



PATTERN OF CHILDHOOD MALIGNANCY IN CENTRAL INDIA: A THREE YEARS RETROSPECTIVE STUDY

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ABSTRACT

Background: Childhood malignancy although a uncommon medical entity but latest data has shown a rising trend of its incidence. Cancer remains one of the major causes of death in children between 1-15 years. **Objective:** This study was conducted to find out the profile of malignancy in children. **Methodology:** It was a retrospective study conducted in NSCB Medical College; Jabalpur using hospital based cancer registry records from April 2013 to March 2016. All the children below 14 years with confirmed diagnosis of cancer by means of histological or cytological examinations were included in this study and data was statistically analyzed using MS word and SPSS 18. **Results:** We observed that there were total 5200 cases among them 165 were newly confirmed paediatric cases attended outpatient department, in department of oncology at N.S.C.B Medical College and Hospital during these 3 years. All were below 14 years of age. Overall pediatric tumors were 3.17% of total cancers. The frequency of cancer was found to be higher among boys (59.4%) than girls (40.6%) with a ratio of 1.5:1. Majority of the children were from rural areas (82.4%) compared to urban areas(17.6%). As per the socio-economic status majority of belongs to low socio-economic status(92.1%). We observed that Acute Lymphoblastic Leukemia (21.8%), Wilms Tumor (11.18%) And Acute Myeloid Leukemia, Non Hodgkin's Lymphoma, Medulloblastoma (6.061% each) were respectively the commonest childhood cancers among the children attended at the hospital. Other less commonly found tumor were Retinoblastoma (4.24%) followed by CML, Ewings sarcoma, PNET, Sarcoma, Seminoma (3.63% each) and Brain Tumor,Neuroblastoma, Ependymoma, Astrocytoma (2.42% each). **Conclusion:** In this study it was evident that the patterns of malignancy in children attended pediatric and oncology OPD was different from western countries with Acute Lymphoblastic Leukemia as the commonest cancer in infants and children above six years of age and it is 1.8 times more common in male then female. WILMS tumor has increasing trends in our study as compared to previous literature.

KEYWORDS: Cancer Registry, Pediatric Malignancies, Rural, ALL.

INTRODUCTION

Cancer remains one of the major causes of death in children between the ages of 1 –15 years.^[1] Pediatric malignancy are differ markedly from adult cancers in their nature, distribution and prognosis. Pediatric oncologists face unique challenges because treatment with irradiation, surgery and chemotherapy can adversely affect the children's growth and development and also a cause of secondary malignancy. The incidence of childhood cancer and type vary greatly throughout the world. Though lower compared with the incidence of some adult cancers, it comes next to accidents as the leading cause of death among children in the developed world.

The patterns of childhood cancer in America and Europe are almost the same, with leukemia and tumors of the central nervous system accounting for over one-half of the new cases. However, there is a dearth of data on the incidence and patterns of childhood cancer in Africa. Although many papers have been published on this in some African countries,^[2-9] reports on the patterns and incidence of childhood cancer are very few, hence this study is designed with a objective to determine the patterns of childhood malignancy diagnosed a government medical college in central India.

MATERIAL AND METHODS

This is a retrospective study done over 165 patients aged upto 14 yrs in NSCB Medical College, Jabalpur. All children with cancer, aged one to 14 years admitted in

the Department Of Pediatrics And Department Of Oncology diagnosed by means of histological or cytological examination and from april 2013 to march 2016 were included.

Data was collected and analyzed using hospital records and the patterns of cancer were studied focusing on the prevalence of tumors according to age, sex, geographic and ethnic distribution and relating the cancer to environmental and genetic causative factors. Data was statistically analyzed using MS word and SPSS 18.

RESULTS

We observed that Acute Lymphoblastic Leukemia (21.8%), Wilms Tumor (11.18%) And Acute Myeloid Leukemia, Non Hodgkin's Lymphoma, Medulloblastoma (6.061% each) were respectively the commonest childhood cancers among the children attended at the hospital. Other less commonly found

tumor were Retinoblastoma (4.24%) followed by CML, Ewings sarcoma, PNET, Sarcoma, Seminoma (3.63% each) and Brain Tumor, Neuroblastoma, Ependymoma, Astrocytoma (2.42% each) (table 1).

The frequency of cancer was found to be higher among boys (59.4%) than girls (40.6%) with a ratio of 1.5:1 (table 2). Majority of the children were from rural areas (82.4%) compared to urban areas (17.6%) (table 3). As per the socio-economic status majority of belongs to low socio-economic status (92.1%). (table 4).

As per age, incidence of malignancy in infants (<1 year of age) ALL is commonest, in children of 1-5 years of age WILMS tumor is commonest and again in children of, 6-14 years ALL is most common malignancy diagnosed at our hospital in a three years retrospective study. (TABLE 6).

