

Childhood cancers: Analysis of 1279 cases at Armed Forces Institute of Pathology, Rawalpindi, Pakistan

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Abstract

Objective: To determine the clinicopathological pattern of childhood malignancies registered with a pathology-based tumour registry.

Methods: The descriptive retrospective study was conducted at the Armed Forces Institute of Pathology, Rawalpindi, Pakistan, and comprised data related to all the histologically diagnosed malignant childhood tumours in the institutional tumour registry from January 2009 to December 2018. Data was analysed using SPSS 20 for the site of involvement, age distribution and histological types of tumours.

Results: Of the total 37793 malignant tumours, 1279(3.38%) were in paediatric subjects aged <15 years. There were 820(64.1%) male subjects and 459(35.8%) were female. Lymph node malignancies were the commonest 261(20.4%), followed by eye tumours 251(19.6%), and brain 107(8.3%).

Conclusion: Lymphomas and eye tumours were found to form the main bulk of childhood cancer.

Keywords: Epidemiology, Malignancies, Lymphoma, Retinoblastoma. (JPMA 70: 1009; 2020)

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Introduction

Cancer in children is a very fatal disease and accounts for an estimated 80,000 deaths worldwide.¹ Incidence is reported as 14.1 cases per 100,000 children.² In a study done in Lahore, leukaemia and lymphoma, followed by cancer of the central nervous system (CNS), were the most common tumours in children.³ In developed countries, such as the United States (USA), the United Kingdom (UK) and the rest of Europe, cancer incidence varies between 120 and 180 cases per million.⁴ In developing countries, paediatric malignancies account for 4.1% to 12.6% of all malignant tumours.⁵ It is found that the pattern of childhood tumour is different compared to the adults. In different geographical areas and ethnic groups, different causative agents have been implicated.^{6,7} In developing countries, lymphoma and leukaemia are the most frequent and this has also been reported in studies done in Pakistan.^{3,8} Leukaemia is also reported to be the commonest malignancy in some European studies, but lymphoma is not as common.⁹ The signs and symptoms depend on the location of malignancy, abdominal tumour often presenting with pain, vomiting, constipation or intestinal obstruction. Lymphoma usually presents with lymphadenopathy, cervical lymph nodes being the most frequently involved.¹⁰ Childhood cancer may mimic many other diseases as well, so the diagnosis may be delayed leading

to late diagnosis and poor outcome. The current study was planned to find out the clinicopathological pattern of childhood malignancies at our institution.

Materials and Methods

The descriptive retrospective study was conducted at the Histopathology Department of the Armed Forces Institute of Pathology (AFIP), Rawalpindi, Pakistan, and comprised data related to all the histologically diagnosed malignant childhood tumours in the institutional tumour registry from January 2009 to December 2018. AFIP is a tertiary care referral laboratory receiving samples from military hospitals as well as civilians, public and private-sector hospitals from upper Punjab, Khyber Pakhtunkhwa (KP) and the adjacent Rawalpindi-Islamabad region. After approval from the institutional ethics committee, data was retrieved from the AFIP tumour registry. The registry is electronically generated when a malignant tumour is diagnosed and registered. All the malignant tumours of paediatric age group registered in the tumour registry were included. Cases without exact site, registered as site not otherwise specified (NOS) were excluded. Each malignant tumour diagnosed was assigned an International Classification of Diseases-in Oncology (ICD-O) code, published by the International Agency for Research on Cancer (IARC).¹¹ The malignant tumours were calculated for each year, for gender distribution, age groups etc. Data was analysed using SPSS 20.

