

Frequency of oral precancerous conditions in 407 Malaysians — with correlation to oral habits

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Summary

ORAL CANCER is the second commonest malignant tumour in West Malaysia. Studies on the frequency of oral precancerous conditions in this country are rare. This paper reports the correlation of the frequency of oral precancerous conditions with oral habits as popularly practised by the various races and sexes in 407 medical workers in West Malaysia and illustrates, incidentally, the many forms of oral stimulants and irritants used by a large section of adult town-dwellers. Seven per cent of the Malays, 8 per

of the Chinese and 25 per cent of the Indians had precancerous conditions. In comparison to 8 per cent of the Malay males, 18 per cent of the Indian males had oral precancerous conditions. None of the Malay females had oral precancerous conditions. Whereas 48 per cent of the Indian females had oral precancerous conditions.

Betel-quid chewing appears to be the most important single habit in causing precancerous conditions. In the Malay male, preleukoplakia and leukoplakia of the buccal mucosa and gingivae and smoker's keratosis of the palate were noted most

frequently. They were often associated with multiple habits and single smoking habit. In the Indian male, preleukoplakia and leukoplakia occurred most frequently on the buccal mucosa and less frequently on the labial commissure, tongue and floor of mouth. Multiple habits were most commonly associated with these conditions. In the Indian female, leukoplakia and preleukoplakia occurred most frequently on the buccal mucosa and less commonly on the labial commissure.

Single betel-quid chewing habit was most frequently associated with the lesions. It is indeed interesting to note the town-dwelling Malay male has virtually discarded the habit of chewing betel-quid in favour of smoking. The betel-quid chewing habit seems to have also been discarded by an increasingly large number of the younger group of Malay females and Indian males. Like his Malay counterpart, the town-dwelling young Indian male prefers to indulge in cigarette smoking rather than in betel-quid chewing. The changing trend in oral habits would certainly result in a change in the race and sex incidence and anatomical sites of involvement of oral precancerous conditions and oral carcinoma over the years.

Introduction

Southeast Asia seems to have the highest frequency of oral cancer in the world. Oral cancer is the second commonest malignant tumour in West Malaysia. Among Indian and Malay males, it occupies first place in the data collected so far (Ungku Omar-Ahmad and Ramanathan, 1968). West Malaysia has a population of nearly nine million people consisting of about 50 per cent Malays, 37 per cent Chinese and 11 per cent Indians (Research Paper No. 1).

Between 1967-1971, the Division of Oral Pathology and Oral Medicine, Institute for Medical Research, Kuala Lumpur reported in all 889 histologically confirmed oral squamous cell carcinoma cases. Of these, 64% occurred in the Indians, 20% in the Malays and 16% in the Chinese. The buccal mucosa (43%), tongue (15%), gingivae (14%), palate (13%), lips (7%) and floor of the mouth (4%) were involved in descending order of frequency.

The relation between oral cancer and betel-quid chewing and smoking is well known (Orr, 1933; Khanolkar and Suryabai, 1945; Sanghvi et al, 1955; Marsden, 1960; and Hirayama, 1966). Muir and Kirk (1960) have made a comprehensive account of the sociological significance and composition of the betel-quid. In short, the betel-quid consists of a young betel leaf, sliced betel nut and slaked lime. The Indians, in addition, generally include

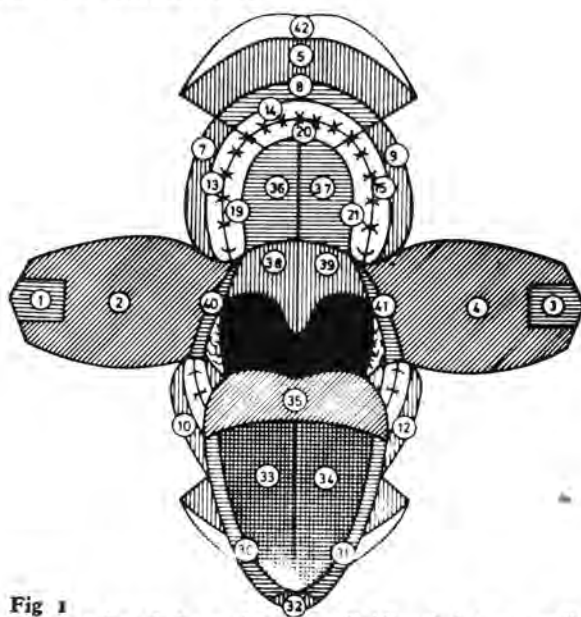


Fig 1
Topography of the oral mucosa dividing it into 41 well-defined regions (after Roed-Petersen and Renstrup, 1969)

tobacco in the quid. The Malays who indulge in betel-quid chewing usually include gambir in their quids. The Chinese as a rule do not indulge in the habit of chewing betel-quids.

