J Oral Pathol Med (2006) 35: 193–6

www.blackwellmunksgaard.com/jopm

REVIEW ARTICLE

Oral cancer and pre-cancer in Myanmar: a short review

P. A. Reichart[1], T. H. Way[2]

[1]*Department of Oral Surgery and Dental Radiology, Center for Dental Medicine, University Medicine Berlin, Berlin, Germany;* [2]*Thunanda Clinic, 158, N/Okkalape, Yangon, Myanmar*

Cancer in Myanmar is one of the 10 leading causes of morbidity and mortality. In 1974, the Yangon Cancer Registry was established. From 1974 to 2001 a total of 85 298 cancer cases were registered. From 1963 to 1972 the average annual incidence rate of oral cancer was calculated to be 363 per 100 000 population. The tongue was mostly affected (31.2%). In one study, the prevalence of oral leukoplakia was 1.7%, erythroplakia 0.1%, and submucous fibrosis 0.1%. No epidemiologic studies of the prevalence of betel quid chewing (BQC) in Myanmar have been performed. One study showed that among 773 individuals over the age of 6 years, 46.4% were habitual smokers. A recent symposium on oral health stressed the necessity to introduce concepts of prevention, focusing on BQC habits and smoking as high-risk factors for oral cancer and pre-cancer in Myanmar.
J Oral Pathol Med (2006) **35**: 193–6

Keywords: betel quid chewing; cancer; Myanmar; oral; pre-cancer; tobacco

Introduction

Oral cancer and pre-cancer is common in South and Southeast Asia. Their association with betel quid chewing (BQC) has clearly been demonstrated (1–5). It has been estimated that about 600 million people indulge in BQC, predominantly in regions where the *Areca catechu* palm ('betel' palm) is grown. Hospital data of the 20th century showed that oral cancer ranked among the top 10 cancers of the body including India and other southeast Asian countries. In Thailand, 3.5% of all cancers were oral cancers ranking fifth in frequency in both genders during the period of 1988–1991 (6).

During the last decades; however, BQC has become less popular in some countries, while in others its prevalence is unchanged or even increasing. Several field studies in Thailand and Cambodia and interviews with Thai and Khmer medical and dental students have shown that the BQC habit has been given up almost completely in these countries (7–9). Only elderly women and some hill tribes still seem to indulge in the BQC habit. As a consequence a decline of oral and pharyngeal cancer in some provinces of Thailand (Chiangmai) has been observed between 1988 and 1999 (10).

In contrast, the habit of BQC is highly prevalent in countries-like India, Pakistan, Bangladesh and, surprisingly, Taiwan where in recent years it has become a major health concern (11).

Myanmar (former Burma) is another country where BQC is still highly prevalent, although information about prevalence or incidence of oral cancer and pre-cancer and their association with BQC and other tobacco habits is very limited.

A PubMed search (February 2005) using the search words oral cancer and Myanmar resulted in only two hits, indicating the sparse data available in the international literature. Also, no data on cancer including oral cancer in Myanmar have been published in 'Cancer incidence in five Continents, Vol. VIII' (12). Because of these shortcomings it was the purpose of the present review to summarize available literature on oral cancer and pre-cancer and their respective etiologies in Myanmar. A hand search of medical and dental literature published in Burmese and Myanmar journals was conducted in order to collect relevant data and information on oral cancer and pre-cancer for this particular country.

Background on cancer in Myanmar

The Union of Myanmar is a developing country with an economy mainly based on agriculture. The total population of Myanmar in 2004 was 53 million, with 75% of the population still living in rural areas. Because improvement of public health services and standards of living, the role of infections as public health problem has gradually diminished and non-communicable diseases including cancer began to dominate the epidemiologic scene.

