

## The Effects of Alcohol Consumption on Oral Health: A Review

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### Abstract

The abuse of alcohol is on the rise and has been found to be associated with numerous systemic diseases. In addition to this, alcohol has been implicated in adversely affecting the oral cavity and can cause salivary gland diseases, oral cancer, potentially malignant disorders of the oral cavity, dental caries, erosion of teeth, periodontitis and oral mucosal alterations. This review focuses on the oral implications of chronic and excessive alcohol consumption.

**Keywords:** Alcohol; Cancer; Periodontitis.

### Introduction

Alcoholic beverages are consumed worldwide as a part of various recreational and ceremonial activities. A standard drink of alcohol is considered to have 15 grams of alcohol.

Some of the most commonly used alcoholic beverages include wine, beer, rum, whisky, gin, brandy, vodka along with locally brewed alcoholic beverages such as toddy.<sup>1</sup>

The US National Institute on Alcohol Abuse and Alcoholism defines "heavy drinking" as consuming more than four drinks a day or 14 drinks a week for males, and consuming more than three drinks a day or seven drinks a week for females.<sup>2</sup>

Alcoholism has been defined by the 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."<sup>3</sup>

Excessive consumption will lead to a state of dependence and is associated with a withdrawal syndrome.<sup>4</sup>

Alcohol abuse is on the rise and has been linked to numerous diseases. Alcohol use disorders continue to be an alarming health issue globally and it has been attributed to 2.5 million deaths per year worldwide.<sup>5</sup>

Although the consumption of moderate amounts of alcohol has been proven to have some beneficial effects, the risks associated with alcohol use especially in teenagers and adolescents definitely outweigh any benefit which may occur at a later point in life.<sup>6</sup>

The consumption of high amounts of alcohol can predispose an individual to cardiovascular diseases, liver cirrhosis, cancer, trauma, diabetes, pancreatitis, gastrointestinal complications such as haemorrhagic gastritis, cerebrovascular diseases like stroke, neurological complications such as alcoholic tremors, cerebellar degeneration, encephalopathy, impaired memory and mental disorders.<sup>6,1</sup>

In addition to this, heavy drinkers experience a numerous array of social harms which include family disruption, criminal convictions, unemployment and financial problems.<sup>7</sup>

The consumption of alcohol has been proven to adversely affect not only the systemic health but also the oral health of an individual. This review highlights the oral effects of excessive alcohol consumption.

### **Oral Manifestations**

#### *Salivary Glands*

Long term alcohol consumption may cause a condition called Sialadenosis which is characterized by non-neoplastic, non-inflammatory enlargement of the salivary glands. This is due to peripheral neuropathy induced by ethanol causing disturbances in the excretion and metabolism of the salivary glands. Xerostomia may also occur.<sup>8</sup>

Salivary pH levels are reduced due to the acidic nature of alcohol thereby increasing the prevalence of caries.<sup>3</sup>

#### *Teeth*

A fall in salivary pH along with other factors such as a dry mouth can predispose the patient to the development of dental caries.<sup>3</sup> Since alcohol is acidic, the surface enamel can undergo erosion. It also makes the teeth more vulnerable to mechanical injuries from oral hygiene practices. Alcohol also relaxes the lower esophageal sphincter which results in frequent vomiting leading to tooth erosion.<sup>3,9</sup>

#### *Periodontium*

Alcohol can cause irritation of the gingival tissues. This along with other factors such as poor nutrition and dietary habits, poor oral hygiene, dehydration caused by alcohol intake resulting in bacterial colonization and plaque formation and poor immunity all contribute to the development of periodontal diseases.<sup>3,9</sup>

#### *Oral Cancer*

Alcohol has a dehydrating effect on the oral cells which increases the permeability allowing carcinogens to penetrate freely. The metabolism of ethanol results in the production of acetaldehyde which has been known to cause DNA damage.<sup>10,11</sup>

The body's natural ability to utilize antioxidants to fight cancer may be impaired as a result of the nutritional deficiencies associated with excessive alcohol consumption.<sup>3</sup> Studies show that those who

consume alcohol four or more times a day were five times more likely to develop oral cancer than teetotalers or those who rarely consumed alcohol.<sup>9</sup>

#### *Tongue*

Glossitis of the tongue with associated angular cheilitis may occur as a result of alcohol consumption and secondarily due to associated nutritional deficiencies.<sup>9</sup> Acute ethanol exposure has been linked to increasing the GABAergic transmission resulting in tremors of the tongue. Tremors can also be a sign of alcohol withdrawal.<sup>12</sup>

#### *Leukoplakia*

WHO defined leukoplakia in 2005 as - "a white plaque of questionable risk having excluded (other) known diseases or disorders that carry no increased risk for cancer."<sup>13</sup>

It is the most commonly occurring potentially malignant disorder.<sup>14</sup> Studies have shown that alcohol, spirits and wine are significantly associated with the development of leukoplakia. Chronic alcohol consumption is often associated with nutritional deficiencies. Vitamin A deficiency can also contribute to the occurrence of oral leukoplakia due to increased amount of keratinization.<sup>15</sup>

#### *Erythroplakia*

According to WHO, Erythroplakia is defined as any lesion of the oral mucosa that presents as bright red velvety plaques which cannot be characterized clinically or pathologically as any other recognizable condition.<sup>16</sup> It is a potentially malignant disorder. Studies show that chronic alcohol consumption is a risk factor in the development of oral erythroplakia.<sup>17,3</sup>

### **Conclusion**

It is a well established fact that chronic and excessive alcohol consumption adversely affects systemic and oral health. One of the most important consequences is the development of oral cancer. Dentists have a crucial role in early screening and treatment of alcohol-associated oral changes at the earliest. Dentists also play an important part in identifying patients who abuse alcohol or struggle with addiction and refer them to a deaddiction and counselling centre for appropriate treatment.

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