

Articles

'Betelmania'

Betel Quid Chewing by Cambodian Women in the United States and Its Potential Health Effects

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Although an estimated 10% to 25% of the world's population chews betel quid, this practice is virtually unknown in the United States. Health care professionals coming into contact with immigrants and refugees from India, New Guinea, and Southeast Asia will increasingly notice this habit. Possible hazards associated with the chewing of the various ingredients of the quid include oral cancer and an addictive potential as strong as for cigarettes. We surveyed a group of Cambodian refugee women who are addicted to betel nut and its associated components. Participant-directed interviews uncovered some of the cultural meanings surrounding the ritual of preparing and using the betel quid and the role of culture in the beliefs and behaviors related to chemical addiction.

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The areca nut, commonly known as betel nut, grows on an Areca palm tree (*Areca catechu*). Thought to have originated on the Malay Peninsula, it is the oldest known masticatory used by Asians.¹ Many older Cambodian refugee women in the United States chew betel nut quid, a combination of areca nut, betel leaf (from *Piper betle*), lime paste, and leaf tobacco. The women are easily identified because the quid causes the teeth to turn black-brown and stains the tongue and oral mucosa. The habit of betel quid chewing is not unique to Cambodian women, being common throughout Southeast Asia, India, and New Guinea. It is estimated that between 10% and 20% of the world's population chews betel.¹⁻³ Although the practice is uncommon in the United States, the prevalence of betel chewing has increased with recent waves of immigrants from Asia and Oceania and mystifies western health care professionals who know little of its use or associated health risks. We review and examine the current knowledge about the health risks associated with betel use, describe the beliefs and behaviors associated with betel use by ten Cambodian refugee women in San Diego, and offer an illustration of the conflicts that result when refugees and immigrants begin to acculturate.

Subjects and Methods

The Division of Family Medicine in the School of Medicine at the University of California, San Diego, supports a variety of cross-cultural clinical experiences for medical students. One of these experiences is with the Cambodian Home Health Care Project. Cambodian

refugees receiving their health care in the Family Practice Clinics are referred to the project for follow-up examinations and health teaching, all of which are done in the home. Fourth-year medical students accompany the project director, a family nurse practitioner, and a Cambodian community aide on these visits. In the past 12 months, more than 150 home visits have been conducted in Cambodian households.

According to the 1990 census, there are approximately 4,185 Cambodians living in the city of San Diego. Although the prevalence of betel use in this population is unknown, a sample of 25 Cambodian residents 40 years and older participating in a health promotion class offered as part of the Cambodian Home Health Care Project revealed that all 12 of the 12 women but none of the 13 men attending the class chewed betel.

In February 1993, we interviewed the first ten Cambodian women encountered during home health visits to family members observed to be chewing betel. Nine of these women have chewed betel quid for many years. The women were between 40 and 81 years of age and had chewed betel for 29 to 77 years. Only one woman was a newcomer to the habit, having chewed for just three years. Characteristics of the women are summarized in Table 1.

A set of probe questions listed in Table 2 were developed for use in participant-directed interviews. The interviews were conducted on home visits by the family nurse practitioner coauthor of this article (S.M.P.) and another coauthor (S.S.) who is a female Cambodian translator, a licensed vocational nurse (LVN), and a trained commu-

TABLE 1.—Characteristics of 10 Cambodian Women in San Diego, California, Who Chew Betel Quid

Subject	Age, yr	Age of First Use, yr	Belief in Health Risks	Report of Physiologic Effects	Believe Hard to Stop
1.....	40	11	Unsure	None	No
2.....	56	16	No	None	No
3.....	58	55	No	Yes	Yes
4.....	60	25	No	None	Yes
5.....	68	30	No	Yes	No
6.....	68	21	No	Yes	Yes
7.....	73	13	No	Yes	Yes
8.....	74	15	Yes	Yes	Yes
9.....	78	5	No	None	Yes
10.....	81	4	No	None	Yes

nity health worker. All questions in the interview format were translated by the LVN to the nurse practitioner, who then recorded the answers on paper. Additional questions asked by the nurse practitioner were translated into Cambodian by the LVN, who then translated the answers into English. The LVN reviewed all written responses to certify that they conformed with her understanding of the Cambodian answers to the questions asked. No men were interviewed because Cambodian men do not chew betel, preferring instead to smoke cigarettes.

