Cancer in the Sindhi Population of Greater Bombay

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The Sindhis are a Hindu subgroup identified by their place of origin and their written spoken language. These are the people who were originally inhabitants of the Province of Sind, which formed a part of the large Bombay Presidency in Undivided India before 1947. The Sindhi Hindus migrated en masse to India after partition. An attempt has been made here to examine the differences found in the site-specific cancer risks among the Sindhi community, the other Hindu groups (such as the Marathi and Gujrati populations) and the Parsi community of Greater Bombay. As the Indian Census Board does not provide age distribution details for the Sindhis, analysis of the data was undertaken employing frequency ratios. Age-standardized cancer ratios (ASCAR) were also utilized for certain calculations. The common sites of cancer appear to vary greatly between the total Bombay population and the Sindhi group. In Sindhi men, for example, cancers of the lung, large bowel, prostate, kidneys and leukemias are most commonly seen, whereas laryngeal and oesophageal cancers predominate in the general population of Bombay. In Sindhi women the breast, uterus, ovary, and skin are the preferred sites, whereas cancers of the cervix and leukemias are predominant in the general population of Bombay. It is interesting to note that there is a degree of similarity in the incidence of cancer at certain anatomical sites, such as the prostate, large intestine, and leukemias in males, and breast, cervix, ovary and uterus in females, between the Sindhi and Parsi communities of Greater Bombay.

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WHENEVER a migrant group settles in a new country, their basic life-style (*viz.* diet, occupation, recreational habits, and other activities of daily living) tends to be retained for varying lengths of time. The country of birth can thus be utilized as a valuable marker to identify within a given population those communities whose earlier environmental exposure and other characteristics differ from those of other migrant groups in the area and from the natives. Certain habits and customs may be retained, perhaps in modified forms, even in the second and third generation migrants, so that the origin of the parents and grandparents can help to distinguish the population groups with different environmental backgrounds. Previous studies at this Registry revealed striking and significant differences between the Parsi community and the rest of the Bombay population in the incidence of cancer at various sites.[4,8]

Vast differences have been known to exist in the habits and customs of different sections of the large and complex Hindu community in India. One of the ways of identifying the different groups is on the basis of the written and spoken language, which, together with the place of origin, are valuble objective characteristics identifying the different Hindu sects within India.

The Sindhis are one such group of Hindus identifiable on the basis of language and place of origin from other Hindus in the Indian subcontinent. These people migrated en masse from the province of Sind after the partition of India, which had formed in the previous era a part of the large Bombay Presidency. They still employ the Persian script in contrast to the Deonagri or Sanskrit script. Sind was ceded to Pakistan in 1947 and now forms an important part of that country.

Purpose of the Study

The Sindhis are distinguishable from the vast majority of Indians by their habits, customs, and socioeconomic status and, though mainly residing in greater Bombay, present striking differences from the total

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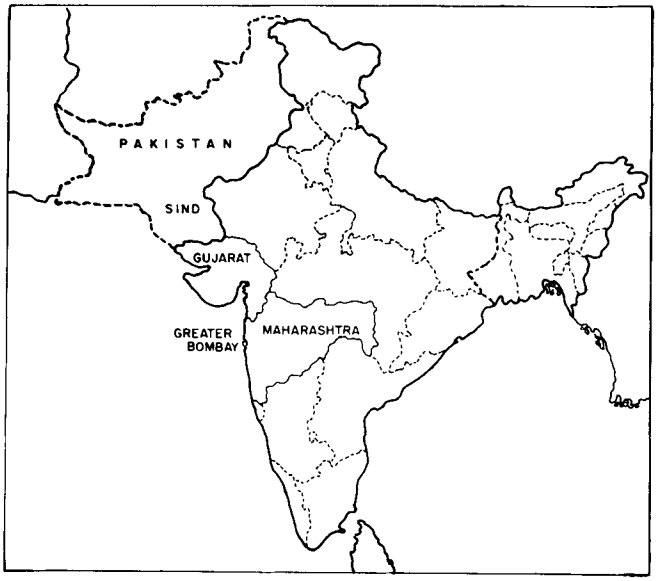

FIG. 1. Map showing the areas of origin of Sindhis, Marathis, and Gujratis.

Bombay population in the relative frequency with which cancer arises at various sites. An appraisal of the situation was thus considered promising in ascertaining whether or not these apparent differences could be ascribed to any recognizable variations in their life-style. We have made an attempt to investigate the site patterns of cancer in this community and to define the magnitude and nature of the differences observed.