Correspondence: Peter A. Reichart, Charité, Universitätsmedizin Berlin, Campus Virchow Klinikum, Zentrum für Zahnmedizin, Abteilung für Oralchirurgie und Zahnärztliche Röntgenologie, Augustenburger Platz 1, 13353 Berlin, Germany. Tel: 0049 – 30 – 450 56 26 02. Fax: 0049 – 30 – 450 56 29 01. E-mail: peter-a.reichart@charite.de
Accepted for publication September 26, 2005

Cancer in Myanmar is one of the 10 leading grouped causes of morbidity and mortality in hospitals from 1984 to 1988 (13). In studies carried out on hospital morbidity statistics from specialist and divisional hospitals in Myanmar, cancer in all forms constituted 5–7% of hospital admissions (14). To define the prevalence of cancer in Yangon, a cancer registry was established in 1974 (Yangon Cancer Registry, YCR). From 1974 to 2001 a total of 85 298 cancer cases were registered (men: 40 486, women: 44 712; 15). Cancer morbidity in Yangon rose from 87 per 100 000 populations in 1981 to 1172 per 100 000 populations in 1994 (15). Sources of information for these data were received from a number of hospitals in Yangon and suburbs (15). Generally, ICD-09 of the WHO International Classification of diseases for Oncology (16) was used. The most common cancers (1974–2001) of the YCR by system groups were: (i) digestive tract, (ii) respiratory tract, (iii) female reproductive organs, (iv) breast (female, male), (v) oral cavity and pharynx, (vi) hemopoietic and lymphatic systems, (vii) others and unspecified sites, (viii) male reproductive organs, (ix) skin, (x) bone, cartilage, connective tissue. Common groups of cancer according to organ systems differed somewhat from most common specific cancers (15).

Oral cancer in Myanmar

Previously published report in 1974 (14) and case–control studies were carried out to determine the incidence and risk for causal factors in order to define further the problems of cancer of the oral cavity (i.e. oral and pharyngeal cancer in Yangon). The average annual incidence rate (1963–1972) was calculated to be 363 per 100 000 populations. The tongue was the commonest oral site, constituting 31.2% of all oral cancers, followed by gingival and alveolar process (gum) and the floor of the mouth (19.8%), cheek (16.3%), tonsil and faucial pillars (19.8%), and lip (2.8%). However, in another 10-year study (1974–1983) the most common site of oral cancer was the gum and floor of the mouth (41.9%), followed by lip (25.3%), tongue (19.8%), and oropharynx (13.0%; 17). As regards risk factors, chewing of the BQ containing tobacco was significantly associated with the occurrence of oral and oropharyngeal cancer, particularly the cheek, where the risk was more than 10 times higher in chewers compared with non-chewers. The risk increased with the number of quids chewed per day and was higher in chain-chewers, prolonged chewers, and in those who started chewing at an early age. It was four times higher in persons who kept the quid in the mouth overnight compared with those who did not. These findings indicated a dose-relationship between BQC with tobacco and oral cancer; however, no further statistical and risk analyses of the material was performed.

Another study by Sein et al. (18) confirmed oral cancer to range fifth among all cancers for the period between 1985 and 1988. Seventy cases of oral cancer were recorded at the Institute of Dental Medicine, Yangon, all of which had smoking and BQC habits and were late-stage cases.

The significance of oral cancers has been clearly stated during a Forum on Cancer in Myanmar (19). For the last 28 years (1974–2001) oral and oropharyngeal cancers have consistently been the fifth most common cancers for both genders. Therefore, these cancers were considered a major health issue, particularly from the point of view that these are – in a large proportion of cases – preventable.

Oral pre-cancer in Myanmar

There is little information available on prevalence or incidence of oral pre-cancer and other oral mucosal diseases associated with BQC and other tobacco-related smoking and chewing habits. Lay et al. (20) reported on a house-to-house survey of 11 villages in lower Myanmar to study the prevalence of oral pre-cancerous lesions, and chewing and smoking habits. A total of 6000 persons over the age of 15 years were examined. The prevalence of leukoplakia was 1.7%, pre-leukoplakia 0.3%, erythroplakia 0.1%, submucous fibrosis 0.1%, and cancer 0.03%. Oral lichen planus – a pre-cancerous condition – was seen in 0.4%, smoker's palate (formerly leukokeratosis nicotina palati) in 2.3% of individuals. Correlation between some habits and oral lesions was shown. The effects of oral habits on oral soft and hard tissues and general health have recently been reviewed by Myint (21) during a Symposium on 'Oral Habits in Myanmar Detrimental to General and Oral Health'. The role of BQC with and without tobacco and other smoking habits has clearly been pointed out. While a recent study focused on clinico-pathologic features of oral pre-malignant lesions and conditions (22) describing grades of dysplasia in 70 cases, epidemiologic studies on oral pre-cancer in Myanmar are missing.

