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Spectrum of pediatric tumors: A study from tertiary care centre

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ABSTRACT

Background

The spectrum of tumors in pediatric age group varies considerably from that of adult age group. The incidence of pediatric tumor is increasing in trend.

Aims

A retrospective observational study was conducted in our department to evaluate the changing spectrum of malignancy in pediatric population.

Methods

The hospital data of past 5 years [from January 2011 to December 2015, were analyzed for malignancy occurring in cohort of pediatric age group less than or equal to 14 years of age and it was compared to data from India and United State.

Results

The pediatric population divided in 3 cohorts according to age 0-4 years (20.4%), 5-9 years (33.7%) and 10-14 years (45.9%). The incidence of pediatric tumors is higher in male as compared to female. The most common childhood malignancy is leukemia.

Conclusion

Population based surveillance as well as many etiological studies are needed to determine the parameters and changing pattern of pediatric malignancy. It is an urgent need of to develop a dedicated national pediatric tumor registry program.

Keywords: Pediatric tumors; Trend; Surveillance; Registry program

INTRODUCTION

The incidence of childhood malignancy is increasing all over the world. It comprises a small percentage of the overall global tumor burden but they present a challenging diagnostic and therapeutic problem. In developed countries, the second most common cause of mortality is malignancy accounting about 12.3% in comparison

to major cause of death in Indian children after malnutrition and infection.

The spectrum of tumors in pediatric age group varies considerably from that of adult age group. The change in spectrum is also associated with environmental and genetic factors. As hospital registries are the only available source of information for assessing the disease pattern in

community, we conducted this retrospective study based on our hospital records of past five years.

MATERIALS AND METHODS

This is a retrospective observational study conducted in the Department Of Radiation Oncology of a tertiary care center of North India to analyses the spectrum of tumors in pediatric age group less than 15 years old in accordance to the classification proposed by Birch and Marden.[5] The records of all the tumors diagnosed in children <15 years of age during a period of 5 year from January 2011 to December 2015 were retrieved and Analyzed. Comparison with Indian and international registries was done.

RESULTS

There were eight thousand six hundred and eighty five cases registered in Radiation Oncology

Department during last five years, out of which two hundred and fifty five were pediatric tumors. The pediatric tumors comprised of 2.93% of all malignancies. Males were affected more than females, there were 194/255 male cases compared to 61/255 in females yielding male to female ratio of 3.18. The pediatric population divided in 3 cohorts according to age 0-4 years (20.4%), 5-9 years (33.7%) and 10-14 years (45.9%). The incidence of tumor varied among different age groups. The lowest incidence was seen in 0-4 years of age group and highest incidence is seen in 10-14 years of age group. A total of 84 patients (20:32:32) developed leukemia. In the three groups, most common cancer was leukemia. The second most common cancer in 0-4 year age group was retinoblastoma, whereas brain tumors were second common tumors in 5-9 and 10-14 year age groups (Table-1).

Table 1- Distribution of childhood cancer according to age group and gender.

	0-4 years	5-9 years	10-14 years	Males	Females
Leukemia	20	32	32	70	14
Lymphoma	2	9	21	25	07
CNS	6	20	26	40	12
SNS	2	1	3	05	01
Retinoblastoma	8	1	0	06	03
Renal	9	4	0	10	03
Hepatic	1	0	0	01	00
Bone	1	3	8	09	03
STS	4	6	10	13	07
GCT	0	2	1	02	01
Carcinomas	0	0	10	06	04
Others	2	5	6	08	05
Total	54	84	117	195	60

Table 2-Indian and International Registries of Pediatric Malignancy

	Present Study	India (1)	US(2)
Leukemia	32.9	6.57	28
Lymphoma	12.5	11.58	13
CNS	20.4	31.08	18
SNS	2.0	2.56	5
Retinoblastoma	3.5	14.10	2
Renal	5.5	4.16	4
Hepatic	0.4	0.96	1
Bone	4.7	8.33	4
STS	7.8	11.85	7
GCT	1.2	1.12	7

Others	5.1	4.8	5
Others carcinoma	4.0	2.88	6

DISCUSSION

Arora et al showed that the incidence of pediatric cancer in India varies in between 1.6-4.8% and so in the present study the incidence is 2.93%. The proportion of childhood cancers seems to be high compared to that of developed countries, it might be due to difference in the proportion of pediatric and young age group in India and western countries. The incidence of malignancy is more in male as compared to females. In the present study the male: female ratio is 3.18, which is comparable to other cancer registries. [1], [2], [4]

In present study, leukaemias are the commonest form of childhood malignancies and together with lymphoma, constitute 44.5% of all malignancies. Literature from other Indian and western literature has also shown that haematological malignancies are the most common form of childhood malignancies. [2], [4]

In this study the incidence of leukemia is more in early age group as compared to 10-14 years. The majority of embryonal tumors (neuroblastoma, hepatoblastoma, nephroblastoma, retinoblastoma, rhabdomyosarcoma and medulloblastoma) occur in children less than 9 years old as compared to group more than 9 years old. Total cases of acute

lymphoblastic leukemia are 84. Out of that 75% cases were from child below 9 years of age group, which are equally divided in 0-4 and 5-9 years age group. The spectrum of non haematological malignancies in three sub groups is very similar to other studies done so far. [1], [2], [6]

Pediatric solid tumors show wide incidence variation among the age groups. Frequency of Wilm's tumor, Retinoblastoma is high in 0-4 years of age group. In children of 10-14 years CNS tumors, lymphomas and soft tissue sarcoma are common. It is a known fact that certain childhood malignancies are more prevalent in younger children less than 5 years, while others mostly occur in an older age group. [7]

CONCLUSION

In addition to malnutrition and infection, children in the developing countries like India are increasingly affected by malignancy, but dedicated registry maintenance of pediatric tumors is lacking. As many of common childhood malignancies are curable there is need to have a dedicated pediatric cancer registry for assessing the magnitude of problem in our country as pediatric tumors show wide variation across cancers.

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