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Review Article

Oral Health Negligence in Alcohol Consumers: A Review

Rohan Sachdev¹, Kriti Garg²

¹BDS Student, Rama Dental College, Hospital & Research Centre, Kanpur, U.P., India

²Reader, Dept of Oral Medicine & Radiology, Rama Dental College, Hospital & Research Centre, Kanpur, U.P., India

ABSTRACT

Chronic consumption of alcoholic beverages is an accepted social custom worldwide. Heavy consumption of alcohol, particularly in conjunction with smoking, is an important risk factor for oral cancer. Alcohol misuse is a common problem in all communities. Alcohol consumption may lead various health problems including oral health which may lead to caries, plaque accumulation, and periodontal conditions in all age and sex people. Oral health of alcoholics and substance abusers is often neglected; in that scenario dental health care professional's plays very important role to improve oral health and further provide prevention of other oral and systemic diseases.

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Corresponding Author: Dr.Kriti Garg, 117/K-68 Sarvodaya Nagar, Kanpur 208025, UP, India

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INTRODUCTION

After caffeine, alcohol is the second most commonly consumed drug worldwide.¹ The term "alcohol" as used in medicine typically is applied to ethanol, rather than other alcohols. Ethanol (CH₃CH₂OH) is the active ingredient in alcoholic beverages.² According to the World Health Organization there are almost two billion people worldwide who consume alcohol on a regular basis. It's a common abuse and almost 80 million are diagnosed with 'alcohol abuse disorders' (WHO 2002, 2004). While moderate alcohol consumption can be part of a healthy lifestyle, alcohol isn't considered healthy. Part of its mixed reputation comes from both the short- and long-term effects on the human body and health, from brain to blood sugar, to liver.³ Excessive alcohol consumption is related to more than 60 different medical conditions, as suicide, homicide and different forms of accidents.² Some conditions are acute, while other conditions such as liver cirrhosis, chronic pancreatitis, hemorrhagic stroke and various forms of cancer, are chronic consequences.² In addition to the chronic diseases that may develop in those who drink large quantity of alcohol over a number of years, alcohol use also results in development of various dental diseases.⁴ Alcohol

may adversely affect salivary glands which in turn may lead to tooth decay. Alcohol can cause irritation and inflammation of oral soft tissues, including gingival tissues, tongue, etc. Non carious destructions of teeth like dental erosions are also related to regular alcohol drinking.⁴ Oral health of alcoholics and substance abusers is often neglected. Dental practitioners should provide adequate treatment to oral health and conditions and also provide proper knowledge of alcohol misuse.

Alcohol consumption

For years now, we have become familiar with health warnings about excessive alcohol consumption and its negative effects on the body.⁵ 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".⁴ An alcoholic is an individual who is obsessed with alcohol and cannot have control over alcohol consumption. Alcoholism is at least twice as

prevalent in men as it is in women, although more common in males. According to a national survey, the lifetime prevalence was 20% in men and 8% in women.⁶ An alcoholic consumes alcohol for a longer period of time which leads to development of addiction which may lead to development of behavioral disorders and may have detrimental effect on mental and physical health.⁴ Excessive alcohol consumption causes problems not only to individuals, but to their families, communities and society as a whole.⁷

Effects of alcohol consumption on body health

Alcohol is generally a socially accepted drug and it is nonetheless, a drug which impairs the capacity to reason and alters coordination with the potential to cause unconsciousness. Alcohol is absorbed from the stomach into the blood stream and affects the central nervous system.⁸ Prolonged use of alcohol affects the entire body. It can cause malnutrition, anemia, fatty liver, inflamed liver, stomach disease, ulcers, memory loss, enlarged heart, hypertension, suicide, fetal alcohol syndrome, and domestic violence. It also has numerous social complications.^{7,9} Alcohol addiction can have serious impact on health of an individual and may cause various physical effects include:⁴

- Gastro-intestinal system: Nausea, vomiting, esophagitis, can also cause gastritis, hepatitis, liver cirrhosis and pancreatitis; impact on teeth, gingival tissue and oral mucosa can also be seen.
- Central nervous system: Brain cells death, harm to peripheral nerves; problems with cognition and memory; injury to optic nerve, neuropathies etc.
- Cardiovascular system: Light-to-moderate drinking can be beneficial, but heavy alcohol drinkers suffer from Cardiovascular System damage such as cardiac muscle disorders, irregular heart rhythms, hypertension and strokes.
- Skin: Bluish color of the face skin lesions like pellagra, psoriasis, discoid eczema and superficial infections are more common in heavy drinkers.
- Respiratory system: Alcohol abuse causes significant derangements in the lung and predisposes individuals to the development of pneumonia and acute lung injury; increased risk of tuberculosis.
- Reproductive system: Impotence, infertility, and reduced male secondary sexual characteristics in males; the reduction in fertility, difficulties in pregnancy and during childbirth or spontaneous abortion.
- Mental disorders like depression, violence, psychosis, memory loss, and illusions.