Results

Of the total 37793 malignant tumours, 1279(3.38%) were

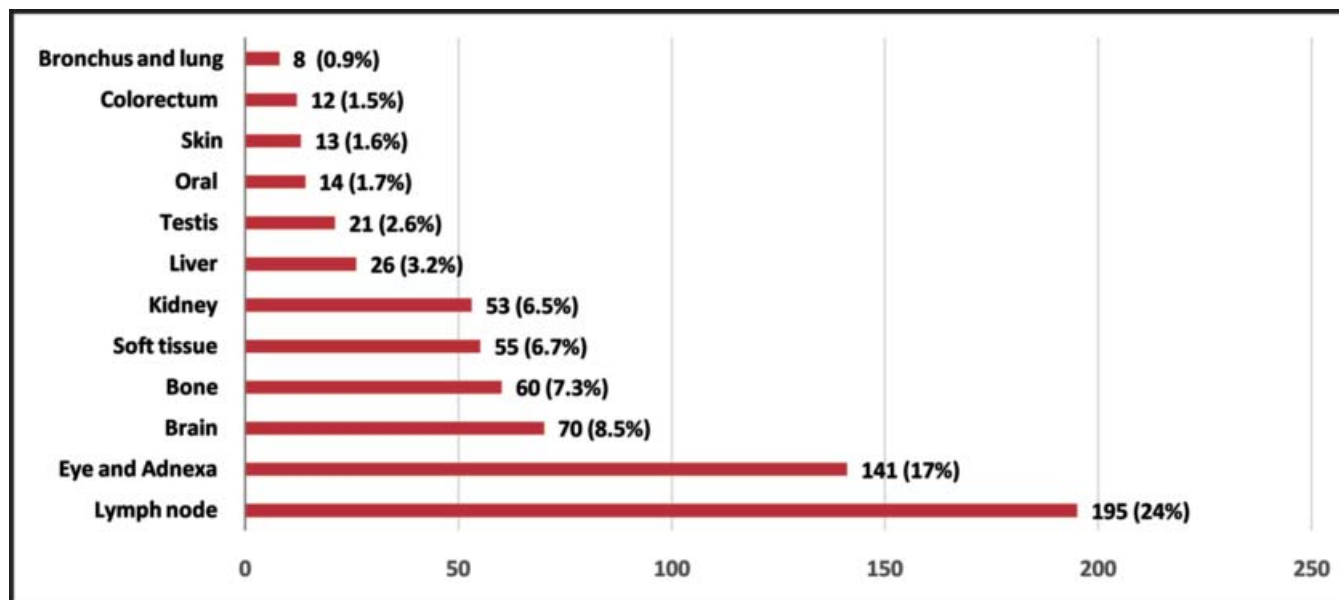
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Table: Top most common malignant tumours in different age groups of children.

0-4 Year age group				
S.No	Males (n=275)	n top 5 (%age)	Females (n=196)	n top 5(%age)
1	Eye + adnexa	92 (33.4%)	Eye + adnexa	81 (41.3%)
2	Kidney	32 (11.6%)	Kidney	31 (15.8%)
3	Lymph node (HD / NHL)	28 (10.1%)	Lymph node (HD/ NHL)	13 (6.6%)
4	Brain	16 (5.8%)	Brain	10 (5.1%)
5	Soft tissue	14 (5.0%)	Peritoneum & retroperitoneum	07 (3.4%)
5-9 Year age group				
S.No	Males (n=270)	n top 5 (%age)	Females (n=118)	n top 5 (%age)
1	Lymph node (HD/ NHL)	94 (34.6%)	Lymph node (HD/ NHL)	30 (25.4%)
2	Eye + adnexa	38 (14%)	Eye + adnexa	17 (14.4%)
3	Brain	28 (10.3%)	Brain	14 (11.8%)
4	Kidney	15 (5.5%)	Bones & joints	7 (6%)
5	Soft tissue	13 (4.8%)	Kidney	7 (6%)
10-14 Year age group (n=356)				
S.No	Males (n=275)	n top 5 (%age)	Females (n=145)	n top 5 (%age)
1	Lymph node (HD/ NHL)	73 (26.5%)	Bones & joints	28 (19.3%)
2	Bones & joints	48 (17.4%)	Lymph node (HD/ NHL)	23 (15.8%)
3	Soft tissue	28 (10.1%)	Ovary	14 (9.6%)
4	Brain	26 (9.45%)	Soft tissue	13 (8.9%)
5	Eye + adnexa	11 (4.0%)	Brain	12 (8.2%)

HD: Hodgkin disease; NHL: Non-Hodgkin lymphoma.

**Figure-1:** Ten commonest tumours in male children (n=820).

in paediatric subjects aged <15 years; 820(64.1%) males and 459(35.8%) females. Lymph node malignancies were the commonest 261(20.4%), followed by eye tumours 251(19.6%), and brain 107(8.3%). In males, lymphomas

topped the list of 10 most common tumours (Figure-1), while in females, eye and adnexal tumours were on top (Figure-2). The difference in age subgroups were noted separately (Table).