Studies on the frequency of oral precancerous conditions in this country are rare. This paper reports the correlation of the frequency of oral precancerous conditions with oral habits as popularly practised by the various races and sexes in this study group and illustrates, incidentally, the many forms of oral stimulants and irritants used by a large proportion of town dwellers.

Material and Methods

The sample consisted of 407 medical attendants and health workers from the following towns: Klang (110), Seremban (76), Raub (61), Kuala Lumpur (59), Tampin (55) and Kajang (46). The group comprised of 248 Malays, 146 Indians and 13 Chinese. None of the workers earned more than \$250 a month. The patients were first interviewed for personal data, including details of oral habits, and then submitted to detail oral examination in a well-equipped dental surgery. For purposes of standardisation of examination, the co-authors were standardised to the senior author (K.R.). Colour slides and preliminary clinical trials were conducted. For the anatomical charting of oral precancerous conditions, the topographical classification of Roed-Petersen and Renstrup (1969) dividing the oral mucosa into 41 well-defined regions was used (Fig. 1).

FREQUENCY OF ORAL PRECANCEROUS CONDITIONS

Table — 1

Distribution of 407 persons examined by race, sex and age groups.

AGE GROUP (YEARS)	MALAYS		INDIANS		CHINESE		TOTAL	
	M	F	M	F	M	F	M	F
15 — 19	18	—	—	—	—	—	18	—
20 — 29	87	17	38	2	1	—	126	19
30 — 39	68	6	35	10	1	5	104	21
40 — 49	35	5	27	15	4	—	66	20
50 — 59	11	1	15	4	—	2	26	7
TOTAL:	219	29	115	31	6	7	340	67

Definitions of Oral Precancerous Conditions

Leukoplakia is defined as a raised white patch of the oral mucosa measuring 5 mm or more in diameter, which cannot be scraped off and which cannot be attributed to any other diagnosable disease. This definition does not indicate any histological connotation. (This definition was adopted by a WHO meeting of Investigators on Oral Precancerous Conditions in Copenhagen, August 1967 and is now being tested by a group of collaborating centres working with the WHO International Reference Centre For Oral Precancerous Conditions in Copenhagen).

Several attempts have been made to classify leukoplakias into various grades. In this study, leukoplakias are subdivided into (1) homogeneous and (2) speckled types. A homogeneous leukoplakia is a lesion which is characterised by a uniform appearance. In contrast a speckled leukoplakia is characterised by a simultaneous occurrence of red and white patches. The red patches represent areas of atrophy of the oral epithelium, whereas the white patches, often of a nodular appearance, are caused by an epithelial hyperplasia. The speckled leukoplakia may be associated with a candida infection. Epithelial atypia is found in the majority of cases of speckled leukoplakias (Pindborg et al, 1963; Pindborg, 1971).

Preleukoplakia is defined as a low-grade or very mild reaction of the oral mucosa, appearing as a grey or greyish-white, but never completely white, area with a slightly lobular pattern and with indistinct borders blending into the adjacent normal mucosa (Pindborg et al, 1968).

Smoker's Keratosis (leukokeratosis nico-

tina palati, nicotinic stomatitis) is defined as a thickened, whitish lesion involving the entire palatal mucosa with occasional small nodular excrescences each having a central red dot. In people who indulge in reverse smoking, the palatal changes of smoker's keratosis exhibit greater variations. The entire palate is not always affected and the small red dots on each excrescence are not present in all cases (Pindborg et al, 1971).

Oral submucous fibrosis is defined as a chronic disease affecting any part of the oral mucosa. Occasionally preceded by, and/or associated with vesicle formation, fibrous bands are always present, usually in the buccal mucosa, the soft palate, and the labial

mucosa, often associated with pigment changes. In later stages, the oral mucosa becomes stiff, causing difficulty in opening the mouth. Very often the tongue papillae disappear, and the surface of the tongue becomes smooth (Mehta et al, 1971).

In the present study, submucous fibrosis was diagnosed only when the patients exhibited the presence of palpable fibrous bands.

Erythroplakia was diagnosed when the oral mucosa was the seat of a well-defined, red, often fiery red patch, which could not be attributed to other causes (Mehta et al, 1971).