Betel quid chewing and smoking in Myanmar

Recently, Lon (23) summarized the BQC habit in Myanmar. Principally, it is similar to BQC habits in neighboring countries. The BQ consists of three major ingredients: the betel 'nut' (areca nut), the betel leaf (*Piper betle*), and lime (calcium hydroxide). Tobacco is often added. Areca nut can be chewed alone (sliced, crushed, or whole) or prepared as a quid. The BQ is prepared by wrapping pieces of the areca nut, catechu, optional ingredients, and calcium hydroxide paste in a betel leaf. The quid is sucked and positioned in the buccal pouch for 15–20 min. The onset of the effects occurs within minutes of mastication and lasts for a mean period of 17 min. While Lon (23) did not comment on the prevalence of BQC in Myanmar, he stated that BQC was gaining popularity among the teenaged youth.

Few earlier epidemiologic studies focused on chewing and smoking habits in Myanmar. To study the BQC and smoking habits a random sample of 1006 household members in 175 households in a village (Lay-daunggan)

were questioned in 1971 (24). Of 773 individuals over the age of 6 years, 46.4% were habitually smoking, mostly cheroots. The gender-specific rates for men and women were 56.8% and 36.0%, respectively. In this study population, 16.2% were regular BQ-chewers and another 8.3% were occasional chewers, with no gender differences. No further studies on the prevalence of BQC in Myanmar have been published. Due to the lack of further epidemiologic studies of chewing and smoking habits, it is difficult to estimate the number of people in Myanmar who are indulging in this habit. If, however, the figures published by Pe et al. (24) are taken as a basis for calculation, between 8 and 12 million people in Myanmar have to be considered as habitual BQ-chewers. In addition, the ubiquitous presence of betel stalls, both in Yangon and in rural areas in particular, is an obvious indicator that the BQC habit is still widely practiced in Myanmar in 2005. Further, it is of considerable interest that 'ready-made' products imported from India as 'Pan Masala' are available on the markets of Yangon (P.A. Reichart, personal observation). These areca nut-containing products, although banned in most states of India, are widely distributed over the Indian continent and obviously also seem to be available in Myanmar. The effects of Pan Masala are identical to BQC, particularly resulting in a pre-cancerous condition, namely submucous fibrosis (5).

A survey of smoking habits of school children in Yangon was carried out on a random sample of 4503 school children in five State High Schools (25). About 44.6% had an experience in smoking and 16.6% were found to smoke regularly. Girls smoked 5.6 times less than boys but they started regular smoking earlier than boys (13 years vs. 16 years of age). The number of smokers in a family was highly associated with the number of children who smoked. The influence of friends played an important role in acquiring smoking habits among the boys, while the family custom to light a cheroot for the parents had an influence on acquiring smoking habits among girls. Another survey on smoking habits was conducted in 31 villages in 1973 (26). Of 7865 persons interviewed, about 35% had smoking experience. Cheroot was the most popular item for smoking. The mean age of smokers who started the habit was 14.1 years in males and 14.4% in females. The majority of smokers started their habits about the age of 17 years. The reasons given for habitual smoking were: 'started smoking because I saw others smoking' for males, and 'started smoking because I was asked to light a cheroot' for females.

Correlation between BQC habit, smoking and oral cancer, and pre-cancer in Myanmar

Generally, the correlation between BQC with and without tobacco (5) has clearly been documented for a number of cancers, including cancer of the oral cavity. The role of smoking for oral cancer and pre-cancer is undisputed.

For most countries of south and Southeast Asia adequate epidemiologic data are available (5), both for BQC habits and smoking. In Myanmar, however, controlled studies have not been carried out on the impact of smoking (15). Data of the Proceedings of a Forum on Cancer in Myanmar indicated that tobacco-related cancers were more common in men (27). Gender differences were highly significant for cancers of the lung, larynx, esophagus, bladder, and stomach. For the tongue, however, no statistically significant effect of smoking could be found ($P = 0.396$). A probable effect of BQC was not described for these cancers, in particular cancer of the tongue. Also, no studies on the cause-relationship between cancer of the oral cavity and the habit of BQC have been published to date.