Historical Background

With the advent of the Aryans in India about 2000 years ago from the region known historically as "Asia minor," the cradle of the Indo-Germanic civilization, and the migration of the original (Dravidian) native population southwards, the Indo-Gangetic plains became the final homeland of a people of Aryan and mixed Dravido-Aryan stock, professing the Hindu and later the Buddhist faith. This state of affairs continued up to 1500 A.D.; when Sind became the first part of the country to come under the rule of the invading Moghuls from the central Asian hinterland. Due to the subsequent conversion from Hinduism and Buddhism to Islam and by the migration that continued from Moslem countries to the north and northwest of Sind, the ultimate religious denomination of the majority of the local people soon changed, so that by 1843, when the British conquered Sind from the ruling Mirs, barely 10% of the population was known to profess the Hindu faith.

Living in the midst of a Moslem majority, this Hindu minority adopted an unorthodox character, became nonvegetarian and ceased to practice age-old orthodox Hindu customs. Because of initial political patronage shown towards minorities, they were able to acquire wealth through business enterprise and the benefits of a good education. Furthermore, having to survive within a somewhat hostile majority, they instinctively became socially and economically aggressive. As Sind was then predominantly a desert area, many of them left for other parts of the country to earn a better livelihood. Soon this enterprising people blossomed into an interregional trading community. These then were the people who migrated to India in 1947. Once again, within a short time many of them proceeded to other parts of the world, outside India, in pursuit of economic betterment, but continued to keep their roots in India.

Area and Population of Greater Bombay

Greater Bombay is a cosmopolitan city, which by 1971 had acquired a population of 5.97 million, drawn in sizeable numbers from every state in the Indian Union. This urban center is thus representative of a true cross-section of the heterogenous peoples of the country. Hindus, Moslems, Christians, and Parsis constitute 68.8, 14.1, 6.3, and 1.1% of the total population. Of the Hindus, 60% are from the State of Maharashtra, 29% came from Gujrat, and the Sindhis account for only 3.3% of the population (Fig. 1.)[1]

The Marathi-speaking Hindus hail from districts to the south and east of Bombay, whereas the Gujratis come from the western seaboard to the north of the city. Due to the spurt in commerce and industry in Bombay that began in the latter part of the 19th century, both these Hindu groups migrated to the city in search of employment. The Gujratis soon formed the bulk of the commercial community as elsewhere, whereas the Marathi group gained employment as industrial workers, joined the armed forces, and took to the clerical and teaching professions. The Sindhis, however, established themselves in Bombay as professionals, businessmen, and traders.

This densely populated metropolis on the west coast of India covers an area of 437.7 sq km.

Materials and Methods

The basic data utilized for this study were collected by the Bombay Cancer Registry, which restricts its coverage to proved residents of Greater Bombay. Any person who has lived in the city for one or more years prior to the date of diagnosis is considered a resident. During the period under review (1964–72), 31,770 new cancer cases were registered in the Metropolis,

of whom 662 were Sindhis. Three hundred thirty-seven were males and 325 females.

As the Indian census does not provide information on the Sindhi population by age, we have for the present analyzed only the frequency ratios in this community. Comparisons made on the basis of relative frequencies, without simultaneous consideration of the different age groups, can be misleading to some extent. Any comparison between specific groups of cancer cases is thus difficult to make, in the absence of adequate details in the population data. In order to facilitate reasonably adequate assessment, age-standardized cancer ratios (ASCAR) have been calculated. Cancer incidence varies considerably with age. It is a rare event in childhood and adolescence, and is fairly uncommon in young adults. Its frequency then rises almost exponentially with increasing age. The age standardized cancer ratio (ASCAR) was first defined by Tuyns as the relative percentage of cancer seen at any given site in a group of cancer cases where the age distribution is standardized to that of a chosen group. The calculation is made by applying a correction factor to the age-specific percentages, derived from the age distribution of a standard series. By summing up such corrected ratios at any given site, we can obtain the age-corrected ratio for any specific site, relative to the entire series.[12] We have used a standard distribution pattern derived from the world population, as recommended by Doll and his collaborators.[13] In Table 1 world standardized cancer ratios at different ages are compared with the crude ratios calculated for the different population groups in Greater Bombay.

The application of ASCAR is fully justified here as the assumption of equivalent overall incidence rates of Marathi, Gujrati, and Sindhi populations and holds true as the overall crude incidence rates are 55.2, 54.9, and 55.9 per 100,000 of the respective populations. An attempt has been made utilizing both the frequency ratios and ASCAR to identify the cancer load in the Sindhi community. These figures are compared with similar calculations made for the other Hindu groups, the Marathis, and Gujratis.

TABLE 1. World Standardized Cancer Ratios and Crude Cancer Ratios for Different Population Groups in Greater Bombay by Age

Age group	World standard distribution	Population groups			
		Marathi	Gujrati	Sindhi	Parsi
0–14	5.0	3.3	2.7	2.9	1.1
15–24	5.0	3.0	2.5	2.4	1.0
25–34	5.0	8.0	4.5	4.5	2.5
35–44	10.0	19.7	13.0	12.5	7.4
45–54	15.0	28.0	25.9	23.8	13.8
55–64	20.0	22.5	26.6	26.7	23.5
65–74	25.0	11.5	17.7	17.5	29.5
75+	15.0	4.0	7.1	9.7	21.2
TOTAL	100.0	100.0	100.0	100.0	100.0

Common Forms of Cancer

In Sindhi males, the lung appears to be at highest risk followed by the tongue, esophagus, larynx, and large intestine, in descending order. In Sindhi females, the breast ranks first, followed by the cervix, ovary, and esophagus (Table 2).