Findings

Age

The age of persons examined ranged from 19 to 54 years. Most of the Malay and Indian males were between 20 to 49 years (Table 1). The majority of Malay females were between 20 to 29

Table — 2
Distribution of 55 Persons with Oral Precancerous Conditions

RACE	SEX	AGE-GROUP (YEARS)						TOTAL	GRAND TOTAL	% of total No. patients
		15 — 19	20 — 29	30 — 39	40 — 49	50 — 59				
MALAY	M	SK — 1	L — 4 PL — 3 SK — 2	PL — 4 SK — 2	PL — 2	—	L — 4 PL — 9 SK — 5	18	8	
	F	—	—	—	—	—	—	—	0	
INDIAN	M	—	L — 2 PL — 3	L — 1 PL — 1 SK — 1	L — 2 PL — 2	E — 2 L — 4 PL — 3	E — 2 L — 9 PL — 9 SK — 1	21	18	
	F	—	PL — 1	L — 1 SMF — 1	E — 1 L — 6 PL — 3 SMF — 1	L — 1	E — 1 L — 8 PL — 4 SMF — 2	15	48	
		—	—	—	—	—	—	—	—	
CHINESE	M	—	—	—	—	—	—	—	0	
	F	—	—	PL — 1	—	—	PL — 1	1	14	
TOTAL		1	15	12	17	10	55	55	14	

E — Erythroplakia; L — Leukoplakia; PL — Preleukoplakia; SK — Smoker's Keratosis; SMF — Submucous Fibrosis

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Table — 3
Distribution of 266 Persons who Indulged in Oral Habits

RACE	SEX	AGE GROUP (YEARS)					TOTAL	GRAND TOTAL		
		15 — 19	20 — 29	30 — 39	40 — 49	50 — 59				
MALAY	M	MH — 6	A — 4 MH — 22 S — 26	MH — 15 S — 30	A — 1 MH — 6 S — 16	MH — 2 S — 3	A — 5 MH — 51 S — 80	136		
		—	A — 1	BQ — 1	BQ — 1	BQ+T — 1	A — 1 BQ — 2 BQ+T — 1 MH — 1		6	
		—	—	MH — 1	MH — 1	—	—			
INDIAN	F	—	BQ — 1	BQ — 3 BQ+T — 5	BQ — 3 BQ+T — 9 MH — 3	MH — 2	BQ — 7 BQ+T — 14 MH — 5	26		
		M	—	A — 2 BQ — 1	A — 2 BQ — 1 BQ+T — 1	A — 4 BQ+T — 3 MH — 18 S — 2	—		A — 8 BQ — 2 BQ+T — 5 MH — 62 S — 17	94
			—	MH — 15 S — 10	MH — 18 S — 3	MH — 11 S — 2	—		—	
CHINESE	M	—	S — 1	—	MH — 1 S — 2	—	MH — 1 S — 3	4		
		F	—	—	—	—	—		—	
			—	—	—	—	—		—	
TOTAL		11	83	80	70	22	266	266		

A — Alcohol; Bq — Betel-quist; BQ+T — Betel-quist + Tobacco; MH — Multiple Habits; S — Smoking.

years and in the case of the Indian females, most of them were between 30 to 49 years.

Oral Precancerous Conditions

Fifty-five persons had oral precancerous conditions (Table 2). In comparison to 8 per cent of the Malay males, 18 per cent of the Indian males had oral precancerous conditions. It is also interesting to note that the number of Malay and Indian females examined were approximately the same. None of the Malay females had oral precancerous conditions, whereas 48 per cent of the Indian females had oral precancerous conditions.

The peak incidence of oral precancerous conditions in the Malay male was in the 20 to 29 year age group. This was also the largest group of Malay males to be examined. The peak incidence of oral precancerous conditions in the Indian male was in the 50 to 59 year age group and in the Indian female in the 40 to 49 year age group.

Smoker's keratosis was reported most commonly in the Malay male, preleukoplakia in the Indian male and Malay male, leukoplakia in the Indian male and female. Erythroplakia and submucous fibrosis were reported in the Indians.

Oral Habits

In all 266 (65%) persons indulged in oral

habits (Table 3). They consisted of 136 Malay males, 6 Malay females, 94 Indian males, 26 Indian females and 4 Chinese males.

The single habit of smoking was most popular among the Malay male. Multiple habits, consisting of smoking and an occasional drink of beer, brandy or whisky, was the next common habit. Betel-quid chewing was not practised by the Malay male or for that matter by the Chinese in this study. Five Malay females indulged in betel-quid chewing. All of them added gambir to their quid, but only one in addition included tobacco in the quid.