Using a method described by Willms and colleagues, our analyses of the data collected during these interviews proceeded through three stages⁴: developing case studies; coding consensus, co-occurrence, and comparison; and abstracting cultural idioms. Particular attention was paid to the importance attached to each aspect of betel nut use by the respondents themselves. These data provided the basis for comparing the respondents' perspective with the perspective and preconceptions of the investigators. Caution should be exercised in evaluating these data because the sample was not selected at random and because the objective of the study was to identify content frames of investigation rather than to test specific hypotheses.

Results

The information obtained from these interviews is organized into categories similar to the questions listed in Table 2. These categories were reordered in the following manner to reflect the importance attached to each topic by the respondents themselves: the ritual of preparation, initiation, sex differences, physiologic effect, habit-forming potential, perceived health risks, cosmetic effect, and reaction of others.

Ritual of Preparation

In San Diego, Cambodian women, usually older than 50 years, chew betel quid composed of all four constituents: areca nut, betel leaf, red lime paste, and chopped tobacco leaf. Imported from Thailand and sold in cellophane bags, these ingredients are readily available in Asian markets. They are relatively inexpensive and do not appear to threaten the financial stability of the household.

The Cambodian word for the ritual of preparation and consumption of betel quid is *slamalou*, which means betel leaf. The ingredients for betel quid are stored in a hammered aluminum lazy Susan. The conveyance has several containers in which each component is stored separately. To assemble the quid, the lime paste is spread on the betel leaf, which in turn is wrapped around the areca nut slice. Tobacco may be wrapped as well, but is generally just placed between the gum and the cheek on the opposite side of the mouth from the quid. The quid and the tobacco are chewed for long periods of time, with much associated spitting. One of the women was edentulous and generally just gummed the hard nut; she sometimes pulverized it with a hammer after it was wrapped to enjoy the full flavor. Spittoons are fashioned from large cans lined with plastic bags. When the plastic bag is full, it is discarded and replaced by a new one. The house of the chewer has a characteristic odor easily identified as betel quid.

All but one of the women used the traditional components of sliced areca nut, whole betel leaf, red lime paste, and shredded tobacco (*Nicotiana tabacum*) to prepare the quid. We have also observed women extracting preassembled quid from their pockets to use when away from home. In this case they may not simultaneously use tobacco. Rather, they enfold the nut in the lime-spread leaf and wrap the preparation with a rubber band until they are ready to chew. Sometimes the leaf and the lime paste are placed in the mouth first, followed by one or more slices of nut, and then a pinch of tobacco.

The women were not self-conscious about the preparation and use of quid. When they were ready to prepare a quid, or spit out the juice, they did so regardless of visitors, meals, or conversation.

Initiation

A clear socialization process is apparent in the decision to start chewing betel. Although women who perceived themselves to be "addicted" to the mixture chew betel when they are alone, the habit arises from camaraderie with other women. Three women who started chewing in childhood (ages 4, 5, and 11 years) had the primary responsibility in their extended families of preparing the quid for their grandmothers. They became

TABLE 2.—Interview Questions Asked of Cambodian Women About Betel Quid Chewing

At what age did you start chewing betel nut and what influenced your decision to start?
Do you consider the practice in any way harmful to your health?
How do you feel when you chew betel?
Can you describe the procedure you follow when preparing the quid?
Are you bothered by the effect betel has on the appearance of your teeth?
How do you think others react to your habit of chewing betel?
If someone wanted to stop chewing betel, would it be hard to stop?
Have you ever tried to stop?
Do you know any Cambodian men who chew betel? Why do you think this is a woman's habit?

curious, the materials for the quid were available, and they observed how much their mothers and grandmothers enjoyed this ritual. They said, however, that use was minimal during their youth, and as with the rest of the women, regular use did not begin until the late teens or twenties. The major contributing factor for the regular use of betel is childbirth. Young women at this time fully enter the social world of mature adulthood, as defined by motherhood. The women described their suddenly new relationship with their own mothers and grandmothers, as well as with neighbors of all ages and contemporaries who were also mothers. Only one woman started to chew in her later years. This 58-year-old said that only three years previously, her neighbor influenced her to join in preparing and enjoying a quid.