The common sites of cancer in the overall total population of Bombay during the same period appear to be quite different from the Sindhi canvas. In Bombay males, the larynx is the most common cancer site followed in turn by the tongue, esophagus, lung, and stomach. Lung cancer, which holds first rank in the Sindhis, is in fourth place in the total population. The larynx, on the other hand, is the fourth most common cancer in the Sindhis, but ranks first in the general population. In females, breast and cervix cancers, which occupy the first and second ranks in the Sindhis, reverse their positions in the general population (Table 2).

TABLE 2. Most Prominent Cancer Sites by Sex in Sindhis and Total Population of Greater Bombay (1964–72)

Male								Female							
		Sindhi population			Total population					Sindhi population			Total population		
Rubric.	Site	No. of cases	%	ASCAR	No. of cases	%	ASCAR	Rubric.	Site	No. of cases	%	ASCAR	No. of cases	%	ASCAR
162	Lung	43	12.8	12.3	1650	8.7	8.5	174	Breast	91	28.0	22.9	2130	16.6	14.8
141	Tongue	32	9.5	9.4	1785	9.4	8.4	180	Cervix	34	10.5	7.6	2783	21.7	16.8
150	Esophagus	23	6.8	6.2	1724	9.1	9.0	183	Ovary	18	5.6	6.2	573	4.5	4.1
161	Larynx	23	6.8	5.9	1826	9.6	8.8	150	Esophagus	18	5.6	5.0	974	7.6	8.0
153	Large intestine	18	5.3	5.3	538	2.8	3.1	182	Uterus	13	4.0	4.2	422	3.3	3.7
185	Prostate	16	4.8	5.9	506	2.7	4.2	151	Stomach	12	3.7	3.7	482	3.8	4.8
146	Oropharynx	15	4.5	4.1	859	4.5	3.9	153	Large intestine	10	2.8	3.6	281	2.8	2.8
204–207	Leukemias	15	4.5	5.4	684	3.6	4.5	172	Skin	8	2.5	2.9	151	1.2	2.8
189	Kidney	9	2.7	2.9	190	1.0	1.1	204–207	Leukemias	7	1.9	3.6	385	3.0	3.8

TABLE 3. Crude Incidence Rates per 100,000 Population for Most Common Sites in Sindhis, Marathis, and Gujratis by Sex, Greater Bombay, 1964–72

Males					Females				
Rubric	Site	Sindhi	Marathi	Gujrati	Rubric	Site	Sindhi	Marathi	Gujrati
162	Lung	7.1	4.3	5.6	174	Breast	15.9	7.2	7.8
141	Tongue	5.3	4.1	10.6	180	Cervix	5.9	14.9	8.5
150	Esophagus	3.8	5.0	8.6	183	Ovary	3.1	2.5	1.7
161	Larynx	3.8	5.8	7.5	150	Esophagus	3.1	4.7	4.5
153	Large intestine	3.0	1.5	1.6	182	Uterus	2.3	1.5	1.8
185	Prostate	2.6	1.2	1.7	151	Stomach	2.1	2.0	1.5
146	Oropharynx	2.5	2.4	4.6	153	Large intestine	1.7	0.9	1.8
204–7	Leukemias	2.5	1.1	2.2	172–3	Skin	1.4	0.7	0.3
188	Urinary bladder	1.5	0.5	0.6	204–7	Leukemias	1.2	1.5	1.7

Crude cancer incidence rates at selected sites have been presented in Table 3 for the three Hindu religious subgroups.

Differences by Age

The age-specific percentages by sex among Sindhis Marathis, and Gujratis, are presented in Fig. 7.

In the Sindhis, cancer of the tongue is more prevalent (among people 65 and over) in contrast with the Marathi and Gujrati experience. The age-specific percentages for esophageal cancer in the former group is maximal in the middle-age group (25–34 years) and minimal at older ages (65 and over) in both sexes. The age-specific percentages for cancer of the large intestine are much higher among the Sindhis than in the Marathis and Gujratis. Age-specific percentages for laryngeal cancer reveal lower values in Sindhi males for almost all ages. For lung cancer, at ages of 40 and above the values are much higher in Sindhi males in comparison with Marathis and Gujratis.

In Sindhi females, the age-specific percentages for breast cancer are much higher in the age group 20–54 years. However, at all ages the values of the age-specific percentages for cancer of the cervix are lower in Sindhis.

