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CARCINOGENIC IMPACT OF BETEL NUT ON ORAL HEALTH: A COMPREHENSIVE REVIEW

Dr. Rajkumar Sharma[1], Dr. Monika Sharma[2]

[1]Assistant Professor, Department of Shalakya Tantra, Government Ayurveda College, Jaipur.
[2]Assistant Professor, Department of Agad Tantra, Government Ayurveda College, Jaipur.

***Corresponding Author: Dr. Rajkumar Sharma**
Assistant Professor, Department of Shalakya Tantra, Government Ayurveda College, Jaipur.
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ABSTRACT
Chewing betel nuts can lead to a number of health issues, including mouth cancer. Betel nut use is believed to number 600 million, making it the fourth most frequent addiction after alcohol, tobacco, and caffeine. Humans can develop cancer from betel nuts, whether or not they include tobacco. Users of betel nuts had poor periodontal health, poor oral hygiene, and more gingival lesions and gum bleeding. areca nut leaves stimulate the central nervous system, gynaecological diseases, gastrointestinal ailments, and sore throats. The nut has also been employed as an aphrodisiac in Ayurveda. Increased use of betel nuts might result in giddiness, nausea, and unconsciousness, according to Acharya Bhavprakash. People today utilise betel nuts improperly, which raises their risk of developing mouth cancer and poor oral hygiene. The current review emphasises betel nut carcinogenicity, preventative strategies, and scientific support for these claims.

KEYWORDS: Betel nut, Supari, Oral Cancer, Oral sub mucous fibrosis.

INTRODUCTION

Areca belongs to the Palmaceae family and is the nut or fruit of the Areca catechu, also known as the betel nut palm. It is grown in Malaya and Southern India. People from India use supari as a masticator. It can be chewed with or without tobacco, as well as with betel leaves, lime, and catechu. Approximately 600 million people chew betel quid worldwide.[1] According to a poll conducted by the Indian Dental Association (IDA), between 10% and 14% of Mumbai schoolchildren and 70% of college-bound students chew pan masala and gutkha. Chewing betel quid has been linked to an increased risk of pharyngeal and oral malignancies, according to epidemiological research. According to the International Agency for Research on Cancer, betel nut use can cause cancer in people.[2] The properties of betel nuts, according to Ayurveda, include astringent taste (kashaya ras), sweet taste (madhur ras), sheeta virya, katu vipaka, guru (heavy for digestion), and dry nature (ruksha guna). Typically, betel nut is used with pan masala and gutkha.[3] Alkaloids such as arecoline, areceidine, guvacine, and guvacoline, which are mainly carcinogenic, make up the majority of nuts. These younger chewers represent a concerning population for a new oral cancer epidemic because both commercial items containing areca nuts are frequently marketed as mouth fresheners.[4]

2. AIM AND OBJECTIVES

- To evaluate, elaborate and discuss the Chemical composition, Systemic effect, and Prevention of Betel nut chewing**.**
- To evaluate, elaborate and discuss the carcinogenic effect of Betel nut.

3. MATERIAL AND METHOD

Information on betel nut is gathered from modern medicine textbooks and Ayurvedic texts, respectively. The Ayurvedic Samhitas' extant comments have also made reference to a number of pertinent sources.

4. Conceptual Study

4.1 What is Betel Nut?

The fruit of the Areca catechu palm tree, betel nut, also known as supari, is indigenous to South Asia and the Pacific Islands. When the fruit is ripe, the husk becomes yellow or orange and the fruit within hardens to a hardness similar to wood, but when the husk is still

green, the nut inside is extremely mushy.[5] It serves as the foundation for the majority of chewed items. In India, Taiwan, and Southeast Asia, areca nut concoctions are made for chewing by combining it with slaked lime and the leaf of the betel vine Piper betel.