Sex Differences

The women considered smoking cigarettes to be a male prerogative and chewing betel to be a female habit. They saw this as sex-specific, and only two could recall seeing or hearing of men chewing. One said her grandfather was known to chew on occasion, and another said she thought men living in the Cambodian countryside sometimes chewed to be sociable, but she was somewhat hazy about this memory. One woman told us that smoking was “not normal” for women, but chewing “is normal.” All appreciated the sociability of the ritual and the emotional connection it fosters with other women. Nine had learned the ritual of quid production from their mothers and grandmothers and one from her friend.

Physiologic Effects

Eliciting information about the physical effects of chewing experienced by the women was difficult. When asked this question, they each denied any effects. Further discussion indicated that our first inquiry was not well understood. Only a 74-year-old woman who had been chewing since age 15 admitted to the stimulating effect noted in physiologic studies. Two women mentioned the “sour taste” of the quid, but another noted that for her it had a bitter taste. The 81-year-old woman answered our question somewhat defiantly by saying “so good—yum, yum, yum.” Three women made a connection between chewing after meals and the better digestion of food. One woman with exceedingly decayed teeth and swollen gums felt that chewing had an anesthetizing effect on her painful gums. All of the women had poor teeth, but Cambodian immigrants as a whole suffer substantial tooth decay and gum disease, so this cannot be blamed on the betel quid.

Apart from the constant chewing and spitting, betel nut use does not appear to produce any noticeable changes in behavior. Cambodians who do not chew betel quid see nothing unusual about the behavior of their betel-chewing relatives, friends, and neighbors.

Habit-forming Potential

Only the 58-year-old woman who had been chewing for just three years felt she did not have a dependence on betel quid. She could go several days at a time without betel. Although she occasionally chewed betel when alone,

chewing seemed to be a social practice for her and generally confined to friendship. Everyone else admitted that the practice was highly addictive, and none of them showed any inclination to quit. They all thought that trying to quit would be difficult. Two of the women joked that they “would rather give up rice” than betel. One 68-year-old woman said she was so dependent that she chewed all day and frequently got up at night to prepare and chew a quid. The only time she had abstained in the 42 years since she acquired the habit was during an eight-day hospital stay. Although the hospital might have objected to the practice, she was entirely too ill to consider it (not unlike smokers when they are too ill to smoke). A 74-year-old woman who had been chewing since she was 15 years old said that the worst thing about being admitted to a hospital is the restriction on chewing. This woman was in ill health and was frequently admitted to a hospital for kidney disease and uncontrolled diabetes mellitus.

Betel chewing appears to be the only habit of these women. None of the Cambodian women seen through the Cambodian Home Health Care Project have reported or been observed using alcohol, opiates, or other drugs.

Perceived Health Risk

None of the women thought that chewing betel was a health risk, although most acknowledged that smoking tobacco causes lung cancer. They did not see an association between tobacco that is chewed and tobacco that is smoked. One woman related that whole tobacco leaf is safe but that shredded tobacco commercially rolled is unhealthy because it is not fresh. She also said that “back home in Cambodia,” people grow all the ingredients for the quid in their own yards. Another woman who had recently returned from Thailand mentioned that she had brought fresh products back to California with her and found them far superior to the grocery store product. No one knew women who had oral lesions or sores on their lips, and they were unaware that in some parts of the world oral cancer is attributed to the areca nut and its associated components. The 40-year-old woman said she began having heart palpitations and subsequently decreased her betel use, but she did not blame betel for the rapid heart beat. Another mentioned that she never swallowed the juice produced by chewing the quid and carefully rinsed her mouth after chewing; she seemed to perceive this as a preventive health measure. She was the only one who said that she did not swallow—everyone else both swallowed and spit. All of the women were examined for oral lesions, and none were found.