Due to the different age pyramid of the Sindhis, the values of ASCAR are found to be lower at the prominent sites (the lung, tongue, esophagus, larynx, oropharynx, and kidney) in males and the breast, cervix, and esophagus in females. The age structure of patients with cancer at the different sites does not seem to disturb the site ranking in Sindhi females, whereas in males the prostate and leukemias attain higher ratings.

Observations on Cancer at Selected Anatomical Regions

In Greater Bombay, the buccal cavity and pharynx are the most frequent sites affected by cancer, in contrast with the situation observed in most other

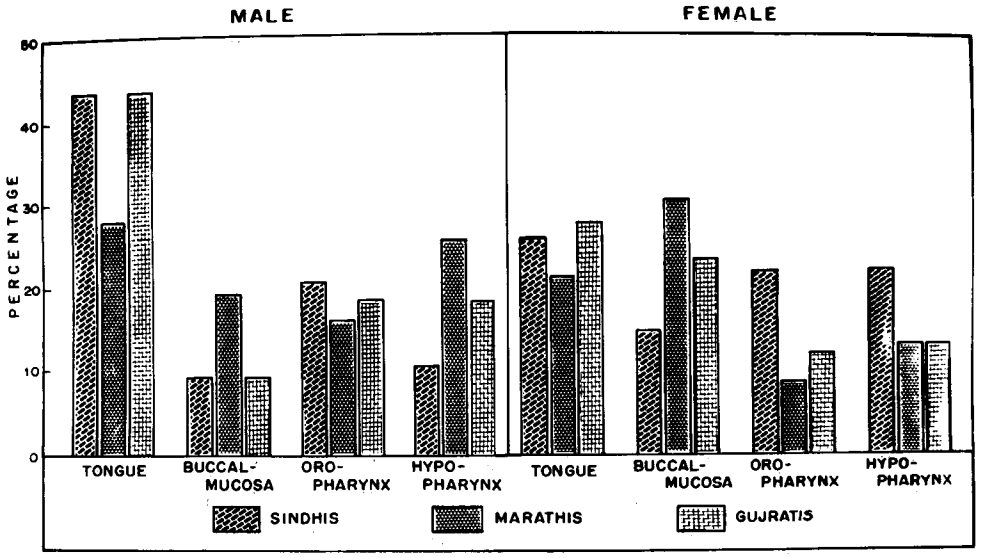

FIG. 2. Distribution of cancer within the oral cavity and pharynx among Sindhis, Marathis, and Gujratis, Greater Bombay, 1964–1972.

TABLE 4. Age-Standardized Cancer Ratios (ASCAR)

Male						Female					
Rubric	Site	Sindhi	Marathi	Gujrati	Parsi	Rubric	Site	Sindhi	Marathi	Gujrati	Parsi
141	Tongue	9.39	6.63	13.68	2.88	141	Tongue	2.29	2.99	2.29	0.98
145	Buccal mucosa	1.97	4.33	2.92	0.82	143	Gum	1.60	1.45	0.98	0.14
146	Oropharynx	4.05	3.89	5.45	0.34	145	Buccal mucosa	1.57	3.49	1.69	0.95
148	Hypopharynx	1.93	5.93	5.90	1.46	150	Esophagus	4.98	8.66	10.22	2.62
150	Esophagus	6.19	9.28	11.43	4.64	151	Stomach	3.68	4.98	3.75	4.49
151	Stomach	2.12	7.15	2.47	8.44	153	Large intestine	3.63	2.05	3.14	5.26
153	Large intestine	5.28	3.02	2.48	5.17	154	Rectum	1.24	1.85	2.78	2.73
154	Rectum	1.26	2.86	2.44	3.68	161	Larynx	1.34	1.98	2.55	0.81
155	Liver (primary)	0.20	0.08	0.77	0.34	162	Lung	2.60	2.58	2.31	2.61
157	Pancreas	1.69	1.14	0.69	4.01	172–3	Skin	2.92	1.37	0.74	1.76
161	Larynx	5.90	9.85	9.46	3.19	174	Breast	22.94	11.34	15.05	32.96
162	Lung	12.28	8.25	7.79	6.84	180	Cervix	7.62	20.27	14.73	3.82
172–3	Skin	1.69	1.19	1.39	4.46	182	Uterus	4.21	3.07	3.94	4.10
185	Prostate	5.93	4.11	3.10	7.35	183	Ovary	6.33	4.33	3.66	6.20
188	Urinary bladder	1.36	1.50	1.48	3.66	184	Vagina, vulva	1.87	1.56	2.17	0.74
197	Secondary (respiratory and digestive system)	6.04	2.91	2.73	3.49	197	Secondary (respiratory and digestive system)	3.40	3.08	3.24	1.72
204–7	Leukemias	5.43	4.07	4.91	7.50	204–7	Leukemias	3.55	2.91	4.93	7.51
	Remaining sites	27.29	22.76	20.90	31.74		Remaining sites	24.22	22.04	21.86	20.62
140–209	All sites	100.00	100.00	100.00	100.00	140–209	All sites	100.00	100.00	100.00	100.00