Table 1: Percentage of Type of Tumor As Per Prevalence, Their Division As Per Sex.

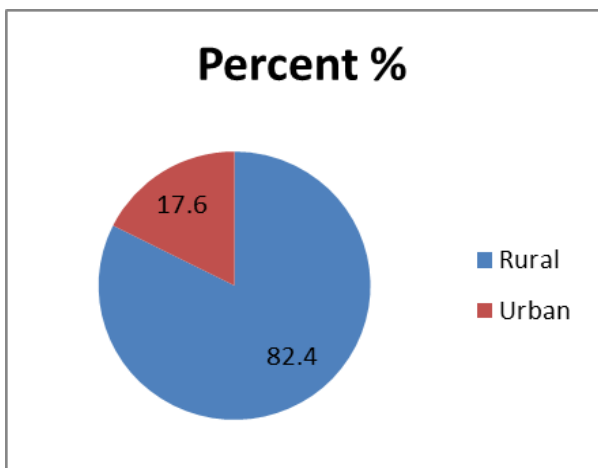
TUMOR TYPE	No of patient	Male	Female	% (n=165)	Male (%)	Female (%)
Acute lymphoblastic leukemia	36	18	18	21.81%	50.00%	50.00%
Wilms tumor	19	11	8	11.51%	57.89%	42.10%
Medulloblastoma	10	8	2	6.061%	80.00%	20.00%
Non Hodgkin's lymphoma	10	7	3	6.061%	70.00%	30.00%
Acute myeloid leukemia	10	8	2	6.061%	80.00%	20.00%
Retinoblastoma	7	4	3	4.242%	57.14%	42.85%
Chronic myeloid leukemia	6	4	2	3.636%	66.66%	33.33%
Ewing sarcoma	6	3	3	3.636%	50.00%	50.00%
Primitive neuro-ectodermal tumor(PNET)	6	5	1	3.636%	83.33%	16.67%
SarcomaA	6	3	3	3.636%	50.00%	50.00%
Astrocytoma	4	3	1	2.424%	75.00%	25.00%
Brain tumor	4	3	1	2.424%	75.00%	25.00%
Ependymoma	4	2	2	2.424%	50.00%	50.00%
Neuroblastoma	4	1	3	2.424%	25.00%	75.00%
Seminoma	3	3	0	1.818%	100.00%	0.00%
Hodgkins lymphoma	4	3	1	1.82%	75.00%	25.00%
Osteoma	2	0	2	1.212%	0.00%	100.00%
Renal cell carcinoma	2	2	0	1.212%	100.00%	0.00%
Sacrococcygeal teratoma	2	1	1	1.212%	50.00%	50.00%
Spindle cell tumor	2	1	1	1.212%	50.00%	50.00%
Laryngeal carcinoma	1	1	0	0.606%	100.00%	0.00%
Lung carcinoma	1	0	1	0.606%	0.00%	100.00%
Ovarian carcinoma	1	0	1	0.606%	0.00%	100.00%
Germinoma	1	0	1	0.606%	0.00%	100.00%
Hemangioma	1	0	1	0.606%	0.00%	100.00%
Pineoblastoma	1	0	1	0.606%	0.00%	100.00%
Rhabdomyosarcoma	1	1	0	0.606%	100.00%	0.00%
Rhabdomyoma	1	0	1	0.606%	0.00%	100.00%
Round cell carcinoma	1	0	1	0.606%	0.00%	100.00%
Teratoma	1	1	0	0.606%	100.00%	0.00%

Table 2: Prevalence of carcinoma as per sex of patient

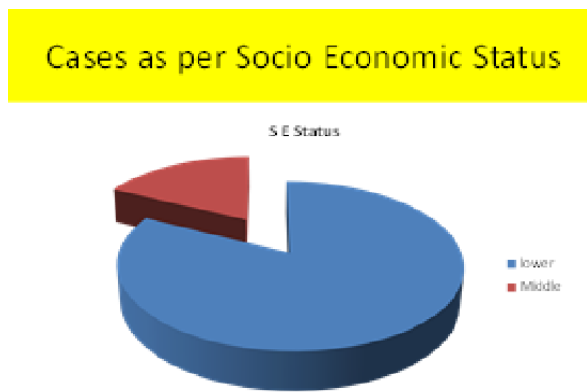
GENDER	MALE	FEMALE
NO.(n=165)	99	66
%	82.5	17.5
RATIO	M:F 1.5:1	

Table 3: Prevalence Of Carcinoma As Per Setting (Rural/Urban)

SETTING	RURAL	URBAN
NO.(n=165)	136	29
%	82.4	17.6



GRAPH 1 : prevalence of carcinoma as per setting (rural/urban)



Graph 2: Prevalence of Carcinoma As Per Socioeconomic Status.