Cosmetic Effect

All of the women with teeth had badly stained teeth. None of them perceived this as a problem to either their appearance or their dental enamel. Three thought that chewing the quid actually strengthened their teeth. None of the women we interviewed had good teeth. One woman told us that she thought the tobacco actually cleaned teeth and that she was in the habit of rubbing a

pinch of tobacco against her teeth while preparing the quid to protect her teeth against discoloration. She did not explain why her teeth were so badly stained despite this practice. A second woman described the effects of the tobacco component to be "like a toothbrush." Another seemed to think that good dental hygiene (scrupulous brushing) could keep the teeth from discoloring, but she was not concerned enough to do this.

Reactions of Others

All the women were aware that Americans disapprove of the habit, but it did not concern them. Two of the women were a little belligerent when expressing their unconcern with outsiders' disapprobation. Even the disapproval of health care professionals was dismissed. Through the years only once did one of us know a woman who went to a dentist for cleaning to rid herself of the stain. Whether or not she abstained from chewing in the future is unknown. The only time the women seemed slightly embarrassed about chewing was when we examined their mouths, throats, and teeth during home visits. They were concerned then only if they had a huge wad of partially chewed quid in their mouths. Otherwise the appearance of their teeth and gums caused them no embarrassment. One suggested that although Americans may be offended, Cambodians expect and accept the habit. For several women, stained teeth were a sign of maturity and of aging, a process that is much less threatening to Cambodians than to Americans. The woman who brought fresh quid components back from Thailand told us that she carried a small can aboard the airplane home, thoroughly enjoyed preparing and chewing the quid, and spit into the can in such an unobtrusive manner that no one around her was offended.

Discussion

Health Effects

Arecoline, a cholinomimetic alkaloid, is a major constituent of the betel nut. It is a potent diaphoretic; it stimulates the salivary, lacrimal, gastric, pancreatic, and intestinal glands and the mucosal cells of the respiratory tract; increases muscle tonus and plain muscle movement throughout the body; slows the heart rate; constricts the pupils of the eyes; and mimics the action of acetylcholine in the body.^{3,5} The lime that is part of the betel quid hydrolyzes the arecoline into arecaidine, a central nervous system stimulant that, in combination with the essential oil of the betel pepper (a mixture of phenols and terpene-like constituents), accounts for the euphoric properties of the betel quid when absorbed from the buccal mucosa.⁶ The behavioral effects of the betel quid have also been attributed to arecoline as an inhibitor of the uptake of the neurotransmitter γ -aminobutyric acid.⁷ Arecoline has been found to act as a bronchoconstrictor and has been implicated in high rates of hospital admissions of Asian immigrants for acute asthma.⁸

Areca nut extract has been found to be both cytotoxic and genotoxic and is widely implicated in the development of oral cancers.⁹⁻¹² The saliva of betel nut chewers

has been documented to contain nitrosamines derived from areca nut alkaloids.¹¹⁻¹⁶ Oral squamous cell cancer is the most common malignant tumor in Papua New Guinea, a place where the practice of betel chewing is extensive.⁸ It is also common in other parts of South and Southeast Asia where betel chewing is practiced.⁹ The long-term health effects of continuous betel chewing remain controversial, however. The extrapolation of carcinogenesis data generated from *in vitro* laboratory experiments on animals to the human population often is complicated by altered pharmacokinetics and metabolic conversions and the presence of numerous confounders in humans.¹² Some studies have concluded that chewing betel without tobacco does not carry any significant risk for oral cancer.^{2,17}