countries throughout the world.[3] Male preponderance is seen at all sites in this area, in almost all the religious groups. The Sindhis of Greater Bombay, however, present lower frequency (21.7%) when compared with other Hindus, *i.e.*, Marathis (26.9%) and Gujratis (34.3%). In the oral and pharyngeal regions, the tongue is most frequently involved in Sindhi men and women, and the oropharynx and buccal mucosa have the maximum and minimum frequency, respectively, in contrast with the situation seen in the Marathis and Gujratis. The incidence of hypopharyngeal cancer seems to be the lowest and highest in Sindhi men and women, respectively, once again in contrast with the Marathi and Gujrati experience. (Fig. 2 and Table 4).

In Bombay, the esophagus is the viscus most frequently involved in the gastrointestinal tract, but the Sindhis seem to be less affected at this site. The large intestine takes the next rank among Sindhi males, the proportion of Sindhis suffering from cancer at this site being higher than that in the Marathis and Gujratis (in both sexes). In this small community males present a higher proportion of pancreatic cancer, whereas

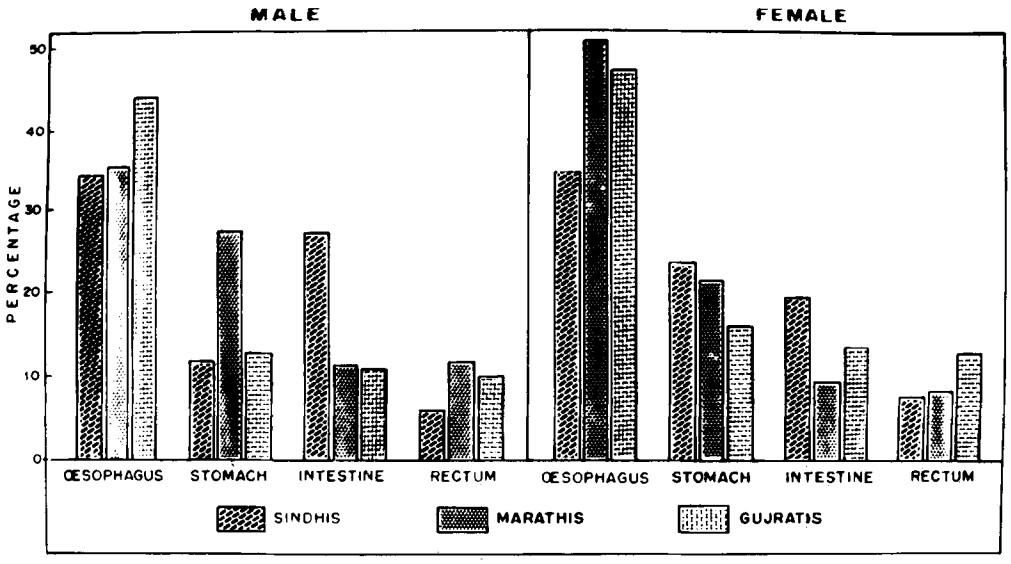

FIG. 3. Distribution of cancer within the gastrointestinal tract among Sindhis, Marathis, and Gujratis, Greater Bombay, 1964–1972.

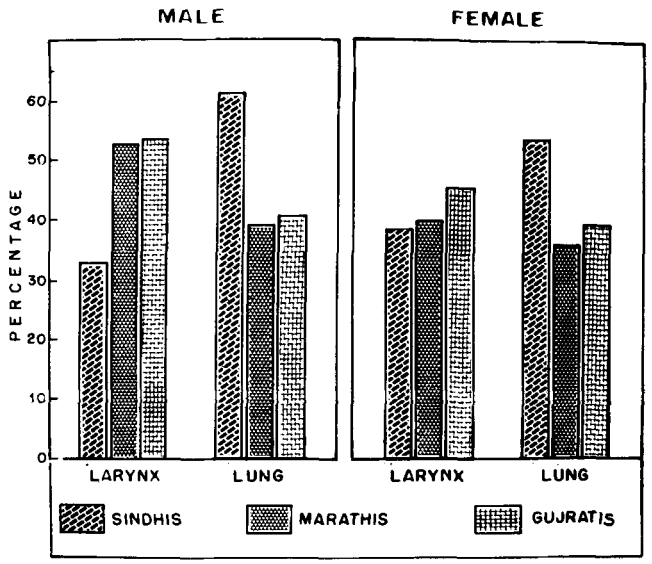

FIG. 4. Distribution of cancer within the respiratory system among Sindhis, Marathis, and Gujratis, Greater Bombay, 1964–1972.

cancer of the rectum is very rare among Sindhi females in comparison with the Marathi and Gujrati women. (Fig. 3).

