Areca Nut Chewing Habit in Preschoolers: Two Rare Case Reports and Literature Review

Deepesh Prajapati¹, Rashmi Nayak², Ullal Anand Nayak³, Priya Jariwala Shah³

ABSTRACT

Areca nut chewing habit is common in adult age group worldwide. However, reports of such cases in children are rare. This paper aims to present two cases of areca chewing in preschoolers and its oral manifestations. This case report describes two cases of areca nut chewing habit in 5 and 6 years old girls and its oral manifestations along with the literature review. Myth: “Areca Nut chewing can cure iron deficiency anemia.” Educating the society about the myths prevalent in society about its usage is very important. Areca nut chewing should be included as a differential diagnosis of staining of teeth in specific geographical distributions.

Key words: Areca nut, oral habits, substance abuse

INTRODUCTION

Habits involving substance abuse are commonly seen worldwide. Areca nut is the 4th most commonly abused substance in the world.¹ International Agency for Research on Cancer classifies it as carcinogenic to humans.² Alcohol and tobacco are considered the most commonly abused substances worldwide.³

Areca nut is a seed of the areca palm called Areca catechu. It is a very widely grown plant in various parts of Asia such as India, Bangladesh, and Japan.⁴ It finds an important place as a pharmaceutical agent in Ayurveda and ancient Chinese medicinal practices. It is also used as an anti-helmenthic in veterinary medicine.[⁵]

In Indian population, areca nut chewing is a very commonly found habit.⁶ Areca nut (also called as betel nut) is consumed in many forms depending on the geographic area. In Indian language “Hindi,” it is called as “Supari.” The usual accompaniments of areca nut are the leaf of Piper betle (betel leaf), lime, catechu and tobacco. It can be consumed in its raw form after cutting it into pieces with the help of a special cutter. In India, it is most commonly consumed along with paan (betel quid) and tobacco. Lime (calcium hydroxide) is often used with areca nut in combination. Lime is obtained in coastal areas by heating the covering of shellfish (sea shells) or harvested from corals. In central areas of the country, it is quarried from limestone. In the Asian markets lime is sold as a paste mixed with water that is white or pink. Areca nut with or without tobacco can also be chewed as “gutkha” (also known as “paan malsala” or “mawa”), a form that has become very popular. It is commercially available as small pieces of areca nut treated with spices and condiments, with or without tobacco, and packed in small polythene sachets.

Epidemiology

Many studies have been published reporting the prevalence of areca nut chewing in different parts of the world. However, very few reports have been published, which have studied the prevalence of this in children and adolescents. Summary of few such recent studies are tabulated in Table 1.[⁷-¹⁰]

This habit was found to be more prevalent in boys than girls (Studies done in different age groups in different parts of the world).[⁸-¹⁰] But, Farrand et al., 2001[⁷] reported isolated prevalence more in Bangladeshi girls.

Many reports suggest that areca chewing habit starts at a young age.[⁸,⁹,¹¹] The youngest ages of this habit initiation reported, by various authors, are provided in Table 2.[⁸-¹³]

On the evaluation of the source of introduction of habit, different sources were found in boys and girls. For boys, friends were found to be most common source while, for girls, family members played a major role in introducing the habit.[⁷]

Most of the studies have shown that the majority of school children did not know that areca nut chewing was harmful. 3/4th of the subjects in a study done by Nitin et al., 2010[⁸] and 58% of subjects in a study by Rajan et al., 2007[¹³] (whose sample age was above 15) were unaware of its effects.
Table 1: Prevalence of areca nut chewing habit in children and adolescents

<table>
<thead>
<tr>
<th>Study</th>
<th>Place</th>
<th>Age groups (years)</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Farrand et al., 2001[7]</td>
<td>Bangladesh</td>
<td>11-14</td>
<td>77</td>
</tr>
<tr>
<td>Nitin et al., 2002[6]</td>
<td>South India</td>
<td>14.8</td>
<td>19.4</td>
</tr>
<tr>
<td>Oakley et al., 2005[10]</td>
<td>Micronesia</td>
<td>16.3</td>
<td>63.4</td>
</tr>
</tbody>
</table>

Table 2: Ages of initiation of habits according to various studies

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Place</th>
<th>Age of initiation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ho et al., 2000[12]</td>
<td>Taiwan</td>
<td>Elementary school years</td>
</tr>
<tr>
<td>Shah, 2002[4]</td>
<td>Karachi</td>
<td>48% of first grade students were found to be areca nut chewers</td>
</tr>
<tr>
<td>Oakley et al., 2005[10]</td>
<td>Micronesia</td>
<td>Ten years or younger (mean age of initiation: 12 years)</td>
</tr>
<tr>
<td>Singh et al., 2007[11]</td>
<td>Delhi</td>
<td>4% at the age of 7 years or below (mean age 12.2±1.34 years for initiation of consumption of tobacco)</td>
</tr>
<tr>
<td>Rajan et al., 2007[13]</td>
<td>Tamil Nadu</td>
<td>12 years minimum (mean age 22 years)</td>
</tr>
<tr>
<td>Nitin et al., 2010[6]</td>
<td>South India</td>
<td>13 years</td>
</tr>
</tbody>
</table>