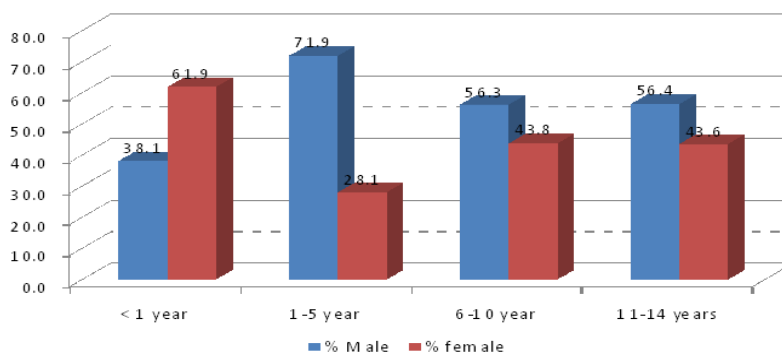
Table 4: Prevalence Of Carcinoma As Per Socioeconomic Status

	Low	Middle
No(n=165)	152	13
%	92.1%	7.9

Table 5:

AGEWISE CLASSIFICATION OF CASES						
Age Group	No of Cases	Male	Female	% of total Cases(n=165)	% Male	% female
< 1 year	21	8	13	12.7	38.1	61.9
1-5 year	57	41	16	34.5	71.9	28.1
6-10 year	48	27	21	29.1	56.3	43.8
11-14 years	39	22	17	23.6	56.4	43.6
Total	165	98	67	100.0	59.4	40.6

Sex wise prevalence of Cases in age Groups



Graph 3: Sex wise prevalence of cases in age groups.

Table 6: Age Group Wise Incidence of Tumour.

AGE GROUP	MOST COMMON TYPE
<1 year	ALL (24%)
1-5 year	WILMS (19%)
6-10 year	ALL 23%
11-14 years	ALL (28%)

DISCUSSION

Our study reveal that almost all kind of tumor can affect the paediatric population as the adult one. Although the exact etiology of childhood cancers is largely unknown, a few conditions can be explained with specific chromosomal and genetic abnormalities, and ionizing radiation exposure. Environmental causes have long been suspected by many scientists but have been difficult to determine because it is difficult to identify past exposure levels in children particularly during potentially important periods such as pregnancy or even the time prior to conception. In addition, each of the distinctive types of childhood cancers develops unique clinical course in terms of age, race, gender and many other factors.^[1]

It has been shown in a Indian study by Muzaffar et al that the the reported prevalence of childhood cancer in boys(1.73:1) is substantially higher than in girls.^[16] The ratio of boys to girls registered with childhood cancer, increased with decreasing gross domestic product and with increasing infant mortality, suggesting that boys are increasingly more likely to be affected than girls with increasing economic disadvantages.^[10] The ratio of boys to girls in our study is 1.5:1 which agrees with the African trend but differs from the trend in western countries where the female to female ratio is 1:1.^[10-12]

Leukemia and Lymphoma were the most common childhood tumors in our geographic area in previous Indian literature.^[16] The results of our study showed that Acute Lymphoblastic Leukemia (21.8%), Wilms Tumor(11.18%) and Acute Myeloid Leukemia, Non Hodgkins Lymphoma, Medulloblastoma with equal frequency(6.061%) were the commonly found childhood cancers among the children attended at hospital during data collection period. Other less commonly found tumor were Retinoblastoma (4.24%), CML, Ewings, PNET, Sarcoma, Seminoma (3.63) And Brain Tumor, Neuroblastoma, Ependymoma, Astrocytoma (2.42%). In this study, acute lymphoblastic leukemia differed from the international trend in that it was more common among the children aged more than five years. However, the gender distribution was similar to the international pattern which has females and males equally affected.

The prevalence of kidney tumors as evident in our study is in accord with the international pattern which shows that the tumor is prevalent in children less than 5 years of age with slight difference in male to female ratio 1.7: 1.

CONCLUSION

In this study it was evident that the patterns of malignancy in children attended pediatric and oncology OPD was different from western countries with Acute Lymphoblastic Leukemia as the commonest cancer in infants and children above six years of age and it is 1.8 times more common in male then female. WILMS tumor has increasing trends in our study as compared to previous literature.

Our study highlights that there is a further need of research to determine the annual incidence of different cancers in different age group in children worldwide to determine prevailing mortality and five year survival rates. A detailed study of environmental risk factors projecting to pattern of pediatric malignancy is necessary.

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