Major differences are also noticed in the frequency with which cancer occurs at the respiratory organs in both sexes (males 19.4% and females 5.1%). The larynx is the most common affected site among Bombay males, but ranks fourth in Sindhi men. At this site, the lung and larynx cancer rates are the highest and lowest, respectively, in the Sindhis when compared with the other Hindu communities in both sexes. The ratio of lung to larynx cancer is greatly in favor of the former in most countries of the world. The Sindhis follow the standard pattern, although in Greater Bombay the pattern is reversed (Fig. 4).

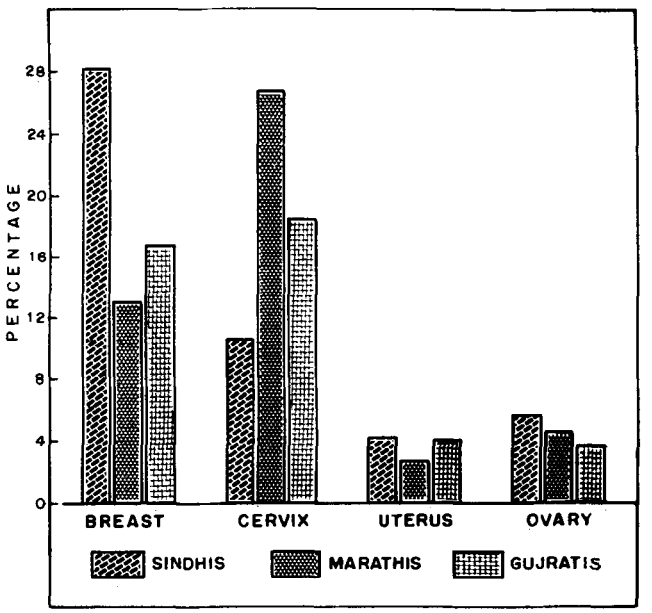

FIG. 5. Percentage distribution of breast, cervix uteri, uterus, and ovary to total female cancer cases among Sindhis, Marathis, and Gujratis, Greater Bombay, 1964–1972.

The breast is the second most common cancer site in Bombay females, but is the most commonly involved site in Sindhi women (just as in western countries). In Sindhi women the rates are 2.2 and 1.9 times higher than those in Marathi and Gujrati females. The cervix, the premier site in greater Bombay women, is only affected half as often in Sindhi women, in whom the proportions are 40 and 60% of the Marathi and Gujrati figures. Cancers of the corpus uteri and ovaries however, are commoner in Sindhi women than in the other Hindu groups (Fig. 5).

In Sindhis the incidence cancer of the male genital organs (grouped together), is higher than that reported for Marathi and Gujrati men. This is mainly due to the high incidence of prostate cancer in the community. Among all Hindus, the incidence of penile cancer is maximal in Marathi men. Cancers involving the urinary organ and skin are less often seen among the Marathi and Gujrati groups, the frequency ratio in Sindhis being higher at these sites. Finally, the percentage of leukemia is greater in Sindhi males than in the Marathis and Gujratis, but in Sindhi females the percentage is lower than in Gujrati women (Fig. 6).

Parsis and Sindhis—A Comparison

A great deal of similarity is noticed in the incidence of cancer at certain anatomical sites such as the prostate, large intestine and leukemias in males, and the breast, cervix, uterus, and ovary in females in the Sindhi and Parsi communities of Bombay.

The high incidence of breast cancer in females and of prostate cancer in males is seen in both the communities, in contrast to the pattern prevalent in the general population in Bombay. A high risk of breast cancer in both these communities could be due to late marriage, infrequent breast-feeding, and low fertility. Furthermore, moderate smoking and minimal tobacco chewing in those with a relatively high socioeconomic status and westernized diet and living habits, may explain the somewhat identical incidence of cancer at various sites in both communities.

In females, there are minimal differences seen in the site pattern of cancer between the Sindhi and Parsi communities of Bombay. In the men, the prostate, large intestine, and leukemias present similar patterns, but contrasting incidence is available for the larynx, oropharynx, tongue, and lung (Table 3) being common sites in the Sindhis. This situation probably arises due