Effects of alcohol consumption on oral health

Alcohol consumption and oral health share a cause-and-effect relationship, with alcohol serving as the catalyst for the development of many diseases that affect oral health.⁵

Chronic alcoholics may neglect themselves as they are preoccupied with their addiction and often they may have poor dental hygiene.² Alcohol addiction not only affects health of the entire body but also the oral health of an individual. Alcoholics are at high risk of developing dental caries, gingival diseases and may suffer from oropharyngeal cancers.⁴ Alcohol consumption in small or large amount can have diverse effects on oral health of an individual due to negligence and may cause numerous oral conditions:

- Teeth structure: Consuming multiple alcoholic beverages within a short period of time, damaged enamel of teeth and lead to tooth decay.⁵ People who have alcohol use disorder tend to have higher plaque levels on their teeth and are three times as likely to experience permanent tooth loss.³ Alcoholics generally have a high incidence of decayed teeth which leads to either extraction of teeth or restoration of teeth. Alcoholics may suffer from more number of missing teeth, active carious lesions and more number of endodontically treated teeth as compared to non-alcoholics. These alcoholics had a permanent tooth loss three times higher than the non-alcoholics of corresponding ages.^{2,4}

Tooth erosion is a common disease and is occurs as a result of constant vomiting and food refluxing into the mouth,⁹ the pH of most alcoholic beverages is acidic, with values around pH 4,0 and the concentration of organic and inorganic acids is high which further leads to tooth decay.^{2,4} Regular and prolonged consumption of acidic drinks such as wine makes oral cavity as well as the teeth surface acidic in nature. This acidification dissolves surface enamel and makes teeth surfaces more vulnerable to mechanical damage due to tooth-brushing, teeth clenching, etc. Most commonly affected tooth surfaces due to erosion are palatal surfaces of upper teeth followed by occlusal surfaces of posterior teeth. The lower teeth and buccal surfaces of the upper teeth are least affected by erosion.^{2,4} Alcohol consumption also causes staining of teeth in long term. Chromogens attach to tooth enamel that's been compromised by the acid in alcohol, staining of teeth may be visible.³

- Salivary glands: The salivary glands, mainly parotid glands, may become swollen in long term alcohol consumers, and it is known as sialadenosis which is associated with ethanol induced peripheral neuropathy. This condition results in disturbances in the metabolism and excretion of the salivary glands. Reduced salivary secretion along with diminished buffering capacity and less attention to oral hygiene may lead to increased risk of dental caries and gingival disease.⁴