There are many reasons why an individual indulges in areca nut chewing. Time pass, frustration and tension due to family members, digestion, and relief from toothache, feeling elated and relaxed[13] and hunger suppression[7] have also been reported in the literature.

Effects of Areca Nut Chewing

Arecoline is one of the major alkaloids in areca nut and majority of the effects of areca chewing are thought to be related to the actions of this para-sympathomimetic agent.[14]

Literature studies divide the effects seen in two broad categories– effects reported by users and observed clinical effects.

Reported by users

Mood elation, relief from tooth ache, improvement in oral hygiene followed by relief from nausea after chewing[8] are the most common reasons cited. Reasons like craving, relief from boredom, aids in concentration, mood elation, good taste, refreshes breadth, like a custom or to look mature[10] are the reasons given by some.

As clinically found

Systemic

Arecoline has been known since 1912 to induce contraction of the bronchial muscles, carcinogenesis, and foreign body aspiration in children, oral sub mucous fibrosis and asthma aggravation.[9]

“Betel-nut” (areca-nut) psychosis was originally described 35 years ago in Papua New Guineans by Burton-Bradley (1977). He described how traditional healers challenged victims with so-called betel nut to induce insanity as a part of their diagnostic strategy.[4] Wollina et al., 2004[15] found that areca nut increases the risk to oral cancer 9.9 times. Acute ingestion can cause asthma exacerbation, hypertension, and tachycardia.

Early poor-quality research reports that betel nut chewing may lessen anemia in pregnant women. Reasons for this finding are not clear, and betel nut chewing may be unsafe while pregnancy.[16]

Local

Extra-Oral

Areca nut chewing for 5 years results in some peculiar facial features like sunken cheeks, stiff cheeks, pseudo proptosis (loss of periocular fat), pseudo malar prominence (loss of subcutaneous fat and sunken cheek). This facial appearance was termed as “areca nut facies” by Chaturvedi, 2009.[6]

Intra-Oral

Black staining, [8] decrease in dental decay,[17,19] severe tooth wear involving incisal and occlusal tooth surfaces, particularly the enamel covering causing sensitivity. However, the degree of attrition is dependent upon,

- The consistency (hardness) of the areca nut
- The frequency of chewing
- The duration of the habit.

Root fractures in chronic areca-nut chewers due to increased masticatory load, and excessive and repetitive masticatory stress applied on teeth during chewing have also been reported.[20]

Nigam and Srivastava, 1990[18] reported protection against dental caries rendered by areca nut chewing. Different authors have reasoned such similar findings differently. Like,

- Stain that often coats the surface of the teeth may act as a protective varnish
- Inducing salivation and sweating (arecoline)
- Tannin - cariostatic
- Areca tannin (0.1-1 mg/mL) suppressed glucosyltransferase activity and consequently formation of dental plaque.

Loss of periodontal attachment and calculus formation was also found greater in areca-nut chewers.[3] This could be attributed to the fact that arecoline:

- Is toxic to fibroblasts at a concentration of 300–500 g/mL, leading to cell death
- Suppress protein synthesis in human cultured periodontal fibroblasts
- Causes growth inhibition.

Areca-nut extracts reduce halitosis, probably by the reduction of the volatility of methyl mercaptan through arecal phenolic derivatives, and slaked lime plays an important role in this function.[2]

Various authors have also reported occurrence of oral pathological conditions [Tables 3 and 4].[8,10,21-26]
CASE REPORTS

Case 1
A 4-year-old girl reported to the department with the complaint of brownish stains on her upper and lower teeth.

While recording the medical and dental history, her father revealed that she had a habit of chewing areca nut since the age of 3 years, and she also sleeps with the areca nut in her hand. Areca nut is freely available from the areca nut tree grown at the house and her parents admitted to having introduced her to this habit.

On examination, the patient had her primary dentition, which showed generalized yellowish-brown extrinsic staining on the cervical third of facial surfaces as well as on the palatal and lingual surfaces [Figure 1]. Enamel craze lines were also seen on all the teeth suggestive of trauma due to biting on hard areca nuts. Further, on transillumination more enamel fractures were noticed [Figure 2].

