available in market majority in Peru and Bolivia as white crystalline powder, which can be taken orally, intra-nasally, vaginally, rectally, or injected subcutaneously or intravenously. Drug dealers sell it by street names including nose candy, snow, coke, c, blow, and toot.^(1,10)

Illegal and illicit use of cocaine results in severe psychopathologic effects such as delirium, paranoia, anxiety or depression, schizophrenia, or mania known as "cocaine psychosis". Anxiety, convulsions, hypertension, cardiac erythema, elevated body temperature, myocardial ischemia, infarction, and death are the outcomes of cocaine abuse. Withdrawal symptoms include severe depression mixed with irritability. When cocaine is used through intranasal route snorting results into nasal septum ulceration and perforation, altered sense of smell, chronic sinusitis, sneezing, sniffing, rhinitis and perforation of the palate. During oral usage it results in gingival laceration and recession. Cocaine powder reduces saliva pH which results in increased tooth erosion and caries. Oral candidal infections, headaches, xerostomia, angular cheilitis, halitosis, glossodynia, erosive lichen planus, burns and sores on lips and face and also inside mouth which increase chances of HIV transmission are also reported in literature.^(3,10,11)

Heroin: Heroin is a most commonly abused semisynthetic opiate which can be injected, snorted, sniffed, or smoked. It is prepared by extraction from the poppy (*Papaver somniferum*) as morphine, then acetylated to diacetylmorphine (heroin). It is used in diluted form after dilution with agents like quinine, powdered milk, lactose, mannitol, baking soda etc. when intravenous injections are given euphoric state is achieved within 6-8 seconds.^(1,2,12)

Overdose, infective endocarditis, respiratory depression, pulmonary emboli, fibrosis, and hepatitis or other liver disorders are common complications seen in heroin abusers. Overdose leads to respiratory depression, coma, hypotension, and bradycardia. Withdrawal features include severe agitation, but withdrawal is not considered life threatening. Heroin abusers show intense craving for sweets which might result in increased rate of dental caries (darker and usually limited to buccal and labial surfaces which is pathognomonic for heroin abuse), and poor oral hygiene. Other oral complications include bruxism, candidosis, oral viral infections, hyperpigmentation of the tongue necrotizing gingivitis, adult periodontitis and

anxiety towards dental consultation and treatment. As main oral problem is dental caries which emphasize that oral physicians should be aware of it and should indulge the patients in more frequent recall appointments and constant reinforcements of oral hygiene.^(2,3,12,13)

Ethyl Alcohol: Alcoholism has been defined by World Health Organization as “a term of long-standing use and variable meaning, generally taken to refer to chronic continual drinking or periodic consumption of alcohol which is characterized by impaired control over drinking, frequent episodes of intoxication, and preoccupation with alcohol and the use of alcohol despite adverse consequences”. Though ethyl alcohol is not an illicit drug but it is used as mood altering substance by people who are prone to illicit drugs use. Ethyl alcohol has central nervous system depressant and has a transient stimulatory effect.^(1,14)

Liver enzymes such as alkaline phosphatase, aspartate aminotransferase (AST), alanine aminotransferase (ALT), and gamma glutamyl transferase (GGT) may be elevated in chronic alcoholism cases suggestive of liver disease like hepatitis, liver cirrhosis, liver failure. Other systemic complications in chronic alcoholics include esophagitis, oesophageal cancer, problems with cognition and memory, optic nerve damage, irregular heart rhythms, hypertension, strokes, pneumonia, increased susceptibility to tuberculosis, impotence, infertility, depression, violence, psychosis, memory loss, and illusions. Chronic drinkers shows asymptomatic enlargement of salivary glands specially parotid glands (Sialadinosis) resulting in decreased salivary function and thus salivary secretion consequently leading to xerostomia and reduced salivary buffering capacity which altogether results in dental decay. Alcohol abuse can lead to irritation to gingival tissue which synergism with reduced salivary secretion resulting in chronic periodontal diseases. Wasting disease commonly erosion is seen in alcohol users as ethanol results in direct and indirect degradation rate of organic system and acidic dissolution of tooth surface enamel. Alcohol along with tobacco consumption increases the risk of oral cancer development as dehydrating effect of alcohol on cell walls enhances mucosal permeability to other toxins and carcinogens.⁽¹⁴⁻¹⁶⁾

Barriers and challenges in health promotion among drug abusers:^(2,17)

- a. Cooperation by drug abusers in long-term follow-up is common challenge in health promotion among them.
- b. Due to multifactorial and complex nature of drug abuse it is difficult to identify the independent effects of each group of drugs.
- c. Addicts usually show anxiety in seeking dental treatment or show unwillingness for non-emergency dental care.

