The spectrum of histologically diagnosed malignant neoplasms in Sabah, 1983 – 1988

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Summary

Malignant neoplasms diagnosed histologically in the state of Sabah during the period November 1983 to October 1988 were analysed to determine the distribution of malignant neoplasms according to site, age, sex and major ethnic groups. The five commonest malignant neoplasms in males were carcinomas of the nasopharynx, stomach, skin, lung and liver. In females the five commonest malignant neoplasms were carcinomas of the cervix uteri, breast, ovary, thyroid and skin. There was variation in these frequencies among the major ethnic groups. The most striking of these was the high frequency of nasopharyngeal carcinoma among Kadazan and Chinese males but not in males of the other indigenous groups. A significant number of patients with nasopharyngeal carcinoma was found in the younger age groups and most of the patients in the younger age groups were Kadazans. A relatively high frequency of carcinoma of the stomach, skin and liver was seen among Kadazans and other indigenous groups while carcinoma of the lung was seen relatively frequently among Chinese males. Among females carcinomas of the breast and cervix uteri were the most frequent malignant neoplasms in all the main ethnic groups. Possible reasons for these findings are discussed.

Key words: Malignant neoplasms in Sabah, ethnic frequencies, age variations.

Introduction

The state of Sabah lies in the island of Borneo and forms part of East Malaysia. Whilst West Malaysia has only three main ethnic groups (Malays, Chinese and Indians), the population of Sabah is made up of a multitude of ethnic groups which include the main indigenous groups of Sabah (Kadazans, Najaus and Muruts), other indigenous groups (which include numerous other smaller groups e.g. Rungus, Bisaya, Tidong, Kadayan, Suluk, Orang Sungai, etc), Chinese, Malays and others (which includes Indonesians, Sarawakians, Filipinos and Indians). No population-based cancer registry exists in Sabah. The objective of this study is to obtain some basic information on the patterns of malignant neoplasms in the various age, sex and ethnic groups in the study population.

This study was based on histologically proven malignant neoplasms in the state of Sabah. Hence the data used in this study should have a high degree of reliability compared to studies which include other methods of diagnosis. However a study of this nature is of course inherently biased in favour of sites more accessible to biopsy as in some sites the diagnosis is sometimes made by procedures other than

biopsy. There would therefore have been some underdiagnosis of malignant neoplasms in sites that are relatively inaccessible to biopsy. Since this is a hospital-based study it is also biased by selective utilization by patients. Further the hospital population cannot be related to the entire population and incidence patterns cannot be worked out and only the pattern of malignant neoplasms in terms of relative frequencies can be determined.

Materials and Methods

During the period October 1983 to November 1988 biopsy specimens from all the government hospitals in the State of Sabah were examined histologically in the Division of Histopathology of the Institute for Medical Research, Kuala Lumpur. The specimens were largely received from three major hospitals with a very small number from some small hospitals. Only the histologically proven malignant neoplasms from the three major hospitals were included in this study. These hospitals were the Queen Elizabeth Hospital in Kota Kinabalu, the Duchess of Kent Hospital in Sandakan and the General Hospital in Tawau.

Results

The total number of malignant neoplasms diagnosed histologically during the five year period was 1574. The age, sex and ethnic distribution of these neoplasms is shown in Table I. There were 776 males (49.3 percent) and 798 females (50.7 percent). The majority (82.5 percent) of the patients with malignant neoplasms were over 35 years of age and only 29 (1.8 percent) were in the paediatric age group (i.e. below the age of 12 years).

The ethnic distribution of the total number of hospital patients was only available for 1987 and 1988. The ethnic distribution of malignant neoplasms diagnosed histologically in 1987 and 1988 was compared with that of the total hospital patients in Table II. There was a relatively higher percentage of Kadazans (33.2 percent) and Chinese (26.7 percent) among the patients with malignant neoplasms in relation to their hospital utilization (20.5 percent for Kadazans and 16.2 percent for Chinese). Hence the prevalence of malignant neoplasms in hospital admissions appeared to be highest among the Kadazans and the Chinese. In most of the other ethnic groups there was a relatively lower percentage of the ethnic group among patients with malignant neoplasms in relation to their hospital utilization.

Cancer patterns

The most frequently diagnosed malignant neoplasm was carcinoma. Only 67 (4.3 percent) of the cases were sarcomas.

The ten most common sites of primary malignant neoplasms are listed in Table III. Among males nasopharyngeal carcinoma was the most common malignant neoplasm accounting for 13.8 percent of all malignant neoplasms in males. This was closely followed by carcinoma of the stomach (12.6 percent). The other common sites were skin (10.0 percent), lung (9.3 percent), liver (8.1 percent), lymphoreticular system (7.1 percent), rectum (6.3 percent), colon (5.3 percent), bladder (4.4 percent) and oral cavity (4.2 percent). Among females carcinoma of the breast and carcinoma of the cervix uteri (including carcinoma in situ) were the most frequent malignant neoplasms with each of these accounting for 18 percent of all malignant neoplasms in females. The other common sites were ovary (9.1 percent), thyroid (6.9 percent), skin (5.9 percent), stomach (5.8 percent), colon (5.4 percent), oral cavity (4.4 percent), nasopharynx (4.4 percent) and corpus uteri (4.4 percent).

