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Profile of Malignant Lesions Amongst Children in North Bengal

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Ethnic differences play a significant role in the incidence, type, response to therapy and mortality rate of some malignant neoplasm. For example, the Chinese Americans revealed a significantly lower mortality in leukemia but a higher mortality rate in non-Hodgkin lymphoma (NHL) than for the Caucasion population(l). It is well known that acute lymphoblastic leukemia in black children is less responsive to therapy than in white. Keeping this in mind and also noticing a very high incidence of retinoblastomas and acute leukemias among children of different ethnic groups in the sub-Himalayan region of North Bengal, this study was conducted.

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Material and Methods

The study was conducted retrospectively among children of less than twelve years of age, in the Department of Pathology of North Bengal Medical College, Darjeeling from January 1983 to June 1992. The catchment area of this Institute consists

of six districts of West Bengal, Sikkim, Bhutan, Nepal, a part of neighbouring state of Assam and Bihar. The analysis was made on already-diagnosed 192 malignant lesions in children of a total 2672 malignancies examined during this period which accounted for 7.3%. Tumors arising from the brain and spinal cord have not been incorporated in this study as a full fledged Neurosurgery Department is not present. Data regarding number of patients were obtained from the record section of the Hospital. The malignant lesions were analysed in relation to: *(a)* age; *(b)* sex; *(c)* pattern different tribals (as Gurkhas, Rajbanshis and Santlials) and non-tribals (Cosmopolitan); *(d)* site of origin of tumor; and *(e)* their microscopical diagnosis.

Results

The maximum number of malignancies were noticed amongst children aged between 1 to 4 years. The male to female ratio was 2:1. Hematological malignancies were the most common (36%) type. Acute leukemia ,was not found below one year of age. The most striking feature was the high incidence of retinoblastoma in this sub-Himalayan zone of West Bengal. It comprised 32.5% of all malignant neoplasms in the children. The minimum and maximum ages at presentation for retinoblastoma were one year and 7 years, respectively. The male female ratio was 2.7:1.5 and one patient showed metastasis in the upper cervical lymph node. The incidence of this malignant eye tumor was the highest among Muslims and none among the Rajbanshis—a particular ethnic group of North Bengal. The incidence and distribution of other malignant tumors arising from different tissues are shown in *Table I.* The distribution among different ethnic groups is shown in *Table II.*

Hill Tribals (Gurkhas): Malignancy among Gurkha children was 11% with a male:female ratio 4.5:1.

Plain Tribals (Rajbanshis): The incidence among Rajbanshsis was 13% and male female ratio 1.6:1. This group did not show any case of retinoblastoma.

Santhals: The incidence was 8% and male:female ratio was 1.3:1. This tribal group represented the minimum number in this study.

Cosmopolitan: This represented the bulk of the study where the incidence of malignancy was 68% with male:female ratio of 2:1. It comprised both Hindus and Muslims of this area.

Discussion

The incidence of malignancy in children is quite low and variable in different studies in India. Shah *et al.(2)* found less than 2.93% among Kashmiri children and Prabhakar *et al.* (3) observed less than 2.75% among Punjabi children. However, they did not include the hematological malignancies in their studies. We found 192 cases out of a total 2672 malignant lesions among the children which included all types of hematological malignancies also. Incidence is defined as the number of cancer cases first diagnosed during one year per lakh population(4). This is best possible where a cancer registry is maintained. However, this study may be taken as a pointer towards the pattern of malignancies among children in North Bengal because of its large drainage area and the only referral centre for cancer detection. Here the diet, environment, race and social customs are quite different from other parts of India.

Leukemias occur throughout the world and the annual mortality rates in different

TABLE I—*Tissue/Organs Involved, Type and Number of Different Malignant Lesions*

Tissue/Organs	No. of cases	Microscopical diagnosis	Distribution of types
Blood	69	Acute leukemia	68
		Chronic myeloid leukemia	1
Eye	59	Retinoblastoma	59
Lymph node	17	Lymphoma	15
		Secondary deposit	2
Bone	13	Ewing's sarcoma and others	7
		Osteosarcoma	6
Soft tissue	10	Neuroblastoma	4
		MFH	3
		Others	3
Kidney	8	Nephroblastoma	8
Testis	7	Malignant teratoma	4
		Others	3
Intestine	3	Lymphoma	3
Ovary	3	Dysgerminoma	3
Others sites	3	Craniopharyngioma, Sarcoma botryoides, Follicular carcinoma	3

MFH = Malignant fibrous histiocytoma. Figures in parentheses show the total number of cases examined.

countries are variable. Lower death rates are reported in some developing countries but this probably reflects inadequate medical services and possibly faulty diagnosis. We found 36% of all malignant lesions in children are leukemias with marked preponderance of acute lymphoblastic leukemias.