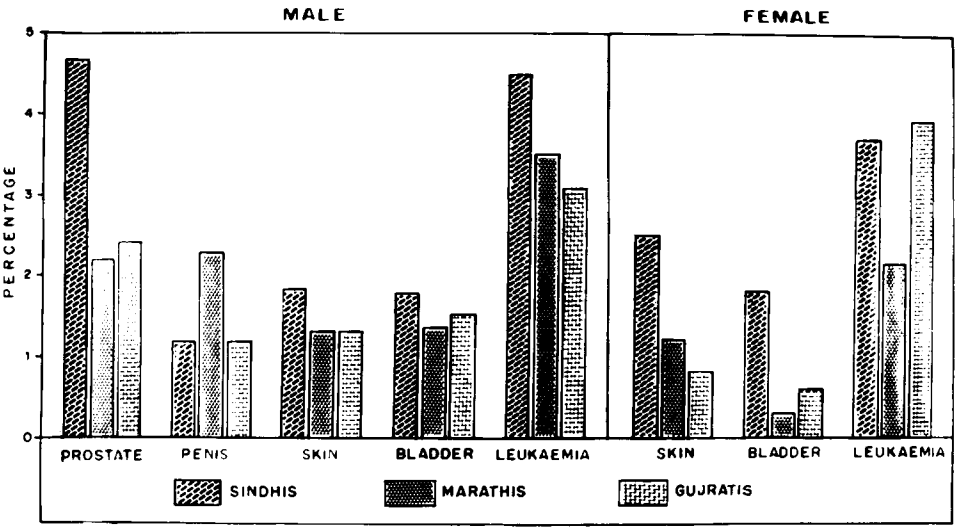

FIG. 6. Percentage distribution of prostate, penis, skin, bladder, and leukemia to total cancer cases among Sindhis, Marathis, and Gujratis, Greater Bombay, 1964–1972.

to the fact that in the Sindhis, smoking, drinking, and chewing habits are more common than in the Parsis.

Discussion

The risk of developing oral cancers is closely associated with tobacco chewing.[6,14] Among Hindus, cancers of the tongue and oropharynx are common in the Gujratis, but cancers of the buccal mucosa and hypopharynx dominate the scene in the Marathi population. The higher incidence of buccal cancer in the less affluent Marathis is probably associated with the habit of chewing the betel quid with tobacco and lime and retaining the cud in the buccal sulcus for a long time.[10] Such chewing causes attrition of the gums and consequent malocclusion of the teeth, finally leading to sharp-edged teeth. Changes are also seen in the periodontal membrane and the underlying bone, which ultimately leads to tilting of the teeth either towards the buccal mucosa or the tongue so that the sharp edges cause excoriation and ulceration of the adjacent mucosa. Such a traumatic ulcer, then, is constantly irritated by the chemical products liberated from the betal chew and, in association with lack of oral hygiene, ultimately gives rise to cancer. The low incidence of oral and pharyngeal cancer in Sindhis is perhaps related to the fact that they are less addicted to chewing and that they maintain better oral hygiene.

In Greater Bombay, pan chewing seems to be strongly indicated as a causative factor in esophageal cancer.[7] The low incidence of cancer at this site in the Sindhis is perhaps due to a lack of such addiction. The stomach is the most common site involved in the digestive tract in many Western populations. This viscus is less affected in the Greater Bombay population; the Sindhis follow this pattern. In Gujratis, the incidence of stomach, colon, and rectal cancers is extremely low. A majority of these people are strict vegetarians who also consume large amounts of milk and dairy products, which probably helps in protecting the mucous membrane of the GI tract.

The risk of developing laryngeal cancer is greater if the pan chewer is additionally addicted to bidi smoking.

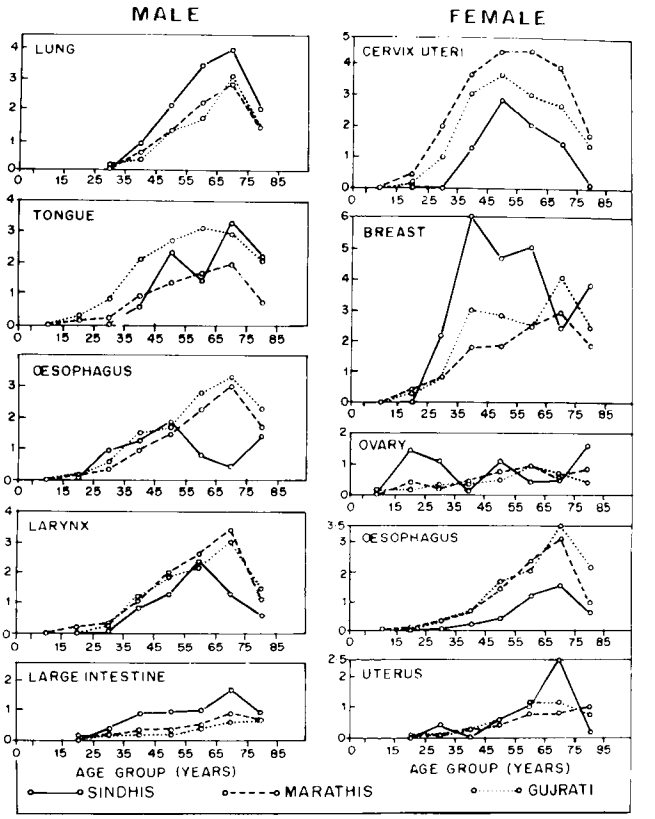

FIG. 7. Age-specific percentages for most common sites in Sindhis, Marathis, and Gujratis by sex, Greater Bombay, 1964–1972.