Table I

Distribution of all patients with malignant neoplasms by age, sex and ethnic group

Age group (Years)	Kadazan		Bajau		Murut		Indigenous		Chinese		Malay		Others*		Total	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Below 1			1												1	
1 – 4							4	3					2	2	6	5
5 – 14	9	4		1		1	1	2	1				3	1	14	9
15 – 24	7	10	1	8	1		6	8	3	2	3		5	13	26	41
25 – 34	18	17	4	16		2	16	21	5	15	5	9	19	27	67	107
35 – 44	24	37	8	18	3		15	18	15	51	3	8	21	38	89	170
45 – 54	69	75	12	20	7	4	26	27	36	43	3	6	25	27	178	202
55 – 64	73	47	10	11	5	1	30	19	58	38	8	5	9	14	193	135
65 – 74	45	33	4	7	2		10	10	55	39	5		6	5	127	94
75 & above	22	14	2				8	1	37	19			6	1	75	35
Total	**267**	**237**	**42**	**81**	**18**	**8**	**116**	**109**	**210**	**207**	**27**	**28**	**96**	**128**	**776**	**798**

**(Includes Indonesians, Sarawakians, Filipinos and Indians)*

Table II

Percentage distribution of all patients with malignant neoplasms by ethnic group compared with total patients for 1987 and 1988

Ethnic group	Total hospital patients		All patients with malignant neoplasms	
	No.	%	No.	%
Kadazan	24016	20.5	242	33.2
Bajau	14242	12.2	70	9.6
Murut	1170	1.0	15	2.1
Other indigenous	17979	15.3	94	12.9
Chinese	18979	16.2	194	26.7
Malay	5844	5.0	22	3.0
Others	34976	29.8	91	12.5
Total	**117206**	**100.0**	**728**	**100.0**

Table III
Ten most common sites of malignant neoplasms by sex

Male			Female		
Site	Number of cases	% of all male cases	Site	Number of cases	% of all female cases
Nasopharynx	107	13.8	Cervix Uteri	144	18.0
Stomach	98	12.6	Breast	144	18.0
Skin (incl. melanoma)	78	10.1	Ovary	73	9.2
Lung	72	9.3	Thyroid	55	6.9
Liver	63	8.1	Skin (incl. melanoma)	47	5.9
Lympho reticular	55	7.1	Stomach	46	5.8
Rectum	49	6.3	Colon	43	5.4
Colon	41	5.3	Oral CAvity	35	4.4
Bladder	34	4.4	Nasopharynx	35	4.4
Oral Cavity	33	4.3	Corpus Uteri	35	4.4
All sites	776	100.0	All sites	798	100.00

Further analysis of the results by ethnic group and sex is shown in Tables IV to VI. This analysis was done only for groups in which an adequate number of cases was found. For this purpose all indigenous groups other than Kadazans were grouped together since Bajaus and Muruts formed only a small percentage of the cases. This analysis was therefore done only for Kadazans (Table IV), all indigenous groups other than Kadazans (Table V) and for Chinese (Table VI).

From Tables IV to VI it can be seen that while carcinoma of the nasopharynx was the most frequent malignancy among Kadazan and Chinese males it was relatively less frequent among males of indigenous groups other than Kadazans. Gastric and skin cancers (including malignant melanoma) however appeared to be fairly frequent among both Kadazan males and males of all indigenous groups other than Kadazans but less among Chinese males. Carcinoma of the lung on the other hand was as frequent as carcinoma of the nasopharynx in Chinese males but not so frequent among males of the indigenous people of Sabah. Among females of all three groups carcinomas of the breast and cervix appeared to be the most frequent carcinomas. Another point to note is that colorectal carcinoma appeared to be relatively frequent among the Chinese but not so among the indigenous people of Sabah.

Age Variations in some malignant neoplasms

The age distribution of patients with fifteen malignant neoplasms in which there are adequately large numbers of cases is shown in Table VII. There was generally an increasing number of patients with increasing age. In nasopharyngeal carcinoma a significant number was found in the younger age groups and most of the patients in the younger age groups were Kadazans (all 8 cases in the 5–14 age group). Carcinoma of the thyroid was also seen to be relatively common in young adults with nearly as many cases occuring in the 15–36 age period as in the 35–54 age period. Lymphoreticular neoplasms also occurred fairly frequently in young adults. For most other malignant neoplasms the general age patterns showed an increasing number with increasing age.