After consent from her parents, the preventive phase was commenced. Oral prophylaxis was done, followed by counseling (for both the patient and her parents) regarding the adverse effects of areca nut on the general and oral health and she was encouraged to stop the habit.

Case 2
A 6-year-old girl reported to one of our peripheral clinics, with the chief complaint of shaking lower left front tooth and staining in upper lower front teeth. On examination, 71 was found to be showing pre shedding mobility and with generalized brownish staining present. 82 and 83 were found to be fused. On history taking, chief informer, the father, did not reveal any substance abuse habit by the child. On further interrogation, he admitted to the occasional usage of betel leaf by his daughter. The consent was obtained for the treatment and the father was asked to leave the operatory. Oral prophylaxis and extraction of 71 was done for the patient as she was cooperative for dental examination. On questioning, the patient told us that her father gives her betel leaf with areca nut and some white paste on it once a day to eat. Good taste of the mix was the reason she cited to continue the habit.

After confirming the areca nut chewing habit, enamel was transilluminated using composite light cure unit and many craze line were seen. None was clearly visible with naked eye.

After the procedure was over, father was cross checked, and he agreed to the details given by her. He believed that areca nut helped in increasing iron in the blood and lime strengthened the bone and teeth by giving calcium. Father himself had staining on his teeth due to areca nut chewing habit.

This family’s neighbors had a betel plant which was a ready source for them for the betel leaf.

Table 3: Oral pathological conditions caused due to areca nut chewing habit

<table>
<thead>
<tr>
<th>Condition</th>
<th>Author</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areca induced lichenoid lesions, betel chewer’s mucosa - both at quid retained sites, oral leukoplakia, oral submucous fibrosis, gum diseases</td>
<td>Trivedy et al., 2002[23]</td>
</tr>
<tr>
<td>Oral sub mucous fibrosis, leukoplakia, erythroplakia in young adolescents</td>
<td>Chaturvedi, 2003[21]</td>
</tr>
<tr>
<td>Oral leukoplakia and oral sub mucous fibrosis</td>
<td>Oakley et al., 2005[10]</td>
</tr>
<tr>
<td>Oral sub mucous fibrosis</td>
<td>Nitin et al., 2010[8]</td>
</tr>
</tbody>
</table>

Table 4: Few published case reports of conditions caused by areca nut chewing

<table>
<thead>
<tr>
<th>Author, year</th>
<th>Condition</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anil and Beena, 1993</td>
<td>Oral submucous fibrosis</td>
<td>12-year-old girl</td>
</tr>
<tr>
<td>Yusuf and Yong, 2002</td>
<td>Oral submucous fibrosis</td>
<td>12-year-old boy</td>
</tr>
<tr>
<td>Zubairi et al., 2006</td>
<td>Aspiration of betel nut</td>
<td>In 46 and 62 years</td>
</tr>
<tr>
<td></td>
<td>leading to bronchial collapse</td>
<td>old women</td>
</tr>
</tbody>
</table>
After the procedure, patient was amused seeing her white teeth and was motivated enough for not continuing the habit for a good smile.

DISCUSSION

Seeing both the cases, enamel craze fractures and staining the primary teeth were the most common clinical findings seen. Our second patient though agreed for discontinuing the habit; no such positive attitude was seen in first case.

Both the cases, family members, were the main source for the initiation of the habit. Parents started this owing to wrong conceptions prevalent about the positive effects of areca nut chewing. In both the cases, we found that parents were reluctant to render the exact habit history knowing that it’s a social stigma. We found a Myth: “Areca Nut chewing can cure iron deficiency anemia,” which was related to the main reason why parents encouraged areca nut chewing habit in their children.

CONCLUSION

Steps to be Taken to Stop this Habit

Farrand et al., 2001[7] found that the highest period of risk for first use is between 5 and 12 for areca nut chewing. While, Rajan et al., 2007[13] saw that commercial forms of areca nut usage is increasing among youth. The family, as in this presented case, plays a crucial role in maintaining areca nut use.[16] Cheap, bright packets, easy availability, sweet taste and forceful misleading advertisements make it popular among children and adolescent.[20]

To curb this rising stigma, awareness about the habit through Health education has to be imparted. In 95% of study population, family and friends’ were responsible for the introduction of betel, areca and tobacco.[21] Hence family members should also be made aware and they should motivate young children not to initiate the habit at any age.

We as dentists should enable adolescents to realize the potential health risk. Staining of teeth could be used, especially for youngsters, to motivate them to leave this habit. Government agencies have already come forward banning advertisements on print media and putting warnings of packing of such products in India. Selling of tobacco products is also banned to people below 18 years of age. Strict implication of such rules is now required.

REFERENCES


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