Retinoblastoma, a rare embryonic tumor occurs in children and the incidence is very high (32.5%) in North Bengal. The incidence has been estimated to be about 1 in every 17,000 to 34,000 live births(5) and is progressively approaching 1 in 15,000 live births(6). This malignant eye tumor runs in families and a higher incidence is associated with older paternal age. No ethnic group is spared from retinoblastoma. Daan *et al.* (7) observed that older parental age develops increased mutation frequency in their germinal cells leading to increased risk of offspring affected with hereditary retinoblastoma. Tribals mostly marry earlier and also give birth to children earlier. However, this high incidence on one side and possible(?) absence in a particular ethnic group (Rajbanshi) necessitates comprehensive epidemiological and genetic studies to exclude possible clustering of abnormal gene(8).

Ghosh *et al.* (9) reported that 6.1% of all

TABLE II—*Age, Sex and Distribution Amongst Different Ethnic Groups*

Age (Years)		Gurkhas (22)		Rajbanshis (26)		Santhals (16)		Cosmopolitan (128)		Total
		M (18)	F (4)	M (16)	F (10)	M (9)	F (7)	M (84)	F (44)	192
0-1	a	-	-	-	-	-	1	3	3	7
	b	-	-	-	-	-	-	-	-	-
1-4	a	3	1	3	2	5	1	26	16	
	b	-	-	-	-	-	-	-	7	73
4-7	a	3	1	2	1	1	3	10	2	
	b	3	-	1	1	4	-	4	2	35
7-10	a	2	-	4	-	1	1	8	2	
	b	1	1	1	2	-	1	8	3	35
10-12	a	1	-	3	3	-	-	6	5	
	b	5	1	2	1	1	-	10	4	42

M=Male, F=Female, a=Non-hematological malignancy, b=Hematological malignancy.
Figures in parentheses showing number of cases.

malignancies in adults in North Bengal were lymphoreticular malignancies and only two were children. We found 7.7% all malignant lesions in children are lymphoreticular in origin (Hodgkin and non-Hodgkin) which affirms the statement that incidence of lymphoma shows a gradual increase throughout the world(10). Most of these were well differentiated lymphocytic variety of non-Hodgkin lymphoma.

The other malignant tumors comprise 22.7% and were distributed evenly among children of different tribal and non-tribal groups.

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Isolation Rate of Enteroviruses vis-a-vis Number of Samples and Mode of Collection

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Acute paralytic poliomyelitis is essentially a clinical diagnosis. The clinical diagnosis in a large number of cases of paralytic poliomyelitis is not confirmed by laboratory investigations. Absence of virology laboratory and a straightforward, clearcut clinical presentation are the main reasons for lack of laboratory support.

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For isolation of polio and other enteroviruses, the commonest clinical material required to be collected is feces. This is obtained in the form of voided stool. In recent years, collection of feces is practised by Anal Tube Technique. It is a considerable improvement over rectal swab technique. Anal tube technique has advantages of simplicity and rapidity especially under "field" conditions.

A study to compare the rate of isolation of viruses from fecal material collected by two methods namely Voided Stool Sample Technique (VSST) and Anal Tube Technique (ATT) was undertaken on cases of paralytic poliomyelitis.

Material and Methods

Anal tube (AT) is a thick hollow glass tube of 125 mm in length and 0.5 mm in diameter with smoothed edges. The sterile AT was lubricated with sterile glycerine and gently introduced in the anal canal up to 20 to 30 mm, rotated and was gradually withdrawn. The AT was then placed inside a stoppered tube containing 3 ml of minimum essential medium. Voided stool sample was collected in a sterile container. From 116 clinical cases of paralytic poliomyelitis, multiple samples (2 to 7) were obtained by