In the Indian male, multiple habits were most popular, followed secondly by the single habit of smoking. Multiple habits usually consisted of chewing betel-quid (often with tobacco), drinking toddy¹ and samsu² and smoking cigarettes of locally-made Indian cheroots. In the Indian female, the single habit of chewing betel-quid with tobacco was most popular. Multiple habits in the Indian female often consisted of betel-quid chewing and toddy drinking. All the Chinese females had no oral habits.

Toddy¹ — toddy samples would vary with the degree of fermentation and could fall within the range of 3.8 - 15.1% proof spirit.

Samsu² — samsu samples would also vary depending on the brand, whether medicated or illicit and could reach up to 169.1% proof spirit.

Table — 4
Distribution of 407 Persons according to Race, Sex, Oral Habits and Oral Precancerous Conditions

ORAL HABITS		MALAYS			INDIANS			CHINESE			% of total OPC Persons.
		No. of Persons.	Persons with OPC No.	%	No. of Persons.	Persons with OPC No.	%	No. of Persons.	Persons with OPC No.	%	
Single Smoking Habit	M	79	7	8.9	17	2	11.8	3	—	—	16.4
	F	—	—	—	—	—	—	—	—	—	
Single Chewing Habit	M	—	—	—	7	3	42.9	—	—	—	27.3
	F	3	—	—	21	12	57.1	—	—	—	
Single Drinking Habit	M	5	—	—	8	1	12.5	—	—	—	1.8
	F	1	—	—	—	—	—	—	—	—	
Multiple Smoking/ Chewing/or Drinking Habits.	M	51	10	19.6	62	15	24.2	1	—	—	50.9
	F	2	—	—	5	3	60.0	—	—	—	
No Habits	M	84	1	1.2	21	—	—	2	—	—	3.6
	F	23	—	—	5	—	—	7	1	14.3	
TOTAL		248	18	7.3	146	36	24.7	13	1	7.7	100.0

OPC — Oral Precancerous Conditions.

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Table — 5

Distribution of 79 Oral Precancerous Conditions by Race, Sex, Anatomical Site and Oral Habits

Anatomical site	Race and Sex	Total Number	No Habits	Single Smoking Habits	Single Chewing Habit	Single Drinking Habit	Multiple Habits
Buccal Mucosa	MM	12	1	3	—	—	5
	IM	22	—	2	2	1	10
	IF	14	—	—	7	—	3
	CF	2	1	—	—	—	—
Labial Commissure	IM	4	—	—	1	—	1
	IF	4	—	—	3	—	—
Lip	IM	1	—	—	—	—	1
Gingivae	MM	5	—	3	—	—	2
	IM	1	—	—	—	—	1
Tongue	IM	4	—	—	1	—	3
Palate	MM	5	—	2	—	—	3
	IM	1	—	—	—	—	1
Floor of Mouth	IM	4	—	—	—	—	4
TOTAL:		79	2	10	14	1	34

MM — Malay Male; IM — Indian Male; IF — Indian Female; CF — Chinese Female

Correlation of Precancerous Conditions with Habits

In the Malay male, of the 51 persons who indulged in multiple habits, about 20 per cent had precancerous conditions (Table 4). Of the 79 persons who indulged in the single habit of smoking, 9 per cent had precancerous conditions. Of the 84 persons who had no oral habits, 1 per cent had precancerous conditions.

In the Indian male, of the 62 persons who indulged in multiple habits, 24 per cent had precancerous conditions. Of the 17 persons who indulged in single smoking habit, 12 per cent had precancerous conditions. Of the 7 males indulging in a single chewing habit, 43 per cent had precancerous conditions. Of the 8 males indulging in a single drinking habit, 13 per cent had precancerous conditions.

In the Indian female, of the 21 persons indulging in a single chewing habit, 57 per cent had precancerous conditions. Of the 5 females indulging in multiple habits, 60 per cent had precancerous conditions.

None of the Indian males and females with no oral habits had precancerous conditions. Of the 7 Chinese females with no oral habits, 14 per cent had precancerous conditions. None of the Chinese males had precancerous conditions.

Correlation of Anatomic Site of Precancerous Conditions with Habits

In the Malay male, preleukoplakia and leukoplakia of the buccal mucosa and gingivae and smoker's keratosis of the palate were noted (Tables 2, 5). They were often associated with multiple habits and single smoking habit.

In the Indian male, preleukoplakia and leukoplakia occurred most frequently on the buccal mucosa and less frequently on the labial commissure, tongue and floor of the mouth. Multiple habits were most commonly associated with these conditions. In the Indian female, leukoplakia and preleukoplakia occurred most frequently on the buccal mucosa and less commonly on the labial commissure. Single betel-quid chewing habit was most frequently associated with these lesions. The

two cases of submucous fibrosis were in a 35-year-old Indian female who indulged in the single chewing habit of betel-quid with tobacco. She also had anaemia. The other was a 45-year-old Indian female who also indulged in the single chewing habit of betel-quid but without tobacco. In addition, she had an erythroplakia of the right buccal mucosa.

