SOME EPIDEMIOLOGICAL CHARACTERISTICS OF NASAL AND PARANASAL CARCINOMA IN SINGAPORE

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SYNOPSIS

The basic epidemiological characteristics are described for 67 cases of nasal and paranasal carcinomas. The overall crude average annual incidence rate was 0.4 per 100,000, with the majority (64%) localised in the maxillary antrum. The ratio of squamous-to adenocarcinoma was about 11 to 1. More than 75% were diagnosed in persons aged 50 and above, and there was a male predominance of 2.5 to 1. There was no bias towards any of the major ethnic groups, while among the Chinese, Cantonese seem to have lower rates compared to the others. One of the patients worked in a saw-milling factory and another in a shoe factory. There was no indication of a significant association between the subjects and any one specific occupation. The findings are discussed.

INTRODUCTION

Malignant neoplasms of the nasal and paranasal cavities (I.C.D. code 160-) are rare all over the world. The average annual incidence rate (standardised according to Segi's world population) for Singapore in the period 1968-74 was 1.2 per 100 000 among males, as opposed to 14.9 per 100 000 for nasopharyngeal cancer and 51.3 for lung cancer. Among females, the age-standardised rates were 0.4 per 100,000 for nasal, 6.2 for nasopharyngeal and 17.1 for lung cancer.

Over the eight-year period 1968-75, the Singapore Cancer Registry received a total of 90 notifications on malignant neoplasms of the nasal cavities and accessory sinuses from among the local residents. Of these, 23 were of various other histopathological diagnoses, leaving 67 carcinomas of different cell types.

The patients with carcinomas comprised the subjects of our epidemiological study, the main objective of which was to determine the occupational histories, since nasal cancer is now well known to be associated with some occupational groups.

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MATERIALS AND METHODS

This was essentially a retrospective study of a descriptive nature. Out of the total of 67 subjects, 45 (64.3%) were already deceased at the time of study — September/October 1977.

As some of the occupational histories were incomplete, attempts were made to home-visit all the subjects. Two trained field-investigators worked daily for about a month to trace the homes. Interviews were conducted either with the patient concerned or, if deceased, with a close relative.

Data already available on the notification forms as well as death certificates were verified as far as possible. The results to be presented would then be based on information pooled from the various sources.

RESULTS

Response

Of the 67 homes to be visited, only 25 (37.3%) were located, and as most of the patients had deceased, the relatives were interviewed (Table 1). Besides collecting additional information, all available data were checked and found to be consistent.

The subjects who could not be located had moved to other unknown addresses, with many of the homes already demolished. Out of the 42 not visited, about half were known to be deceased according to the death register. From the consistency of information verified for those who were interviewed, it can be assumed that the available data on the notification forms for these other subjects are equally reliable.

Histopathological typing and sub-sites of lesions

Table 2 shows the various carcinomas according to the main cell types, as determined by a single pathologist. The majority (70.1%) were of the squamous cell type, while 13.4% were of the so-called "transitional type" and only 6% were adenocarcinomas. The ratio of squamous-to adenocarcinomas was about 11 to 1.

About 64% of the subjects had lesions originating in the maxillary antrum and only 9% were from the ethmoid sinus. The rest were evenly shared between the nasal cavity and the eustachian tube/middle ear.

Age and sex distribution

About 79% of all the cases were aged 50 years and above at the time of diagnosis. The average annual incidence rates increased remarkably from less than 0.1 per 100 000 in the age-group below 40, to about 2 per 100 000 at 50-59 and 3 per 100 000 in the group 60 and above (Table 3). Expect for the below 40 group, male preponderance was seen in all age-groups. The overall sex ratio was 2.5 males to 1 female.

Ethnic group distribution

The ethnic group distribution reflects the ethnic composition of Singapore, with 80% of the cases Chinese, 13% Malay and 7% Indian. The crude average annual rates were roughly similar in all the 3

TABLE 1: Response to home-visitation, by current status of subjects

Response	Current Status			Total
	No. Alive	No. Dead	No. Unknown	
Located & Visited	2	23	—	25 (37.3%)
Not Located	—	22	20	42 (62.7%)
Total	2	45	20	67 (100.0%)

TABLE 2: Distribution of subjects, by sex and types of carcinomas

Histological Typing	Male	Female	Total
Squamous carcinoma	35 (72.9%)	12 (63.2%)	47 (70.1%)
"Transitional" type	7 (14.6%)	2 (10.5%)	9 (13.4%)
Adenocarcinoma	2 (4.2%)	2 (10.5%)	4 (6.0%)
Other and unspecified carcinoma	4 (8.3%)	3 (15.8%)	7 (10.4%)
All cases	48 (100.0%)	19 (100.0%)	67 (99.9%)

( ) figures in parentheses refer to proportions.

TABLE 3: Distribution of subjects, by sex and age-group

Age-group	Male	Female	Total
Below 40	1	2	3 (0.02)
40 —	7	4	11 (0.8)
50 —	19	4	23 (2.1)
60 +	21	9	30 (3.2)
All ages	48 (0.6)	19 (0.2)	67 (0.4)

( ) figures in parentheses refer to crude average annual incidence rates per 100 000, based on 1970 census population.

TABLE 4: Distribution of subjects, by sex and ethnic group

Ethnic Group	Male	Female	Total
Chinese	38	15	53 (0.4)
Malay	5	4	9 (0.4)
Indian	5	0	5 (0.4)
All groups	48 (0.6)	19 (0.2)	67 (0.4)

( ) figures in parentheses refer to crude average annual incidence rates per 100 000, based on 1970 census population.

groups (Table 4).