The betel vine leaf contains eugonal, an aromatic unsaturated volatile substance that is a central nervous system stimulant, and small traces of an alkaloid reputed to have cocaine-like properties.⁸ Even without the addition of tobacco, the quid is thought to have possible mutagenic and carcinogenic properties¹⁸ and was found to increase the normal intraoral pH of 6 to 7 to a pH of 9 to 12 within a minute after the chewing action commenced.⁸

Lime paste causes accelerated cell turnover by rapidly killing the cells with which it comes into direct contact. This continual turnover increases the likelihood of cell mutations. In areas of the world where the lime is added directly to the nut, instead of wrapped inside the betel leaf, and is then held directly against a specific site in the mouth (usually the right or left cheek), areas of malignant ulceration tend to form.⁸

When used as an ingredient of the betel quid, tobacco leaf carries the same risk for oral cancer as found in populations that chew tobacco alone. Smokeless tobacco use, as it is called in this country, is associated with an increased risk of oral cancer, periodontal disease, and cardiovascular disease.¹⁹⁻²²

The addictive properties of the betel quid are reflected in withdrawal symptoms even among mildly habituated users.²³ In rare instances, heavy use of betel nut has resulted in an acute reversible toxic psychosis characterized by hallucinations and delusions.²⁴

Betel Chewing Beliefs and Behavior

Asians and Pacific Islanders chew betel to enhance social interaction, suppress boredom, relieve tiredness, and increase work productivity.^{3,25-27} In most Asian and Pacific Islander societies, betel chewing is practiced with little or no formal ritual in both public and private settings by men and women of all ages. It is frequently compared with cigarette smoking,³ coffee or tea drinking,²⁵ or alcohol use²⁷ in the United States.

Our observations over many years of community work with Cambodian refugees indicate that the practice of betel quid chewing is widespread among women older than 50 and not unusual among women as young as 40. The prevalence of chewing is limited to women and is part of a socialization process learned at a young age. The symbolism extends beyond the obvious ritual of betel

quid preparation and includes female bonding, especially as it relates to motherhood. Chewing betel is understood to be a rite of passage from girlhood to womanhood. Even those women who experimented with the quid while very young (ages 4, 5, and 11) did not habituate until their late teens or twenties. The defining landmark for them was the birth of their first child. Whatever psychological dependence these women may have on betel quid cannot be attributed to the trauma experienced before or during their migration from Cambodia because for most of these women initiation occurred before these events.

Betel Chewing and Acculturation

Betel nut use reveals a number of aspects of the role of culture in the beliefs and behavior related to chemical addiction (alcohol, tobacco, and drugs).²⁸⁻³¹ The awareness of cultural meanings may cast new insight into clinical problems associated with addictions. This study also offers an illustration of the conflicts that result when refugees and other immigrants begin to acculturate and their traditional beliefs and behaviors are challenged by new beliefs and practices. None of the women in this study indicated any desire to cease the betel quid habit, and there is no widespread concern about the ill health effects of chewing the quid. Apparently oral cancer was not prevalent in Cambodia, and no adverse association has been made with any of the quid's ingredients. Nevertheless, we have been approached by three older Cambodian women who inquired about help to quit. These women were probably influenced by our concern about tobacco and smoking, expressed in our home visits and health promotion classes.

Although a habit like this is the norm in Cambodian society when women reach a certain age, it is not universally admired here in the United States. Young Cambodians consider it distasteful, and young women are not adopting the practice because they are taking on the norms of North American society and of their North American peers. During one of our interviews, a teenager and her boyfriend stopped to listen to our conversation. The young woman told us by word and by facial expressions that she was disgusted by the habit. She knew of no contemporaries who chew betel.

Although this is a habit confined to older women and is not apparently becoming a practice among young Cambodians in this country, the situation could conceivably change as teens enter their childbearing years. Regardless of its prevalence, health care professionals will for years to come see patients addicted to betel. As Cambodian women age, many more will come into contact with the health care system. Physicians will need information about the risk for oral cancers that long-term use can potentiate and should make a special effort to screen for oral lesions.

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