- d. Poor collaboration between dental and general health care sectors.

Conclusion

Drug abuse has many damaging consequences by causing harm both acutely and chronically to not only for the individual and family members, but is also threat for the society as a whole. Dentists should always discuss with the patient his or her history of drug abuse and can play a crucial role in the early detection of drug abuse and can participate in restoring the general and oral health status of abusers. Regardless of the barriers and challenges all professionals are strongly encouraged to provide patient education, collaboration with general health sector, referral to de-addiction treatment centers and to offer appropriate dental care, thus help victims in regaining their self-esteem and may also improve their quality of life.

References

1. Rees T.D. Oral Effects of Drug Abuse. *Critical Reviews in Oral Biology and Medicine* 1992;3(3):163-84.
2. Shekarchizadeh et al. Oral Health of Drug Abusers: A Review of Health Effects and Care. *Iranian J Publ Health* 2013;42(9):929-40.
3. Maloney W. The Significance Of Illicit Drug Use To Dental Practice. *Web med Central Dentistry, Drug Abuse* 2010;1(7):WMC00455.
4. Newman R. G. The need to redefine "addiction". *N Engl J Med* 1983;308:1096-8.
5. Friedlander A. H. and M. J. Mills: The dental management of the drug-dependent patient. *Oral Surg. Oral Med Oral Pathol* 1985;60:489-92.
6. Grotenhermen F. Pharmacokinetics and pharmacodynamics of cannabinoids. *Clin Pharmacokinet* 2003;42(4):327-60.
7. Versteeg PA, Slot DE, van der Velden U, van der Weijden GA. Effect of cannabis usage on the oral environment: A review. *Int J Dent Hygiene* 2008;6:315-32.
8. Mooney L.J, Casey P.M, Hillhouse M et al. Health conditions in methamphetamine-dependent adults 3 years after treatment. *J Addict Med* 2009;3:155-16.
9. Donaldson M, Goodchild JH. Oral health of the methamphetamine abuser (published correction appears in *Am J Health Syst Pharm* 2006;63(22):2180). *Am J Health Syst Pharm* 2006;63(21):2078-82.
10. Lee, C. Y. S., H. Mohammadi, and R. A. Dixon: Medical and dental implications of cocaine abuse. *J. Oral Maxillofac Surg* 1991;49:290-3.
11. Blanksma CJ, Brand HS (2005). Cocaine abuse: orofacial manifestations and implications for dental treatment. *Int Dent J* 2005;55(6):365-9.
12. The Medical Letter, Inc.: Acute reactions to drugs of abuse, *Med. Leu. Drugs Therapeut* 1990;32(828):91-4.
13. Picozzi A, Dworkin SF, Leeds JG, Nash J. Dental and associated attitudinal aspects of heroin addiction: a pilot study. *J Dent Res*, 1972;51(3):869.
14. Khairnar MR, Wadgave U, Khairnar SM. Effect of Alcoholism on Oral Health: A Review. *J Alcohol Drug Depend* 2017;5(3):266.
15. Larato DC. Oral tissue changes in the chronic alcoholic. *J Periodontol* 1972;43:772-3.
16. Lages EJ, Costa FO, Cortelli SC, Cortelli JR, Cota LO, et al. Alcohol Consumption and Periodontitis:

- Quantification of Periodontal Pathogens and Cytokines. *J Periodontol* 2015;86:1058-68.
17. Robinson PG, Acquah S, Gibson B. Drug users: oral health-related attitudes and behaviours. *Br Dent J* 2005;198(4):219-24.