Prevention of oral cancer and pre-cancer in Myanmar

As has been shown in this document oral cancer in Myanmar is the fifth most common cancer when considered groupwise; this pattern has held true for the last 28 years (15). Oral cancer and pre-cancer are, however, preventable in a vast majority of cases. Their etiology has been described in great detail with tobacco (chewed or smoked) and alcohol playing a key role. In south and southeast Asian countries the habit of BQC is of further importance in the etiology of oral cancer and pre-cancer. Only recently an updated Monograph on areca nut and BQC published by the International Agency on Research on Cancer, Lyon, France (5), could show beyond doubt that BQ containing areca nut but without tobacco must be considered a cause for oral cancer. This is in contrast to earlier views when only BQ with tobacco was considered to represent the cancer-inducing agent.

Prevention of exposure to tobacco, BQ, and alcohol, therefore seems mandatory. Antitobacco activities by the World Health Organization worldwide have made some impact in certain countries, many others however, may have got the message, but no adequate action programs have been developed as yet.

In Myanmar two recent Symposia, the Proceedings of which were published in 2001 and 2002 (27, 28), have addressed the need for prevention of cancers at different levels. Ko (28) summarized the spectrum of cancer control in general: (i) primary prevention as health education, (ii) secondary prevention as early detection, (iii) treatment, (iv) rehabilitation and palliative care, and (v) cancer control research. These principles would apply as well to oral cancer and pre-cancer. Generally, it was suggested that programs on prevention and control should be initiated in Myanmar encompassing:

1 Education (dental/oral and medical health education) on the deleterious effects of smoking, BQC, and alcohol drinking habits and their adverse effects on health in general and oral cancer and pre-cancer in particular (primary prevention). The intake of adequate diet should also be stressed. At the same time awareness of oral cancer among dentists, clinicians [medical general practitioners (GPs)], and the general public should be increased.

2 Screening of populations at risk (targeted screening, secondary prevention) including BQ-chewers, smokers, alcohol consumers, and the elderly.
3 Early detection and adequate treatment of oral cancer and pre-cancerous lesions and conditions.

Discussion and conclusions

Data on prevalence or incidence on BQC, oral cancer and pre-cancer in Myanmar are scarce. Data on incidence of oral cancer in Myanmar are not available in the international literature (12) and have been published only locally. Although, previously in 1974 the YCR has been established, it only covers the urban region of this city with data, which have been compiled from hospital records. Data from other regions of the country are unavailable. No information is available on validity, accuracy, reliability, and representativeness of registry data. Generally, the number of studies on prevalence of BQC, smoking and related potentially malignant oral lesion is very small. Therefore, baseline studies on incidence/prevalence of the BQC habit, on smoking and alcohol consumption in Myanmar are urgently needed. Based on health system research and capacity building prevention programs have to be formulated and implemented for sustainable improvement of oral health in Myanmar.

