ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at: www.ijdsir.com
Volume – 6, Issue – 3, June - 2023, Page No. : 183 – 188

Effectiveness of antioxidant therapy as an adjunct in the treatment of recurrent tobacco pouch keratosis

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Citation of this Article: Dr Pragya Tripathi, Dr Preeti Upadhyay, Dr Rashi Adhikari, Dr Ching Nun Siam, "Effectiveness of antioxidant therapy as an adjunct in the treatment of recurrent tobacco pouch keratosis", IJDSIR- June - 2023, Volume – 6, Issue - 3, P. No. 183 – 188.

Type of Publication: Case Report

Conflicts of Interest: Nil

Abstract

Tobacco pouch keratosis are formed due to the chronic placement of smokeless tobacco in the vestibular area of the oral cavity for long hours. Comprehensive treatment of tobacco pouch keratosis includes quitting tobacco and regular follow-up to evaluate improvements. Antioxidant effects of lycopene influence on periodontal health by reducing oxidative stress and decreases markers of inflammation. This case reports on the effectiveness of antioxidant/lycopene as an adjunct therapy in the treatment of tobacco pouch keratosis in a self-motivated patient.

Keywords: Tobacco, Keratosis, Adjunct, Antioxidant therapy, Lycopene.

Introduction

The use of tobacco in developing countries like India is much higher than other countries of the world. According to the GATS 2 survey by WHO it is found that 29.6% men, 12.8% women and 21.4 %of all adults currently use smokeless tobacco products (STP) which is higher than the prevalence of smoking tobacco users (19 % of men, 2% of women and 10.7%).[1] Development of oral cancers are quite common at the site of tobacco placement usually on the vestibule even though its aggressive malignant potential is quite lesser than

smoking tobacco. The main ingredient for dependence on tobacco is Nicotine which is a psychotropic drug.[2] Tobacco quid or snuff regularly results in the progression and development of a white patchy mucosal lesion in the area of placement, commonly known as smokeless tobacco keratosis. Smokeless tobacco keratosis is a condition that causes thick white patches to form on mucosa especially in the vestibule inside the mouth. The appearance of the vestibular mucosa may be wrinkled or leather-like. The patches form where the user snugs the tobacco in mouth. Common sites may include the labial and buccal vestibule. Other names of smokeless tobacco keratosis are tobacco pouch keratosis or snuff dipper's lesion.[3]

Smokeless tobacco usage also leads to the development of various oral and periodontal diseases including gingivitis, periodontitis, caries, halitosis, cervical abrasion, staining of teeth. A spectrum of lesions like leukoplakia, speckled leukoplakia, tobacco pouch keratosis, erythroplakia, squamous cell carcinoma are associated with the use of smokeless tobacco.[4] Lycopene is a highly effective antioxidant and carotenoid which reverses the DNA damage induced by hydrogen peroxide.[5] Lycopene participates in a cascade of chemical reactions, protecting critical cellular biomolecules, including lipids, proteins, and DNA, and believed to reduce the risk of cardiovascular disease, cancer, osteoporosis, and in some cases, even male infertility.[6]

A case report on the effectiveness of antioxidant/lycopene in the treatment of tobacco pouch keratosis associated with smokeless tobacco use is presented here.

Case Report

A 50-year-old male patient visited our outpatient clinic with a chief complain of pain in the lower right and left back tooth region for the past 4 to 5 days. The patient also reported that on self-examination he observed a white-colored patch in his right and left lower vestibule. There was no discomfort reported. His habit history revealed the use of smokeless tobacco since the past 12 years and quit history since the last 2 months. in spite of quitting the habit, the white-colored patch did not resolve or become better as reported by the patient. He reported of keeping it on his right and left lower vestibular area for a span of about 4 hours and spitting out followed by putting fresh one again. The daily consumption was 5 to 6 quid per day. He consumes alcohol occasionally. There was no contributing medical history.

On intraoral examination, a greyish-white plaque was evident on his right vestibule extending from lateral incisor to the first molar [Figure 1] and left lower vestibule extending from lateral incisor to the first molar [Figure 2]. The borders were diffuse. The lesions had an ill-defined borders and periphery of the lesions gradually merges with the surrounding normal mucosa. On palpation, the lesion had a wrinkled, thickened, and corrugated surface texture which do not peel upon scratching. Gingival recession was evident, and his teeth showed tobacco stains and showed generalised attrition and abrasion. There was halitosis due to patients' poor oral hygiene. Based on the history and clinical examination, the lesion was diagnosed as tobacco pouch keratosis in the mandibular buccal vestibules. Patient was advised on tobacco cessation counselling and is currently on follow up.