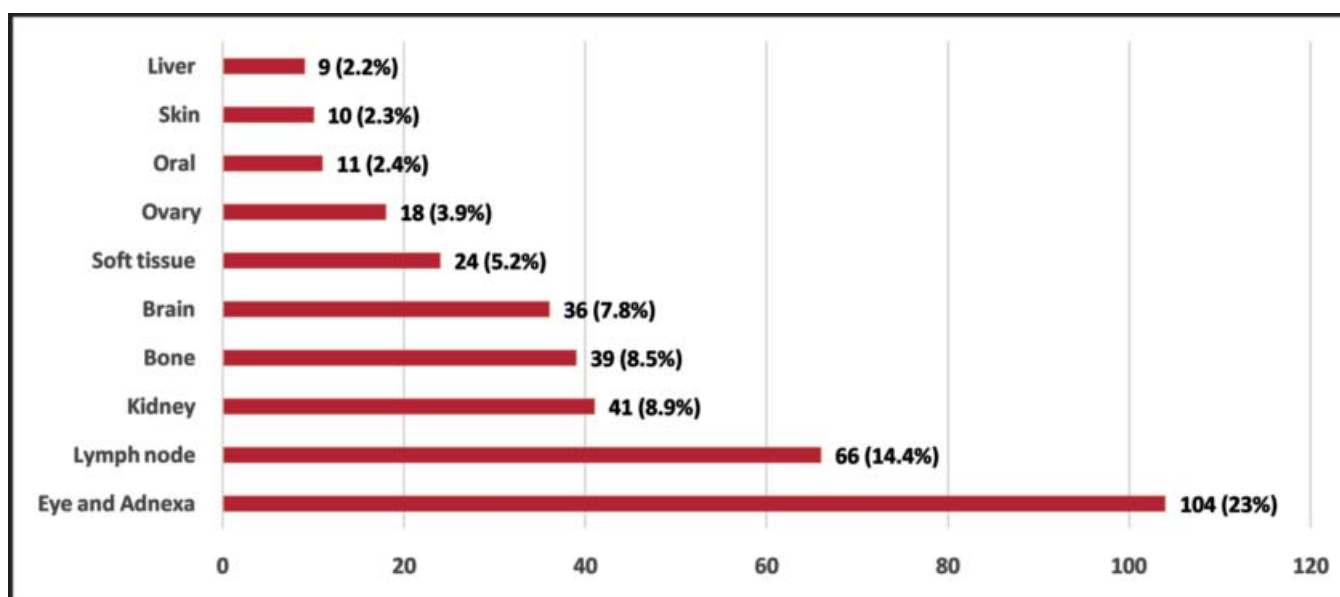


Figure-2: Ten commonest tumours in female children (n=462).

Discussion

About 2% of all cancers occur in children.² In the developed countries, the incidence of 140.6 per million person year in children is reported.¹² In UK, <1.0% of new cases are in children.⁷ In developing countries, these tumours constitute 4.1-12.6% of all malignancies.¹³ A recent Pakistani study reported the incidence as 5.6%.³ In the present study the incidence was 3.4%. In majority of the series, males are reported to be more frequently affected than females and this was also observed in the present study.^{8,14} Lymphomas were the most frequent tumours in males, and were second most common in females which was slightly different to a previous analysis.¹⁵ Other national studies and those from developing countries show lymphoma and leukaemia in children to be the most frequent.^{8,16} In sub-Saharan Africa, the frequency of lymphoma is high in children due to a high incidence of Burkitt lymphoma, whereas in the present study, diffuse large B cell type of lymphoma was more frequent. Burkitt lymphoma is less frequent, and even some of the cases found show the presentation of non-endemic type Burkitt lymphoma, involving abdominal organs and gonads rather than classical presentation of the jaw.¹⁰ It is said that immunosuppressive effect of repeated bacterial and viral infections may be contributory to the development of non-Hodgkin's lymphoma (NHL) in developing countries.¹⁷ The importance of this factor requires to be scrutinised further. Eye and adnexal tumours were found in the present study as among the commonest tumours in

female children and were the second most common in males. The bias of getting more specimens from an eye hospital draining in this institute may be a factor. Bone and CNS tumour, particularly in those aged 10-14 years, were also quite frequent as was observed previously.¹⁵ Majority of childhood malignancies were reported in 5-9 and 10-14 years age groups as was also reported earlier.⁸

Those below 4 years of age showed predictable pattern in both genders in the current study. Lymphoma was the main tumour in this age group. Blastoma group of tumours, including retinoblastoma, nephroblastoma and neuroblastoma, were the next commonest and the same was reported in earlier observations.^{8,14,15,18,19} The pattern of five commonest tumours in both males and female of 5-9 years age group showed main lesion as lymphoma in both genders. This was followed by tumours of CNS, bones and eye in different frequencies. The pattern was same as observed previously, except that ovarian tumours were not in the top five female paediatric malignancies.^{8,15,18,19} Maximum cases were seen in those aged 10-14 years. In males, lymphomas were the main lesions, accounting for about 1/3 of the all tumours in this age group. Bone tumours were on top of females in this age group. CNS tumours were found in top 5 as was the case in other studies.^{8,10,18,19} In females, the rest of the pattern was the same as observed previously, and ovarian tumours were included in the top five tumours in this age group.^{8,10}

Extensive collaborative studies are recommended in

order to find out any causative agent of lymphoma.

Conclusion

Lymphoma, eye and adnexal tumours constituted more than one-third of all paediatric tumours.

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Conflict of Interest: None.

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