References

1. Reichart PA. Oral cancer and precancer related to betel and miang chewing in Thailand. A review. *J Oral Pathol Med* 1995; **24**: 241–3.
2. Warnakulasuriya S. The role of betel-quid in oral carcinogenesis. *Dent J Malays* 1997; **8**: 30–7.
3. Jeng JH, Chang MC, Hahn LJ. Role of areca nut in betel quid-associated chemical carcinogenesis: current awareness and future perspectives. *Oral Oncol* 2001; **37**: 477–92.
4. Zain RB. Cultural and dietary risk factors of oral cancer and precancer – a brief overview. *Oral Oncol* 2001; **37**: 205–10.
5. World Health Organization. *IARC monograph on the evaluation of carcinogenic risks to humans, Vol. 85. Betel quid and areca-nut chewing and some areca-nut-derived nitrosamines*. Lyon, France: International Agency for Research on Cancer, 2004.
6. Vatanasapt V, Martin N, Sriplung H, et al. *Cancer in Thailand 1988–1991*. Lyon, France: IARC Technical Report No. 16, 1993.
7. Reichart PA, Philipsen HP. *Betel and miang-Vanishing Thai habits*. Bangkok, Thailand: White Lotus Co. Ltd, 1996.
8. Reichart PA, Schmidtberg W, Scheifele C. Khmer dental student's knowledge about the betel quid chewing habit in Cambodia. *Eur J Dent Educ* 1997; **1**: 129–32.
9. Reichart PA, Khongkhunthian P, Scheifele C, Losuwan P. Thai dental student's knowledge of the betel quid chewing habit in Thailand. *Eur J Dent Educ* 1999; **3**: 126–32.
10. Reichart PA, Dietrich T, Khongkhunthian P, Srisuwan S. Decline of oropharyngeal cancer in Chiangmai province, Thailand, between 1988 and 1999. *Oral Oncol* 2003; **39**: 569–73.
11. Chen JW, Shaw JH. A study on betel quid chewing behaviour among Kaohsiung residents aged 15 years and above. *J Oral Pathol Med* 1996; **25**: 140–3.
12. Parkin DM, Whelan SL, Ferlay J, Teppo L, Thomas DB, eds. *Cancer incidence in five continents*, Vol. VIII, Lyon, France: International Association of Cancer Registry, IARC Scientific Publications No. 155, International Agency for Research on Cancer, 2002.
13. Department of Planning and Statistics. *Hospital morbidity and mortally statistics report for 1984 to 1988*. Yangon, Myanmar: Ministry of Health, 1990.
14. Department of Medical Research. *Cancer patterns in Burma DMR Newsletter No. 4*. Rangoon, Myanmar: Ministry of Health, 1974.
15. Aung S. Epidemiology of cancer in Myanmar. Proceedings of Forum on Cancer in Myanmar, Academy of Medical Science, Yangon, Myanmar, 2002; 33–60.
16. World Health Organization. *International classification of diseases for oncology*, 1st edn. Geneva: World Health Organization, 1976.
17. Way TH, Aung SC, Win A, Zin T. Common oral malignancies. *Burma Med J* 1984; **30**: 350–61.
18. Sein K, Maung KK, Aung TH. An epidemiologic study of 70 oral cancer cases at the Institute of Dental Medicine, Yangon, Myanmar (1985–1988). *Odontostomatol Trop* 1992; **15**: 5–8.
19. Myanmar Academy of Medical Science. Proceedings of Forum on Cancer in Myanmar, Myanmar Academy of Medical Science, Yangon, Myanmar, September 2002.
20. Lay KM, Sein K, Myint A, Ko-Ko S, Pindborg JJ. Epidemiological study of 6000 villagers of oral precancerous lesions in Bilugyun: preliminary report. *Community Dent Oral Epidemiol* 1982; **10**: 152–5.
21. Myint B. Effects of oral habits on oral soft and hard tissues and general health. Proceedings of a Symposium on Oral Habits in Myanmar Detrimental to General and Oral Health, Myanmar Medical Association and Myanmar Dental Association, Myanmar Academy of Medical Science, Yangon, Myanmar, 2002; 10–6.
22. Htwe MT, Myint MP, Win SS, Myint B. Clinico-pathological study of premalignant lesions and conditions. *Myanmar Dent J* 2005; **6**: 16–22.
23. Lon SS. Psychological aspects of abnormal behaviour oral habits in Myanmar. Proceedings of a Symposium on Oral Habits in Myanmar Detrimental to General and Oral Health, Myanmar Academy of Medical Science, Myanmar Medical Association and Myanmar Dental Association, Yangon, Myanmar, 2002; 3–5.
24. Pe T, El-Zawahry MAM, Win KM, Kyi O, Kywe KM. Lay-daunggan community health survey: Part II. Pattern of medical history, complaints, diagnosed morbidity, hypertension, and smoking and betel chewing. *Burma Res Congr* 1971; 7 (abstract).
25. Pe T, Sestak Z, Maung L. Smoking habits of schoolchildren in Rangoon. *Union Burma J Life Sci* 1969; **2**: 353–7.
26. Tint K, Nyun WL, Win K. Smoking habits and use of hard drugs among villagers of 31 villages. *Burma Res Congr* 1974; 149 (abstract).
27. Myanmar Academy of Medical Science Proceedings of the Symposium on Oral Habits in Myanmar Detrimental to General and Oral Health, Myanmar Medical Association and Myanmar Dental Association, Yangon, Myanmar, 2001.
28. Ko M. Towards national cancer control programme. Proceedings of Forum on Cancer in Myanmar, Academy of Medical Science, Yangon, Myanmar, 2002; 157–69.