As a part of comprehensive treatment plan, scaling and root planing was done on the day of the first visit. Oral antioxidant was prescribed with chlorhexidine mouthwash for the maintenance of oral hygiene. The patient was educated about the ill-effects of using

smokeless tobacco, and we advised him to follow-up every week till 1 month and every month thereafter. At the second week follow up (2 weeks), white patchy lesions were lesser in size (Figure 3).

At the end of 3 month follow up, there was complete resolution of the lesion as seen in figure 4. Biopsy was not required since no other any evidence of erythema or ulceration to rule out dysplasia or carcinoma or observable surface alterations were seen.

Discussion

Tobacco pouch keratosis are formed due to the chronic placement of smokeless tobacco placed usually in the vestibular area of the oral cavity for long hours. There are 34 varieties of smokeless tobacco products as described by WHO FCTC and about 20 such products are widely used in India.[7] They may be used alone or used with slaked lime, areca nut, camphor, betel leaf, menthol, spices, herbs, sweeteners, essential oils and various salts.[8]

When the tobacco quid is left for a long period, the STP reacts with saliva and produces juice containing toxic substances which releases even chemical carcinogens. Euphoriant effect produced by nicotine present in tobacco is the main reason for all tobacco users to get addicted to it. Approximately twice the amount of nicotine is absorbed orally than smoking and orally absorbed nicotine stays for much longer in the bloodstream.[9]

On palpation the lesion feels soft and velvety with rough fissured surface texture and on stretching a pouch like structure is evident which is the reason for its name.[10]

Literature reveals that this condition has been established as a risk factor for developing oral carcinoma.[11] However, they are said to have a lower risk of malignant transformation when compared to leukoplakia. Chronic use of smokeless tobacco can result in nicotinic dependence. Further, researchers have proved that use of tobacco during adolescence can disrupt brain circuits and affects cognitive abilities, attention deficits, and psychiatric disorders.[11]

Many carcinogens have been found in smokeless tobacco and the major causative agent being tobacco-specific nitrosamines, and other agents include nitrosamine acids, polycyclic aromatic hydrocarbons, aldehydes, and different types of metals.[12] In addition to the risk of oral cancer, smokeless tobacco has been associated with the development of gingivitis, gingival recession and attachment loss, halitosis, reduction of taste, and abrasion of teeth.[13] However, there was no evidence of taste disturbances in our patient.

Comprehensive treatment of tobacco pouch keratosis includes quitting tobacco and regular follow-up to evaluate improvements. If the patient is not ready to quit, we can suggest the patient to minimise the amount and period of usage or change the site of placement . In around 98% of patients, oral mucosa resumed to normal within 2 to 6 weeks after stopping the habit.[14] A biopsy should be performed if there is any evidence of redness or bleeding to rule out abnormal cell growth. Nicotine replacement therapy such as nicotine gum and nicotine patches can be delivered to such patients which acts as a substitute.[15]Antioxidant effects of lycopene and green tea have been shown to have beneficial effects on periodontal health as it reduces oxidative stress, improves the antioxidant status, and decreases markers of inflammation.[16] Inhibition of plaque formation and reduction in inflammation of gingiva the advantageous property of antioxidants and induction of wound healing in gingival tissues.[17]

Counselling and medication are effective when used by themselves for treating tobacco dependence. All tobacco users should be advised to quit the habit. The risk of

progression of tobacco pouch keratosis should be reduced by asking the patient to quit the habit, advice patient about the harmful effects of STP. Patients should have regular follow-up visits to the dentists for oral examinations. Long term follow up is needed for monitoring of development of new lesions and for their early diagnosis and treatment.

On taking into account the various effects of tobacco use, many states in India have banned the usage of smokeless tobacco. Implementing strict legislations against the use of Smokeless tobacco can be achieved, thus saving lives and reducing health inequalities. This cannot be achieved without effective enforcement, regular monitoring and collaboration between people to share and learn from each other's experiences.

Conclusion

It can be concluded that the adjunct therapy of antioxidants/lycopene in self-motivated patients is essential in the treatment of tobacco pouch keratosis. Dental practitioners have an important role for early detection of tobacco-related oral diseases and conditions. They are significant predisposing factor for malignant transformation, such conditions need proper evaluation and detailed history of use of tobacco and the type used. The tobacco-user patient must be educated about the harmful effects of smoke and smokeless tobacco. The popular preventive strategy acronym 5As i.e., Ask, Advise, Assess, Assist and Arrange should be offered to every tobacco user to help them quit.

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Legend Figures

Fig. 1: Shows a greyish white patch seen in the right labial vestibule.

Figure 2: Shows a greyish white patch seen in the left labial vestibule

Figure 3: Two weeks follow-up

Figure 4: Three month follow up.