4.2 Chemical composition of Betel nut

Carbohydrates, lipids, proteins, crude fibre, polyphenols, alkaloids, and minerals make up the Areca nut. Alkaloids are the most significant chemical ingredients in terms of biology. The current experiment on the main areca alkaloid and its main metabolites was carried out for that reason. The most significant of the pyridine group's alkaloids found in areca nuts is arecoline (0.1–o.5%). There are also arecaidine, guvacine, and isoguvacine. In animals, but not in humans, arecoline has anthelmintic properties. Arecaidine solely has stimulating qualities; at greater doses, it becomes sedative. It has no parasympathetic effects.

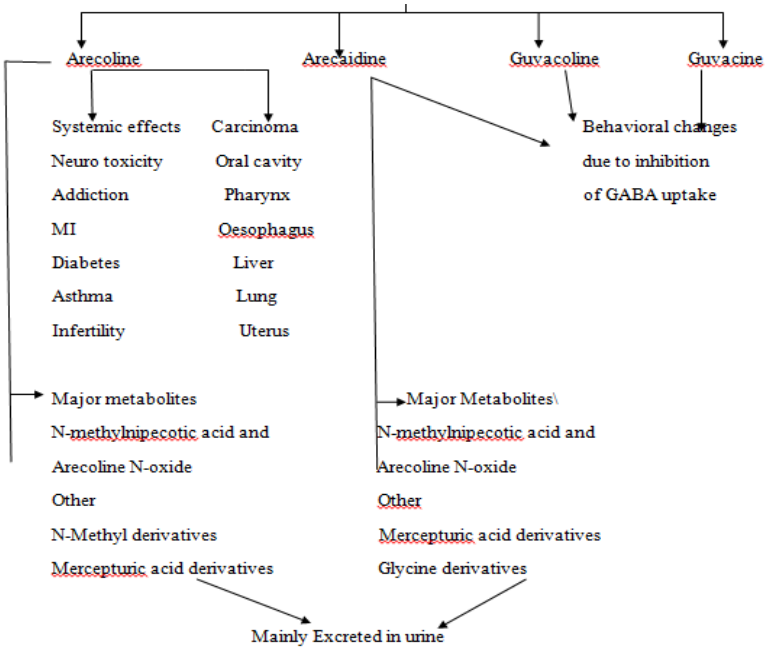
4.3 Sources of betel nut

Its brand names include Vimal Ultra Pan Masala, Shikhar Pan Masala, Shahi Bahar, Leoza Pan Masala, Gokul Supari, Sweet Suapri, kuber Supari, Raga zarda, kuber zarda, panvilas, rajnigandha, and others. Betel nut sources include Pan masala, Gutkha, Supari, Zarda, Khainai, Tamol, and Gudak. Gutkh is made of crushed areca nut, tobacco, paraffin, slaked lime, and a little sweetener.[6]

4.4 Properties of Betel Nut

***Rasa* (Taste)**-*Kashaya*(Astringent), *Madhura*(Sweet)
***Guna*(Qualities)**-*Guru*(Heavy for digestion), *Ruksha*(Dry in nature)
Vipaka-*Katu*(Undergoes pungent taste after digestion)
***Veerya*(Potency)**-*Sheeta*(Cold)
***Karma* (Action)**-*Kapha pitta shamaka*(reduces vitiated *kapha* and *pitta dosha* mitigate *Kapha* and *Pitta*, produces intoxication, enhances digestive power and taste and wards off bad taste in the mouth.[7]

