

TUMOURS OF THE NASOPHARYNX—SINGAPORE 1969-1971 THE PRESENTING PICTURE

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SYNOPSIS

369 patient records of nasopharyngeal tumours treated between 1969 and 1971 were examined. As expected, high incidence rates for Chinese were obtained (10.9 per 100,000 males and 3.74 per 100,000 females). The sex ratio was 3.07:1. Peak age incidence occurred at the 6th decade (males) and 5th decade (females).

Common presenting symptoms were neck swelling (61.4%), epistaxis (47%) and tinnitus (38.9%).

Presentation was usually late (51% with N2, N3 stage) though duration of symptoms was short (67% under 6 months).

Histologically, undifferentiated carcinoma was the commonest (95% of nasopharyngeal biopsies and 69.8% of cervical node biopsies). 81 patients had other associated pathology.

INTRODUCTION

The high incidence of nasopharyngeal cancer in Chinese populations both in China and in emigrant communities has been long recognised. In Singapore, with its predominantly Chinese population this neoplasm is commonly encountered.^{3, 4, 7} Since the treatment is almost solely by radiation therapy, the great majority of patients would be ultimately seen at the sole Radiotherapy Department in Singapore from its inception in 1953.

MATERIAL AND METHOD

This paper analyses the case records of patients with nasopharyngeal tumours treated at the Radiotherapy Department, Outram

Road General Hospital from 1969 to 1971. During this period 369 case records of such patients were coded for analysis comprising 362 cases of nasopharyngeal cancer (all except 1 with histological confirmation from nasopharyngeal or lymph node biopsy), 3 cases of angiofibroma, 2 cases of malignant melanoma and 1 case each of malignant lymphoma and chordoma. A number of these patients would have come from outside Singapore for treatment. This introduces a source of error in computing incidence rates, which however is probably a minor one. More importantly, the number of cases not referred to the department because they either seek treatment outside Singapore or decide on traditional herbal medication or are in too advanced a stage of disease, would render these rates an underestimation of the true incidence rates. The computation of rates was referred to the Census of Population, 1970, Singapore.

Age and Sex Distribution

Table I shows the distribution of cases by age in decades and by sex. The figures refer to all tumours of the post-nasal space with figures in brackets denoting the distribution of the 7 cases of tumours other than carcinoma.

The case incidence of nasopharyngeal carcinoma for males peaked at the 5th and 6th decades and for females at the 5th decade. However the age-specific incidence for males peaked later at the 6th and 7th decades and

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TABLE I
 NASOPHARYNGEAL TUMOURS—SINGAPORE 1969-1971
 DISTRIBUTION BY AGE AND SEX; AGE SPECIFIC INCIDENCE FOR NASOPHARYNX
 CARCINOMA ONLY (NPC)

Age Group	Males	Females	Persons	NPC Age Specific Incidence per 100,000 per annum	
				Male	Female
10—19 years	10(2)x	2	12	0.97	0.26
20—29 years	20(1)x	10	30	3.73	2.00
30—39 years	51(1)*	20	71	13.13	5.45
40—49 years	72(1)°	27	99	24.45	10.65
50—59 years	79(1)†	17	96	36.20	8.75
60—69 years	39(1)M	12	51	30.53	9.77
70—79 years	8	2(1)M	10	22.09	1.97
TOTAL	279	90	369		

Distribution figures refer to all tumours

Figures in brackets denote Non-Carcinomatous tumours except for the one case without biopsy

()x = Angiofibroma

()* = Chordoma

()† = Lymphoma

()M = Malignant Melanoma

()° = Clinically NPC—No biopsy done.

Male : Female Ratio = 3.10 : 1 (All tumours)
 3.07 : 1 (NPC)

TABLE II
 NASOPHARYNGEAL CARCINOMA—SINGAPORE 1969-1971
 DISTRIBUTION BY ETHNIC GROUP

	All Ethnic Groups		Chinese		Malay/ Indonesian		Indo-Pakistan		Mixed	
	M	F	M	F	M	F	M	F	M	F
No. Persons	273†	89	261	88	8	—	4*	—	—	1
Total Persons	362		349		8		4		1	
%	100		96.4		2.21		1.1		0.28	

† Includes 1 case without histological confirmation.

* 1 Gurkha patient referred from the British Military Hospital, Singapore.

for females reached maxima at the 5th and 7th decades with a slight dip at the 6th decade.