Table VII
Age distribution of patients by selected cancer sites

Site	Age (Years)										
	Below 1	1–4	5–14	15–24	25–34	35–44	45–54	55–64	65–74	75 & above	Total
Nasopharynx			8	13	19	24	41	24	9	5	143
Oesophagus				1	2	1	15	13	14	4	50
Stomach				1	5	13	53	45	15	12	144
Colon				3	6	8	13	26	15	12	83
Rectum				1	11	7	17	14	17	11	78
Liver	1		2	1	6	11	20	20	8	5	74
Lung				2	3	13	21	29	13	10	91
Skin					5	16	38	24	27	15	125
Breast			1		26	43	37	18	17	4	146
Cervix Uteri				3	26	45	38	17	12	3	144
Ovary			2	15	16	14	12	9	4		72
Bladder			1	3	1		5	17	13	3	43
Thyroid			2	10	17	19	12	9	7	3	79
Lympho reticular			3	5	10	23	12	12	8	8	84
Oral Cavity					6	6	17	21	4	3	67
All Sites	**1**	**11**	**23**	**67**	**174**	**259**	**380**	**328**	**221**	**110**	**1574**

Discussion

The most striking finding in this study was the high frequncy of nasopharyngeal carcinoma among Kadazan males and also Chinese males but not in males of the other indigenous groups. Factors currently thought to be of importance in aetiology are: a possible genetic predisposition (Simons, et al.,[1] 1972 and Chen et al.,[1] 1983), an association with the Epstein-Barr virus and the ingestion of carcinogenic substances (Ho,[3] 1975) such as nitrosamines in Cantonese-style salted fish (Fong and Walsh,[4] 1971, Yu, M.C. et al.,[5] 1981, Armstrong, R.W. et. al.,[6] 1983 and Yu, M.C. et al.,[7] 1986). As to the possible genetic predisposition a study of HLA profiles in Kadazans may throw some light on this subject. The Kadazans are also known to consume fairly large amounts of salt fish and it may be worth investigating their diet for carcinogenic substances.

A high frequency of nasophargyngeal carcinoma was seen among young Kadazans. This occurrence is familiar to those handling surgical specimens from Sabah and has been reported (Rothwell, R.I.,[8] 1979). The double peak age incidence in nasopharyngeal carcinoma seen among Kadazans has also been reported from India (Balakrishnan[9] 1975) although this is a population with a low incidence of nasopharyngeal carcinoma. Other countries where this double peak age incidence has been reported are Kuwait (Parikh and El-Ghamarawi,[10] 1978), Greece (Papavasiliou et al.,[11] 1977) and Tunisia (Cammoun et al.,[12] 1974). Although the Chinese as a whole have a high frequency of nasopharyngeal carcinoma Rothwell did not find a high incidence in adolescent Chinese as they did in adolescent Kadazans. Our figures although small support the findings of Rothwell. Shu Yeh,[13] (1962) also did not find a bimodal pattern in the Chinese of Sabah, Singapore, Hong Kong or Taiwan. Balakrishnan and

Gangadharan,[14] (1983) had similar findings. A five-year Malaysian study was done by Yadav et al.,[15] (1984). He found that the proportion of nasopharyngeal carcinoma in young Malaysians less than 20 years old formed 1.2 percent in Chinese, 7.2 percent in Malays and 6.9 percent for others including Kadazans of the total cases seen for each race

Possible reasons for the bimodal age incidence of nasopharyngeal carcinoma among Kadazans have to be considered. Do the Kadazans have some early exposure to a carcinogenic agent? Since the peak occurs at the time of transition from adolescence is there any interaction of hormonal factors with other etiological factors? Whatever the possible reason for this pattern in the age incidence clinical awareness of this is important so that diagnosis and treatment of this fairly aggressive neoplasm can be carried out as early as possible.

There was a relatively high frequency of carcinoma of the stomach among Kadazans and also among the other indigenous groups. Possible reasons of this are not apparent. One wonders whether there is some dietary factor such as the method of food preparation, e.g. roasting or barbecuing which may produce carcinogens, or some factor in the method of food preservation where large amounts of salt or some other chemicals could be used.

Malignant neoplasms of the skin were also seen to occur relatively frequently among Kadazans and the other indigenous groups but less so among the Chinese. As these ethnic groups consist largely of light-skinned people, exposure to tropical sunlight especially in the male population due to their outdoor occupation is probably an important etiological factor.

A relatively high frequency of carcinoma of the liver was seen among Kadazans and the other indigenous groups. The role played by hepatotropic viruses and dietary factors have to be considered. One well known observation is the fact that the indigenous people of Sabah especially the Kadazans consume a large amount of an alcoholic drink called 'tapai' prepared from fermented rice. A possibility that has to be considered is whether the alcoholic content of this drink causes cirrhosis and subsequently carcinoma of the liver. The other possibility that has to be studied is whether the fermentation process involved in the preparation of 'tapai' leads to be formation of other substances, e.g. aflatoxins the ingestion of which can lead to a high incidence of carcinoma of the liver.

Carcinoma of the lung however was seen to occur relatively frequently among Chinese males but not so frequently among males of the indigenous people of Sabah. Whether this is related to the frequency of etiological factors e.g. smoking has to be studied.

Among females carcinomas of the breast and cervix uteri were the most frequent malignant neoplasms in all the main ethnic groups. This finding is similar to what has been observed in studies in West Malaysia.[16, 17]

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