TABLE 5. Cancers in Relation to Smoking and Chewing Habits

Cancer site	Population group	Chewers only	Chewers and smokers	Smokers only	No habit	Total cancer cases
All related sites*	Marathi	492 (25.8)	649 (34.1)	604 (31.7)	159 (8.4)	1904 (100.0)
	Gujrati	81 (9.1)	242 (27.3)	467 (52.7)	96 (10.9)	886 (100.0)
	Sindhi	3 (3.4)	26 (29.2)	52 (58.4)	8 (9.0)	89 (100.0)
	Parsi	2 (8.0)	—	10 (40.0)	13 (52.0)	25 (100.0)
Other digestive system tumors†	Marathi	140 (30.0)	103 (22.1)	117 (25.1)	106 (22.8)	446 (100.0)
	Gujrati	8 (8.9)	14 (15.5)	35 (38.9)	33 (36.7)	90 (100.0)
	Sindhi	1 (9.1)	—	4 (36.3)	6 (54.6)	11 (100.0)
	Parsi	2 (9.1)	—	2 (9.1)	18 (81.8)	22 (100.0)

* Tongue, buccal mucosa, oropharynx, esophagus, lung and larynx.

† Stomach, colon, rectum, pancreas and liver.
Figures in parentheses indicate the percentage.

It does not seem to matter if the pan quid is chewed with or without tobacco, the risk being maximal in those addicted to both these habits.[6] A direct relationship between smoking and lung cancer has been demonstrated by numerous epidemilogists. Recently, Notani and Sanghvi also have shown the risk from lung cancer is maximal in smokers in the Bombay area.[11]

Table 5 presents cancers in relation to smoking and chewing habits in the Sindhis, Marathis, Gujratis, and Parsis at various sites.

In Table 6, a comparison has been made of demographic characteristics related to cervical and breast cancers among the Marathi, Gujrati, Sindhi, and Parsi populations.

It has been repeatedly observed that the frequency of breast cancer is higher among unmarried women. Our findings also show that women with breast cancer have a low parity and that age at first pregnancy is an important risk factor. The estimated risk for women who deliver for the first time at 30 or later is nearly double that in women who have had their first child before 20.[8] More women seem to remain unmarried in the Sindhi and Parsi communities than in the Marathi and Gujrati groups. The average age at marriage is also higher among the Sindhi and Parsi women, and, over the years, increasingly larger numbers of women marry late. These social factors perhaps have a bearing on the high incidence of cancer of the breast in Parsi and Sindhi women.

Cancer of the cervix is predominantly a disease of married women, especially occurring in those who marry at an early age and bear a large number of children. Whatever influence marital status, active sexual life, and child-bearing may have on the development of cervical cancer, the suspect factors begin to exert their action at a much earlier age. The low risk of developing cancer of the cervix in Sindhi and Parsi women as compared with the Marathi and Gujrati experience may be due to higher average age at marriage, late age at first pregnancy, broad spacing of pregnancies, and fewer number of pregnancies in the Sindhi and Parsi women.

Most countries presenting a high incidence of cervical cancer also seem to have a high cervix to corpus ratio. Marathi and Gujrati women follow this universal pattern, whereas Sindhis and Parsis, by contrast, present a "low proportion and lower ratios." The high cervix-corpus ratio in Marathi and Gujrati women in Bombay, in fact, reflects the low rate of cancer of the corpus uteri rather than a truly high rate of cervical cancer.

The incidence of skin cancer is higher in the Parsis and Sindhis as they have a relatively lighter complexion.[2] The higher incidence of this cancer in these

TABLE 6. Comparison of Demographic Characteristics Related to Cervical and Breast Cancers in the Marathi, Gujrati, Sindhi, and Parsi Populations of Greater Bombay

Characteristic	Cervix				Breast			
	Marathi	Gujrati	Sindhi	Parsi	Marathi	Gujrati	Sindhi	Parsi
Proportion of unmarried women to total women	0.0	0.0	2.1	3.6	2.0	1.0	10.4	10.8
Average age at marriage	13.3	15.1	16.1	19.1	15.1	15.5	19.3	22.7
Average age at first pregnancy	17.7	19.0	20.0	21.1	19.3	19.9	22.9	25.7
Average age at last pregnancy	28.5	29.6	32.8	29.0	27.5	29.4	31.8	33.3
Average number of pregnancies	5.3	5.6	3.3	4.5	3.8	4.4	2.5	4.1
Average spacing of pregnancies	2.6	2.3	4.3	2.8	2.9	2.8	4.6	2.9

communities having less cutaneous pigmentation is probably due to the carcinogenic action of sunlight (ultraviolet) in the relative absence of skin pigmentation in a tropical country such as India. The higher incidence of bladder cancer among Sindhis may also be attributed to smoking.

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