The spread of ages was from 14 (in a female) to 77 (a male) both with nasopharyngeal carcinoma. For all ages, the sex ratio for all tumours was 3.10 males: 1 female and for carcinomas 3.07:1. The male preponderance obtained over all age-groups. In comparison Mekie³ reported a 3:1 ratio and Muir's⁴ figures for all categories gave a M:F ratio of 2.69:1, whilst Digby¹ gave a figure of 3.12:1 and Ho's² 1961 series reported a ratio of 2.59:1.

Ethnic Group Distribution (Table II)

The 362 cases of carcinoma comprised 349 Chinese (96.4%), of whom 261 were males and 88 females (M:F=2.96:1), 8 Malays (2.21%) all of whom were males, 4 Indians (1.1%) also all males and 1 female (0.28%) of mixed ethnic group origin. These figures are generally in agreement with those given by Tan⁷ in the 1960-1964 series from the same department. The proportion of Malays in the present study however appears to be lower, 2.21% compared

to 3.3% whilst that for Indians is higher, 1.1% against 0.6%.

Table III compares the crude incidence rates by ethnic group obtained in this analysis with the rates given by Muir *et al.*⁵

The lower incidence rates in the present study for the Chinese are to be expected for as earlier pointed out, this analysis is only of patients treated at the Radiotherapy Department. A rate for rate comparison, expressed in the table as a percentage might perhaps be taken to indicate the degree of willingness of each of the sub-groups to show up for irradiation. On this assumption it would appear that Chinese females were rather less willing to come for irradiation than Chinese males whilst Malay females could be construed to be most reluctant to accept hospital treatment even after agreeing to biopsy (Muir's cases were all histologically proven). The figures for Indian males are higher than would be expected from the previous Singapore reports. Of the 4 cases seen, 1 was a Gurkha referred from the British Military Hospital, Singapore. The incidence rate is based on the other 3, all undoubtedly Indian (2 Sikhs, 1 Tamil) domiciled in Singapore. As the number of cases is small it would be speculative to

attempt an explanation of this relatively high incidence rate for Indians in this study.

Chinese Dialect Groups

Information on the Chinese dialect group was available for 234 cases. An analysis of these cases indicate that the Cantonese were by far the most susceptible to this neoplasm followed in order by the Hainanese, the Teochews, the Hokkiens and others (Table IV).

Symptomatology

The majority of patients had multiple symptoms. These were analysed into a presenting or chief symptoms for each patient and associated symptoms (Table V).

Neck swelling was easily the commonest presenting symptom followed by epistaxis, nasal obstruction, tinnitus, headache, nasal discharge and deafness. Less common were symptoms like diplopia, dysphagia, impaired vision and numbness, all of which were probably manifestations of various cranial nerve palsies.

For the associated symptoms, the order of frequency is a little different with tinnitus leading the list followed by epistaxis, nasal

TABLE III
NASOPHARYNGEAL CARCINOMA—SINGAPORE
COMPARISON OF CRUDE INCIDENCE RATES BY ETHNIC GROUP
PRESENT STUDY (1969-71) AND MUIR *ET AL* (1971)

Crude Incidence Rate per 100,000 per year	Chinese		Malay		Indian	
	M	F	M	F	M	F
(1) Present Study (1969-1971)	10.92	3.74	1.68	—	1.14	—
(2) Muir <i>et al</i> , 1971 (1960-1964)	13.8	6.4	3.2	0.9	0.4	—
(1) as % (2)	79.1	58.44	52.5	—	—	—

TABLE IV
NASOPHARYNGEAL CARCINOMA—SINGAPORE 1969-1971
CHINESE DIALECT GROUPS

Dialect Group	No. Persons NPC	% Total	% Total Chinese Population 1970 Census
Cantonese	83	35.47	17.0
Hainanese	25	10.68	7.31
Teochew	41	17.52	22.34
Hokkien	68	29.06	42.21
Other Groups	17	7.26	11.14
TOTAL	234		

