



## Effect of Gutka on Periodontium

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### Abstract

In India, gutka is one of the most popular smokeless tobacco being consumed by people of different socioeconomic groups, because of its less cost and easy availability. Chewing of gutka has a strong impact on oral hygiene and is also a risk factor for periodontal disease. Gutka chewing causes increased gingival recession and clinical attachment loss. The present review was conducted to assess the effect of gutka chewing on periodontal health

**Keywords:** Smokeless Tobacco; Gutka; Periodontium; Recession; Attachment Loss

### Introduction

Around 40% of tobacco users belong to two most populated countries of the world; China and India [1]. It has been found that there are around 930 million tobacco buyers worldwide, out of which 1.1 billion smokers belong to the developing nations, in which India contributes to a huge number of around 182 million smokers [2]. Thus in India tobacco smoking is becoming a common type of tobacco utilization among both rural and urban populations [3]. World Health Organization (WHO) has estimated that by 2020, in India the death rate related to tobacco consumption will cross around 1.5 million or 13% of deaths [3].

Various forms of Smokeless tobacco (SLT) like gutka, betel quid with tobacco, khaini, zarda, toombak etc., are being used by people of northern and central states of India. They are commonly consumed either by directly placing them in the buccal vestibule or in the side of the cheek or lip and then chewed [4]. Among all, Gutka is the most popular kind of smokeless tobacco. It consists of

areca nut, catechu, and tobacco along with different fixings that is accepted to be increasingly enhanced, addictive and sweetened in nature. It also has a high quantity of nicotine and other additives. Areca nut and tobacco in gutka causes double destructive impacts on its users [5].

People using Smokeless tobacco are at a high risk of cancers affecting lip, oral cavity, tongue, and pancreas. Even the malignancies of the voice box, colon, throat, and bladder, are also observed because of swallowing of toxins and poisonous substances in the juice of smokeless tobacco [6]. Smokeless tobacco can cause periodontal diseases, dental caries, staining, attrition of teeth etc [7].

Periodontitis is the inflammatory disease of tooth supporting structure or periodontium. It causes destruction of supporting structures of tooth by releasing different host-mediated inflammatory mediators and tissue-destructive enzymes [8]. The two most common inflammatory mediators are interleukin-1 $\beta$  (IL-1 $\beta$ ) and IL-8 that have been implicated in gingival and periodontal inflam-

matory diseases. In gutka chewers, assessment of levels of interleukin helps to assess the local status of the periodontium [9]. The present review was conducted to assess the effect of gutka chewing on periodontal health.

### Constituents in gutka

In India, Gutka chewing is one of the most popular form of chewable tobacco, being used with a prevalence rate of around 57.6% [10]. The common smokeless tobacco products used in India are gutkha and pan masala (consisting of powdered tobacco mixed with areca nut, slaked lime, and catechu), betel quid with tobacco, zarda (made by boiling the pieces of tobacco leaves in water with slaked lime), khaini (consisting of tobacco with slaked lime), and mawa (a mixture of areca nut, tobacco, and slaked lime) [11]. Different Smokeless tobacco products have variation in their preparation, composition, and toxicity. They have difference in their chemical constituents like nitrosamine acids, nicotine, tobacco-specific N-nitrosamines (TSNA), polycyclic aromatic hydrocarbons (PAHs), aldehydes, and heavy metals [12].

Gutka is the generic name for a chewable form of smokeless tobacco. It is a mixture of various substances; powdered tobacco, areca nut, slaked lime (aqueous calcium hydroxide), menthol, catechu, perfumery compounds such as sandalwood and musk ketones, and certain sweetening and flavoring agents [10]. Areca nut, classified as Group I human carcinogen, is a major ingredient of products like gutkha and zarda.

### Periodontium and periodontal diseases

Periodontium is referred to as the supporting structure of the teeth. It consists of four structures; gingiva, periodontal ligament, cementum, and alveolar bone. Various diseases of periodontium consists of a wide variety of inflammatory conditions affecting the supporting structures of the tooth, that can further progress to loss of tooth and leads to various systemic diseases [13].

Periodontitis is defined as the inflammation of periodontium. It is a type of infection with a worldwide prevalence, affecting people of all age groups, but the disease is more prevalent among elders. The increased extent, prevalence and severity of disease in elder age groups shows the collective effect of a prolonged experience to various risk factors. The established risk factors of periodontal diseases are alcohol consumption, systemic conditions like diabetes

mellitus depression, stress, aging, and environmental exposure to cigarette, tobacco smoking, gutka chewing etc [14].

### Effect of gutka on periodontium

Various studies have been conducted to study the role of tobacco and cigarette smoking on periodontal health. Studies by different authors [15-17]. suggested that smoking of cigarette is significantly associated with periodontitis, and even it causes unfavorable response during the treatment of periodontal tissues. The authors revealed that smoke from cigarettes consists of harmful substances like cotinine, nicotine, acetaldehyde, and acrolein that have various damaging effects on the periodontium. They have also advocated that cotinine levels estimated in patients are significantly correlated with progressive periodontal disease [15-17].

In other studies [17-19]. it has been observed that chewing and smoking of tobacco is highly prevalent in Indian population, and this is one of the major factor reported in causing periodontal diseases. They revealed that forms of smokeless tobacco contain catechu, areca nut, and lime that are harmful to oral tissues. They mentioned that use of smokeless tobacco causes various oral manifestations localized at the site of smokeless tobacco placement. These manifestations include gingival recession, changes in gingival blood flow, mucosal lesions, gingival inflammation, and interproximal periodontal attachment loss [17-19].

In India, the tobacco consumption is very high, especially gutka chewing, smoking of bidis in rural areas and cigarette smoking in urban area. Chewable tobacco products like khaini, pan, mawa, gutkha, quimam, and zarda are quite popular [20].

In Indian population, an exponential growth in gutkha consumption has been noticed in past few years, among people of all socioeconomic levels. This might be due to easy availability, convenience to use, and low cost gutkha packets. Increased promotion of gutkha has been noticed among youths, especially of lower economic strata [21].

The association between gutkha (smokeless tobacco) consumption in relation to periodontitis and bone damage has been established. The main reason of the periodontal ailments is poor oral hygiene and tobacco constituents [21]. In a study by [3], the incidence of gingival recession was found to be quite high. The gingival recession can aggravate the reactions that are prompted by ST.

This in turn quicken the process of periodontal breakdown at the site of recession. Mechanical injury caused due to rough texture of gutka over the thin gingival tissues leads to more damaging effects. Nicotine present in gutkha (smokeless tobacco) activate hyperemia in the gingival vasculature, leading to clinical attachment loss [22].

It has also been observed that the nicotine levels in blood are higher in people with habit of gutkha chewing than cigarette smokers. Thus, gutka consumption has more capacity to intensify the periodontal disease. This leads to increased level of furcation involvement and bone damage [3,22].

[23] revealed that arecoline in areca nut can restrain the development of proteins and fibroblasts of periodontal tissues. Similarly, gutkha contains betel nut that can be another harmful constituent responsible for the pathogenesis of periodontal diseases.

Thus, the present review shows a strong association of gutkha consumption and periodontal diseases. Thus, gutkha is one of the important risk factors for the periodontal ailments.

## Conclusion

In contrast to smoking, the effects of oral smokeless tobacco (SLT) like gutka on periodontium are not studied extensively. Our review highlights the need to conduct various clinical trials, prospective research studies to assess the effect of gutka chewing on periodontal tissues. We also propose that more dental awareness camps and programs should be conducted among rural and urban populations of India, so that people can be made aware of the harmful effects of gutka on oral tissues.

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