4.5 Systemic effect of areca nut[8]

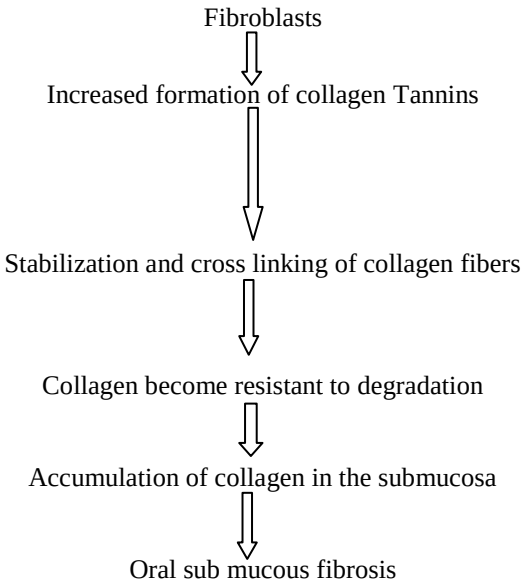


Ten percent of the world's population frequently chews supari in one form or another, making it the fourth most popular addition. Betel nuts contain a particular alkaloid called GABA, which has a broad range of effects on the body, including the brain, intestines, lungs, and pancreas. Its alkaloids, which have been shown to cause cancer in animals by causing tumours in the upper and foregut, are also linked to an increased risk of tumours in humans.[9] Ayurveda claims that the properties of betel nuts include *katu vipaka*, *sheeta veerya*, *ruksha* property, Madhura Ras, and Kashaya.

A number of illnesses, including obesity, diabetes, lethargy, elevated cholesterol, choking sensations, difficulty speaking, constipation, and more, can result from excessive usage of Madhur and Kashaya rasas. Oral cancer and body emaciation can result from long-term betel nut intake.

4.7Carcinogenic effect of betel nut chewing

Areca nut
⇩
Alkaloids
⇩



Flow chart -2 -Role of areca nut in Oral sub mucous fibrosis.[10]

Overuse of betel nut has been shown to have a serious negative impact on human health. Supari (betel nut) products, including those that do not include tobacco, are linked to a higher risk of developing oral squamous cell carcinoma (OSCC), according to sufficient data. In the early stages of OSF, inflammation and hypervascularity are evident as a marble-like appearance.[11]

4.8 Prevention of betel nut Chewing

Oral Cancer management Policies Every nation should develop a "well-managed" national oral cancer management program. The development of effective oral cancer prevention, health promotion, and education strategies and policies should be supported by longitudinal monitoring as well as quantitative and qualitative data on population behaviour, lifestyle, sociocultural background, and economic status. To give leads for the control of mouth cancer, for instance, the Regional Cancer Centre in Trivandrum, Kerala, India, maintains a thorough oral cancer research program. Such a program ought to be implemented as a national initiative. The information from every facility that performs cancer treatment should be used to create a cancer registry. Establishing monitoring and evaluation mechanisms in addition to a data management system is crucial. In order to alter the lifestyle and behaviour of the high-risk group, oral cancer control methods should consider environmental and cultural aspects.[12]

5. DISCUSSION

Caffeine, nicotine, and betel nut use are the fourth most popular psychoactive substances after alcohol. Although some 600 million people chew supari worldwide, South Asia, Southeast Asia, and a few Pacific Islands are where it is most often used.[13] Most consumers are not aware of the negative consequences of eating areca nuts. To deter such behaviours, efforts should be made to raise public awareness of the health hazards associated with areca nut usage. The most obvious reason of the 30–40% of oral cancer cases documented in India is the widespread use of tobacco products with betel nut.[14] The history, culture, and medicine of supari, or betel nut, are all intriguing. This small seed has numerous facets, ranging from its contentious function in Ayurveda to its symbolic role in rituals. Supari advantages include increased alertness and better digestion, on the one hand. On the other hand, there are serious cautions on the negative effects of supari, which range from addiction to cancer to harm to oral health.

6. CONCLUSION

Around the world, people of all ages utilise the addictive substance areca nut. Both its alkaloids and flavonoids play a key role in the pathogenesis of oral cancer. Treatment is not as good as prevention. It is well-spoken and true in the case of betel nut management. Ayurveda states that *nidan parivarjan* is the main objective of Chikitsa. Therefore, quitting betel nut eating is the mainstay of the treatment. Additionally, it is illegal for anyone younger than eighteen to sell tobacco products. Strict enforcement of such regulations is now required.

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