TABLE V
NASOPHARYNGEAL TUMOURS—SINGAPORE 1969-1971
PRESENTING AND ASSOCIATED SYMPTOMS

Symptom	No. with Presenting Symptom	Frequency of Presenting Symptom	No. with Associated Symptom	Frequency of Associated Symptom	Total Presenting and Associated Symptoms	Overall Frequency
Neck Swelling	174 (1)† (1)°	47.15	52	14.13	226	61.41
Epistaxis	82 (2)x (1)M	22.22	91	24.73	173	37.01
Nasal Obstruction	33 (1)x (1)M	8.94	85 (1)x (1)M	23.10	118	31.99
Tinnitus	21	5.69	122	33.15	143	38.86
Headache	15	4.06	70 (1)x (1)M (1)°	19.02	85	23.1
Nasal Discharge	8	2.17	33	8.94	41	11.11
Deafness	8	2.17	79	21.47	87	23.64
Diplopia	5	1.35	7	1.90	12	3.26
Dysphagia	5 (1)*	1.35	8	2.17	13	3.53
Blood stained saliva	3	0.81	19	5.16	22	5.98
Impaired Vision	2	0.54	12	3.26	14	3.8
Numbness	2	0.54	13	3.53	15	4.08
Hoarseness	3	0.81	5	1.36	8	2.17
Loss of weight	—	—	15 (1)†	4.08	15	4.08
Others	7	1.90	43 (1)* (1)°	11.68	49	13.31
Unknown	1	0.27	4	1.09	5	1.36

Distribution figures refer to all tumours
 Figures in brackets denote Non-Carcinomatous tumours except for the one case without biopsy

()x = Angiofibroma
 ()* = Chordoma
 ()† = Lymphoma
 ()M = Malignant Melanoma
 ()° = Clinically NPC—No biopsy done.

TABLE VI
NASOPHARYNGEAL TUMOURS—SINGAPORE 1969-1971
DURATION OF PRESENTING SYMPTOM

Duration of Symptom	No. Patients	%	Cumulative %
Under 2 weeks	13 (1)x (1)M	3.52	3.52
2 weeks—	24 (1)*	6.50	10.02
1 month—	43 (1)°	11.65	21.67
2 months—	63 (1)M	17.07	38.74
3 months—	57 (1)† (1)x	15.45	54.19
4 months—	47	12.74	66.93
6 months—	38	10.30	77.23
9 months—	21 (1)x	5.69	82.92
12 months—	25	6.77	89.69
18 months and above	35	9.48	99.17
Unknown	3	0.81	99.98
Total No. Patients	369		

Distribution figures refer to all tumours
 Figures in brackets denote Non-Carcinomatous tumours except for the one case without biopsy

()x = Angiofibroma
 ()* = Chordoma
 ()† = Lymphoma
 ()M = Malignant Melanoma
 ()° = Clinically NPC—No biopsy done.

TABLE VII
 NASOPHARYNGEAL CARCINOMA—SINGAPORE 1969-1971
 TNM STAGE AT PRESENTATION (UICC 1968)
 VII A—NO METASTASES
 (M0)

	ON0	N1		N2		N3	Total	% Frequency
		a	b	a	b			
T0	—	—	1	—	—	2	3	0.85
T1	13	1	16	1	9	16	56	15.91
T2	46	3	53	1	47	60	210	59.66
T3	3	—	8	—	4(1) ^o	11	26	7.39
T4	17	1	11	3	11	14	57	16.19
TOTAL	79	5	89	5	71	103	352	
% Frequency	22.44	26.70		21.59		29.26		

()^o = One case with no histological confirmation.

obstruction, headache and then neck swelling as the commoner symptoms.

On combining all symptoms, neck swelling was the commonest complaint, occurring in just over 60% of all patients; with epistaxis in nearly 50%, tinnitus and nasal obstruction each complained of by a third of the patients and deafness by a quarter.

The duration of symptoms before presentation was quite variable. 13 patients claimed symptoms lasting under 2 weeks when they presented. Just over half the patients presented with symptoms under 4 months duration and approximately 83% had the presenting symptom for under a year. 35 patients, however, waited 18 months and longer from onset of the presenting symptom before seeking medical help at hospital. This group represented just less than 10% of all patients in the series.

Extent of Disease

The extent of disease at presentation was coded retrospectively using the T.N.M. classification⁸. Since this classification applies only to carcinomas, the 7 cases with other tumours were excluded. However, as approximately half the patients had no record of skull radiography, the Primary Tumour (T) extent for the series would be understated since bone involvement would have been staged as T4.