- Dry mouth: Chronic alcoholics may suffer from dryness of mouth or less saliva due to acidic nature of alcohol. The sublingual gland showed a proportional increase in adiposity and reduction in fibrovascular tissues. Reduction in parotid salivary flow rate may be associated with chronic consumption of alcohols which may in turn increase the risk of caries in alcohol and substance abusers.^{2,3}
- Periodontal condition: Inflammation of periodontal tissues or gum disease, results from bacterial growth in the mouth. Sugars in alcohol help these bacteria to grow and irritate gingival tissue— leading to bleeding, swelling and bad breath among other symptoms. As periodontitis progresses, it can lead to loosened gum tissue and tooth loss.⁵ Prolonged alcohol drinking is associated with multiple systemic effects which can worsen the oral health. Age, low income, low education level, smoking and alcohol abuse are high risk markers for periodontal destruction.² Alcohol abuse can lead to periodontal disease for a number of reasons including: irritation to gingival tissue; poor oral hygiene habits among chronic alcohol drinkers; poor eating habits resulting in nutritional deficiencies leading to poor immunity; poor immune response to penetrating harmful chemicals; dehydration from alcohol consumption causes bacteria and plaque build-up as they are not washed away by saliva; ignorance of early symptoms of gingival diseases resulting in progression of diseases to more serious condition leading to periodontal diseases. Alcoholics have severe risk of developing chronic generalized periodontitis associated with gingival inflammation, blunting of the interdental papillae and deep pockets with related bone loss. Alcoholic men suffer more frequently from horizontal bone loss and calculus as compared to women.^{2,4}
- Tongue: Alcohol dries the mouth and can even dehydrate the entire body. The drying effects of alcohol can result in white tongue, black hairy tongue.⁵ Alcoholics may suffer from changed taste sensation, most commonly a metallic taste. Besides direct harmful effects on oral health, alcoholics suffer from a number of indirect effects which manifest as a result of lack of adequate nutrition. The most common effects are tongue inflammation (glossitis), inflammation of corner of mouth (angular cheilitis). Early stages of glossitis show painful and smooth tongue, but sometimes show swollen fungiform papillae. While in later stages, tongue suffers from burning sensation and becomes intensely red followed by atrophy of filiform and fungiform papillae.⁴
- Oral cancer: There is a large body of evidence that alcohol is a major risk factor for oral cancer. It has been estimated that 3.6% of all cancers worldwide, and over 30% of all cases of oralpharyngeal cancer, are attributable to alcohol consumption.^{1,8} Alcohol when it is consumed along with tobacco increases the risk because of synergistic interaction. However, certain mechanisms have been proposed which explain carcinogenic effects of alcohol in pathogenesis of oral cancer, which are:⁴
 - Dehydrating effect of alcohol on cell walls enhances mucosal permeability to other toxins and carcinogens.
 - Change in mucosal morphology with a reduction in epithelial thickness.
 - Metabolism of ethanol produces acetaldehyde which causes damages DNA of oral epithelial cells and oncogene expression of oral keratinocytes.
 - Ethanol disrupts salivary gland function by reducing secretion of epidermal growth factor which protects oral mucosa from injuries caused due to acids which results in increase in the risk of oral mucosal ulcerations.
 - Nutritional deficiencies associated with heavy drinking can lower the body's natural ability to use antioxidants to prevent the formation of cancers.
- Other harmful effects: Tooth damage related to alcohol is increased if you chew the ice in your drinks, which can break your teeth.³ Temporomandibular joint disorders, which display indicative pain in the ears and problems chewing, usually result from night time teeth grinding, as a result of alcohol's effect on the part of the brain that helps with sleep.^{9,10} Alcohol consumption increases the risk of dental and maxillo-facial trauma, almost 55% of injuries by assault were associated with alcohol consumption, 11% for falls and 15% for people injured in road traffic accidents.^{1,9,10} Alcoholism results in a deficiency of folate and other B complex vitamins (niacin, pyridoxine, riboflavin and thiamine), they may affect the mouth drastically. Alcohol consumer may develop a sore mouth, recurrent ulcers, swollen tongue, altered taste, smooth tongue; tingling in and around the mouth and angular stomatitis. In addition, the salivary glands that are found immediately in front of the ears, on both sides of the face, commonly become swollen because of fat deposits and can be a distinguishing facial feature of those persons who drink heavily.⁹ Heavy alcohol drinking in particular, may influence the oral microbiome composition, which can also cause various diseases in oral cavity.¹¹

CONCLUSION

No part of the body is left unaffected and the mouth is no exception. High alcohol consumption has a deep impact on oral health. Some systemic alcohol-related conditions may indirectly affect oral health. The side effects of heavy drinking are also risks of developing cancer of the oral

mucosa, which is also in higher proportions among alcoholics. The dangers may increase due to the use of alcohol-containing mouthwashes and mouthrinses. The high concentration of organic and inorganic acids and the habit of keeping the alcoholic drink in the mouth can cause chronic inflammations of the soft tissues and can increase the negative side effects from metals of crowns, bridges, orthodontic devices and various metal restorations. The dental professional has many things to consider when managing the alcoholic patient and will ensure the patient receives the best management depending on the patient's health status. It is necessary for the dentist to get a complete picture of the alcoholic's health status before performing any procedures. Therefore, when the dental professional asks about drinking habits, he is not being nosy, but is ensuring that the patient receives the best care possible. Education of alcohol-dependent individuals in a rehabilitation setting may contribute to their attention to oral health and willingness to change habits.

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