Among the Chinese, 51% of the cases were Hokkiens, 23% Teochews and 8% Cantonese. While the crude average annual rates for Hokkiens, Teochews and other Chinese were in line with the overall rate, that for the Cantonese was very low (Table 5).

Occupational history

All the subjects had the same occupation throughout the greater part of their lives, and this facilitated analysis somewhat. In spite of the small numbers, there was a good spread of occupations in most of the classes. No one occupation was grossly outstanding in terms of numbers (Table 6).

It is interesting to note that there was 1 wood-cutter and 1 shoe-maker from among the patients.

TABLE 5: Distribution of Chinese subjects, by sex and dialect group

Dialect	Male	Female	Total
Hokkien	18	9	27 (0.5)
Teochew	9	3	12 (0.4)
Cantonese	3	1	4 (0.2)
Unknown/Others	8	2	10 (0.4)
Total	38	15	53 (0.4)

( ) Figures in parentheses refer to crude average annual incidence rates per 100 000, based on 1970 census population.

TABLE 6: Distribution of subjects*, by sex and occupation
(* all subjects are 10 years and above)

	Male	Female
(A) Unknown	23	4
(B) Housewife	—	13
Student	—	1
(C)		
(I) Prof., Tech. workers		
(a) Chemist (Brewery)	1	—
(b) Dentist	1	—
(c) Teacher	1	—
(II) Admin., Manag. workers		
(a) Manager/Supervisor	1	—
(III) Clerical and rel. workers		
(a) Attendant	2	—
(IV) Sales workers		
(a) Proprietor/Businessman	1	—
(b) Hawker/Vendor	3	—
(V) Service workers	—	—
(VI) Agri. workers		
(a) Farmer (vegt./poultry)	5	—
(VII) Production, Transport operators		
(a) Wood-cutter	1	—
(b) Construction worker	3	—
(c) Shoe-maker	—	1
(d) Book-binder	1	—
(e) Seaman	3	—
(f) Driver	2	—
Total	48	19

DISCUSSION

Occupational cancers generate much community concern because society cannot accept any mishap that is largely man-induced, and thus avoidable. Nasal cancers are known to be uncommon all over the world and when more than the usual numbers occur, some aetiological clues often point to a manufacturing process.

Where there have been epidemiological interests in this disease, adenocarcinomas seem to occur in much greater proportions, sometimes in numbers equal to squamous carcinomas (Hadfield, 1970). They tend to occur in younger subjects, who have had exposure to some suspected occupational carcinogen. Prominent among the industrial pollutants incriminated are isopropanol or substances used in their production (Weil et al, 1952), nickel (Doll, 1958), hardwood dust (Acheson et al, 1968; Mosbech, 1971) and organic dust in the boot and shoe industry (Acheson et al, 1970).

This series from the population-based Singapore Cancer Registry comprises squamous-and adenocarcinomas in the ratio of 11 to 1, very much in line with the usual picture of "more than 10 to 1" as quoted by Hadfield (1970). The sub-sites of lesions again reflected the common situation (mainly maxillary antrum) contrary to the reports of Acheson et al (1968) and Hadfield (1970) where the occupationally associated carcinomas arose mainly in "the ethmoids and turbinates".

More than three-quarters of the cases were diagnosed in persons aged 50 years and above, and there was a male predominance of 2.5 to 1. These are all not unusual findings.

The ethnic group distribution did not reveal any significant difference from the ethnic composition of Singapore. Further sub-division of the Chinese by dialects only showed one unusual finding - the relatively low incidence rate among Cantonese, while the Hokkiens, Teochews and other Chinese had more or less similar rates. This may well be due to small numbers. But it must be noted that this is in great contrast to the picture for nasopharyngeal carcinomas, where the Chinese in general, particularly the Cantonese, are known to have significantly higher rates (Ho, 1967; Shanmugaratnam et al, 1970). Hokkiens and Teochews seem to resemble each other in their cancer patterns (Shan-

mugaratnam, 1973), and this present study again reflects this observation.

Going by numbers, no definite conclusions can be made concerning any association with a specific occupation. It is also to be noted that adenocarcinomas, the cell-type most often associated with occupational risk-factors, remains rare in this country.

One of the patients was a wood-cutter for more than 30 years in a saw-mill. A male Cantonese, he was diagnosed to have squamous-cell carcinomas at the age of 69. He was handling mainly soft wood and not the hard ones used in furniture making. The other patient of interest was a female Hokkien, aged 66 years, and also diagnosed as having squamous-cell carcinomas. She worked for more than 20 years in a factory manufacturing shoes of canvas and rubber.

These cases do not suggest any association between the malignancy and the patients' occupations. Considering that the estimated latent period is 30-40 years, many of Singapore's industries have not had such a long history as yet. The lessons learnt from other developed countries may well have resulted in safer materials and less hazardous processes being applied. Also, the small numbers involved in specific industries are insufficient to produce enough cases of neoplastic disease for testing any aetiological hypotheses. Perhaps, with the passage of time and with more cases accumulated, a better profile can be drawn concerning this subject.

ACKNOWLEDGEMENTS

Prof. K. Shanmugaratnam, Director, Singapore Cancer Registry provided the basic data and much valued assistance in seeing the project to its completion. Prof. W. O. Phoon, Head, Dept. of Social Medicine & Public Health provided the relevant personnel, especially Misses Julie Yeo and B. H. Tan, who conducted the home interviews.

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