352 patients had no distant metastases when first seen and were therefore classified M0. Further classification into T (primary tumour) and N (cervical lymph node involvement) extent for this group is presented in Table VIIA. It will be seen that the majority of patients presented with T2 lesions—210 patients in all or just under

TABLE VII B
 VII B—WITH METASTASES
 (M1)

	N1b	N2b	N3	Total
T0	—	—	—	—
T1	1	—	—	1
T2	—	3	—	3
T3	1	2	—	3
T4	—	1	2	3
TOTAL	2	6	2	10

No M1 cases with ON0, N1a or N2a.

60% of all M0 patients. There is a fairly sharp fall in frequency then to 16% (57 patients) with T4 lesions, 15.9% (56 patients) with T1 lesions and 7.4% (26 patients) presenting with T3 lesions. Only 3 patients (less than 1%) had T0 lesions. The figures for the 4 broad groups into which cervical lymphadenopathy is classified (N0, N1, N2 and N3) show practically an equal distribution of patients. Inspection of the table also indicates there is little correlation between T and N stages.

10 patients presented with distant metastases. The classification of these patients into T and N stages is shown in Table VII B. The numbers are too few for any valid conclusions to be drawn but there would not appear to be any correlation again between T and N stages.

Of the 89 total patients with T3 and T4 lesions, 13 presented with tumours so large as to depress the soft palate whilst 11 had tumours extending anteriorly to the nasal passages and 4 were exophthalmic.

Cranial Radiography

Records of skull radiography were available for 190 of the 366 cases with malignant tumours.

In 60 of these, there was definite bony involvement radiographically and in another 15, involvement was equivocal. As expected the base of skull (including the sphenoid sinus) was the most frequently involved site (66 cases or almost 99% of all cases with skull involvement). There were 3 instances where only the maxillary antrum was involved, 1 instance where antral involvement was combined with extension to the ethmoids and 2 cases with skull base and antral extension. 3 cases had extensive skull bone involvement by tumour. These results are tabulated in Tables VIIIA and VIIIB.

TABLE VIIIA
NASOPHARYNGEAL CANCER—SINGAPORE
1969-1971
SKULL X-RAY EXAMINATIONS

	No.	%
Unknown/Not Done	176	48.10
No involvement	115	31.42
Definite involvement	60	16.39
Equivocal involvement	15	4.10
	75	20.49

TABLE VIIIB
NASOPHARYNGEAL CANCER—SINGAPORE
1969-1971
RADIOLOGICAL EXTENT OF SKULL
INVOLVEMENT

	No.	% Total involved
Skull base including Sphenoid Sinuses	66	88.0
Maxillary Antrum	3	4.0
Ethmoid Sinuses	—	—
Skull base & Antrum	2	2.67
Skull base & Ethmoids	—	—
Antrum & Ethmoids	1	1.33
Other combinations	3	4.0

Cranial Nerve Palsies

78 out of the 366 cases of malignancy in the nasopharynx exhibited cranial nerve palsies.

The most frequently involved cranial nerves were the VI and the IX and X. The IX and X nerves were invariably involved together. Each of these 3 cranial nerves was involved in almost 40% of all patients with palsies. Table IX gives the frequency of palsy that occurred in each of the cranial nerves.

Multiple cranial nerve palsies were common, being seen in 47 cases of the 78 (60.3%). 13 patients had involvement of 4 or more cranial nerves at presentation. The commonest grouping was of the nerves to the ocular muscles (III, IV and VI), 10 patients presenting thus with ophthalmoplegia. This was followed closely by 8 patients who were seen with combined IX, X and XII cranial nerve palsies. 1 patient had involvement of practically all the cranial nerves excepting the I, II, VIII, and XI nerves.

31 patients showed only a sole cranial nerve palsy each. Most frequent involvement was exhibited in the V and VI nerves with 9 patients affected in each instance.

Histopathology

366 cases had biopsies of the nasopharynx performed. 2 of the remaining 3 had biopsies of enlarged cervical lymph nodes reported as "metastatic carcinoma" with the primary probably in the nasopharynx.

1 patient had no histological confirmation of carcinoma. Clinically however there was little doubt of the diagnosis, the patient being a Chinese male in the 40-49 years age group and presenting with a large tumour in the nasopharynx, hard bilaterally enlarged lymph nodes in the upper neck and with palsies of the IX and X cranial nerves.