Discussion

It is not possible to make an exact comparison of the present study with two previous reports on the frequency of oral precancerous conditions in this country. The two earlier studies had been limited to betel-quid chewers and did not include all the precancerous conditions included in this study. Moreover, Chin and Lee (1970) did not include smoking and alcohol habits in their study. Ahluwalia and Ponnampalam's (1968) observations on the oral habits of the Indian male and female are similar to our findings. In the Indian male, multiple habits of betel-quid chewing, drinking and smoking were most popular whereas in the Indian female the single habit of betel-quid chewing was most significant. This would suggest that the oral habits of the Indians were similar irrespective of whether they lived in towns or in the rural areas.

Seven per cent of the Malays, 8 per cent of the Chinese and 25 per cent of the Indians had precancerous conditions. None of the Malay females had precancerous conditions. This may be due to the small number of Malay females included in the study and furthermore a majority of them belong to a much younger age group. Moreover, a large number of them (79%) did not have oral habits.

The total number of Chinese included in this study is rather small for any valid observations to be made. It is, however, interesting to note that none of the Chinese females had oral habits. Moreover, it is worth pointing out that the records of the Division of Oral Pathology and Oral Medicine show the Chinese female has the lowest incidence of oral carcinoma (4%) in West Malaysia.

In the Indians, in contrast to 18 per cent of the males having precancerous conditions, 48 per cent of the females had precancerous conditions. In this racial group, 35 per cent of betel-quid chewers had precancerous conditions and only 6 per cent of non-betel-quid chewers had precancerous conditions. This would suggest that the most important single habit in causing precancerous conditions is betel-quid chewing.

In this study, the number of betel-quid chewers who did not add tobacco was rather too small to

make any significant observation between the two groups. It is worth noting none of the Indians with no oral habits had oral precancerous conditions. Ninety-six per cent of all precancerous conditions occurred in persons with oral habits, whereas about 4 per cent of precancerous conditions (all preleukoplakias) occurred in persons with no oral habits. Probably the preleukoplakias could be caused by irritation from teeth as we observed in one of the two persons in this group. It is also possible in persons with no oral habits for a greater per cent of preleukoplakias and leukoplakias to regress.

In the Malay male, about 2.3 per cent had smoker's keratosis, 4.1 per cent had preleukoplakia and 1.8 per cent had leukoplakia. In the Indian male, 0.9 per cent had smoker's keratosis, 1.7 per cent erythroplakia and 7.8 per cent respectively had preleukoplakia and leukoplakia. In the Indian female, 2.3 per cent had erythroplakia, 6.5 per cent submucous fibrosis, 12.9 per cent had preleukoplakia and 25.8 per cent had leukoplakia.

The high incidence of precancerous conditions in the Indian female could be due to a large number of the sample being from the age group where the peak incidence of precancerous conditions occurs in the Indian female. The peak incidence of precancerous conditions in the Indian female (40-49 years) seems to be at a slightly earlier age than in the Indian male (50-59 years).

Ramanathan et al (in press) in a study of the frequency of precancerous conditions in oral cancer patients have shown like oral cancer, the peak incidence of leukoplakia in the Indian female (40-59 years) occurred at a slightly earlier age than in the Indian male (50-69 years). This was not only because the Indian female, as a rule started the habit of betel-quid chewing at an earlier age but also because the lifetime betel-quid chewing hours (product of the number of quids chewed/day \times duration of chewing of each quid \times number of years of chewing) was generally greater in the Indian female.

As expected, the incidence of precancerous conditions generally increased with age. The percentage of precancerous conditions for the various age groups were: 15-19 years (5.6%); 20-29 years (13.4%); 30-39 years (9.6%); 40-49 years (19.8%) and 50-59 years (33.3%).

It is indeed interesting to note the town-dwelling Malay male has virtually discarded the habit of chewing betel-quid in favour of smoking. This could explain the highest incidence of smoker's keratosis in this group. The betel-quid chewing habit seems to have also been discarded by an

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increasingly large number of the younger group of Malay females and Indian males. Like his Malay counterpart, the town-dwelling young Indian male prefers to indulge in cigarette smoking rather than in betel-quid chewing. The changing trend in oral habits would certainly result in a change in the race and sex incidence and anatomical sites of involvement of oral precancerous conditions and oral carcinoma over the years.

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