The 358 biopsies of nasopharyngeal carcinoma were almost all poorly differentiated in histological grade (351 or 98%) only 7 being graded moderately differentiated and none well

TABLE IX
NASOPHARYNGEAL CANCERS—SINGAPORE 1969-1971
CRANIAL NERVE INVOLVEMENT

	VI	IX & X	V	XII	III	IV	VII	XI	VIII	II	I
Patients with Palsy	30	30	25	20	19	14	11	4	3	2	—
Frequency of Palsy %	38.5	38.5	32	25.6	24.4	17.9	14.1	5.1	3.8	2.6	—

No. Patients with Palsy/Palsies = 78
% Total Cancer Patients = 21.31%

TABLE X
NASOPHARYNGEAL TUMOURS—SINGAPORE 1969-1971
HISTOPATHOLOGY OF NASOPHARYNX

	Poorly Differentiated Ca.	Moderately Differentiated Ca.	Malignant Melanoma	Lymphoma	Chordoma	Angiofibroma	Others	Not Done	Total Cases
Biopsies %	351 95.12	7 1.9	2 0.54	1 0.27	1 0.27	3 0.81	1* 0.27	3† 0.81	369

N.B.: * Biopsied twice, negative for malignancy, but lymph node showed "Poorly Differentiated Carcinoma."
 † 2 had lymph node biopsied—"Metastatic Carcinoma."
 † 1 case had no biopsy of any sort—clinically obvious case with bilateral upper neck nodes and cranial IX and X N palsies (T3N 2bM0).

TABLE XI
NASOPHARYNGEAL CANCERS—SINGAPORE 1969-1971
HISTOPATHOLOGY OF CERVICAL LYMPH NODES

	Poorly Differentiated Ca.	Moderately Differentiated Ca.	"Metastatic Carcinoma"	Lymphoma	Chronic Lymphadenitis	Others	Unknown	Total Cases Biopsied
Biopsies % Node Biopsies	37 69.81	2 3.77	7 13.21	1 1.89	2 3.77	1 1.89	3 5.66	53 14.4% of All cancers

differentiated. No reports of "Lymphoepithelioma" were made.

Cervical lymph node biopsies were performed on 53 patients, the results of which are presented in Table XI. As in the distribution for histologic reports on the primary, here too the commonest picture seen was that of poorly differentiated carcinoma (36 cases or almost 70%). 7 cases were reported as "metastatic carcinoma" with no statement of grading though most of these were also reported as probably metastatic from a nasopharyngeal origin. The sole lymphoma patient had positive biopsies from the nasopharynx as well as from a cervical lymph node. In 3 patients, the report of the node biopsy could not be traced. The node biopsies had been done by general surgeons prior to referral to this department. Subsequent biopsies of the post-nasal space were obtained by ear, nose and throat surgeons and were positive for carcinoma.

Associated Pathology

A total of 81 patients had some associated pathology given as past histories, or concomitantly with the nasopharyngeal disease or developing during the course of radiation therapy. 41 patients had respiratory ailments, chiefly healed tuberculous lesions, 12 developed herpes zoster and 8 patients had diseases of the cardiovascular system (hypertension mainly). The 6 patients with cataract had the lesion as a degenerative process, before initiation of irradiation.

TABLE XII
NASOPHARYNGEAL TUMOUR—SINGAPORE
1969-1971
ASSOCIATED PATHOLOGY

	No. of Patients	% of Patients with Associated Pathology
Other Cancers	2	2.47
Diabetes Mellitus	4	4.94
Cardiovascular	8	9.88
Renal	—	—
Respiratory	41	50.62
Herpes Zoster	12	14.81
C.N.S.	3	3.7
Cataract	6	7.41
Spondylosis	6	7.41
Others	18*	22.22
Total No. of patients involved	81	

*1 with Dermatomyositis.

An equal number of patients showed spondylosis mostly in the cervical spine. 9 patients in all had more than 1 associated pathology.

Only 2 patients had other cancers in association. I had an extensive bladder carcinoma concomitant with nasopharynx carcinoma. He had refused surgery and died soon after a palliative course of irradiation to the nasopharynx and neck. The other patient had a preceding papillary carcinoma of the thyroid treated in 1966 by total thyroidectomy followed by suppressive therapy with thyroxine before developing a nasopharyngeal carcinoma. This patient is included in the series of double primary cancers reported by Tan (1974).

One other patient had dermatomyositis.

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