Original Article

DISTRIBUTION OF CHILDHOOD MALIGNANCIES AT COMBINED MILITARY HOSPITAL, RAWALPINDI

Muhammad Zeeshan Saleem, Muhammad Zia ul Haq, Shahida Badsha*

PNS Rahat Karachi, *Army Medical College Rawalpindi

ABSTRACT

Objective: To document distribution of childhood malignancies among Paediatric Oncology patients.

Study design: Descriptive study

Place and duration of study: Department of paediatric oncology, Combined Military Hospital, Rawalpindi from June 2006 to May 2007.

Methodology: We collected data of one hundred and forty one (141) consecutive newly diagnosed paediatric oncology patients. Demographics (age and gender) and types of malignancy (diagnosed on histopathology) were collected in all cases.

Results: Of the total patients 90 were male, 51 female with a male to female ratio of 1.76. Childhood malignancies found were leukaemia (60.3%) lymphomas (11.3%), bone tumours (4.3%), brain tumours (2.8%), germ cell tumours (3.5%), retinoblastoma (7.1%), neuroblastoma (3.5%), Wilms tumour (2.8%), rhabdomyosarcoma (2.1%), hepatoblastoma (1.4%) and synovial sarcoma (0.7%). Mean age at diagnosis was 5.4 ± 3.05 years. 24(17%) patients were from Punjab, 9(6.4%) from Sindh, 82(58.2%) from Khyber Pakhtunkhwa, 5 (3.5%) from Baluchistan and 21 (14.9%) from AJK.

Conclusion: This study showed that leukemia is the commonest childhood malignancy. Our research findings are useful for prioritizing future childhood cancer research needs.

Keywords: Childhood, Malignancy, Leukemia.

INTRODUCTION

Only about 1% of new cancers occur in children aged 19 years or younger, yet children dying of cancer lose an average of 69.5 years of life, a span far exceeding the average loss from any adult cancer. The exact etiology of childhood malignancies is unknown but certain host and environmental factors (ionizing radiations, oncogenic viruses, parental occupational chemical exposure, chemotherapeutic agents and pesticides) may be involved in the pathogenesis[1].

Childhood malignancies differ considerably from adult malignancies in both prognosis and distribution by histology and tumour site, and paediatric cancers are generally more responsive to therapy than adult cancers[2]. But due to inadequate diagnostic facilities and lack of health education they are diagnosed at an advanced stage when treatment is either impossible or very difficult[3]. There are no population based cancer registries in Pakistan except Karachi Cancer Registry (KCR) and no data from Punjab is available as far as the frequencies of different cancers are concerned[4].

The incidence of malignancies varies according to gender, age and geography. Boys are more commonly affected by cancers than girls and the rate of malignancies is higher in adolescents than in children[5].

Treatment of cancer is and has been relatively neglected in developing countries. The study into demographic and regional distribution of childhood neoplasms may provide important clues towards their etiology.

MATERIALS AND METHODS

This descriptive study was carried out at department of paediatric oncology, Combined Military Hospital (CMH) Rawalpindi from June 2006 to May 2007.

The Department of paediatric oncology, Combined Military Hospital, Rawalpindi is a tertiary care centre and deals with majority of paediatric oncology referrals from Punjab and Khyber Pakhtunkhwa (KP) regions as well as

Correspondence: Lt Cdr Muhammad Zeeshan Saleem, Child Specialist, PNS Rahat Karachi
Email: khalidrahimk@yahoo.com
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peripheral military hospitals all over the country.

All children below 12 years of age having definitive tissue diagnosis of malignancy who reported to pediatric oncology unit, Combined Military Hospital Rawalpindi, were included in the study. Patients who had received treatment at another oncology unit or who were diagnosed clinically in the absence of conclusive histopathological or cytological evidence were excluded from our study. The total number of patients selected through non-probability convenient was 141. Age, gender and histopathological diagnosis were recorded for all newly diagnosed patients.

The data was entered in SPSS version 10.0. Frequency and percentages were calculated for qualitative data (gender, type of malignancy and area of residence). Quantitative data (age) was reported as mean and standard deviation (SD).

RESULTS

The total number of patients was 141. Males were 90 (64%) and females were 51 (36%) with a male to female ratio of 1.76. Mean age was 5.4 ± 3.05 years. 24 (17%) patients were from Punjab, 9 (6.4%) from Sindh, 82 (58.2%) from Khyber Pakhtunkhwa, 5 (3.5%) from Baluchistan and 21 (14.9%) from AJK.

Childhood malignancies found were leukaemia 85 (60.3%), lymphoma 16 (11.3%), bone tumours 6 (4.3%), brain tumours 4 (2.8%), retinoblastoma 10 (7.1%), neuroblastoma 5 (3.5%), nephroblastoma 4 (2.8%), rhabdomyosarcoma 3 (2.1%), hepatoblastoma 2 (1.4%), synovial sarcoma 1 (0.7%) and germ cell tumours 5 (3.5%), as shown in table-1. Acute lymphoblastic leukemia was the commonest among leukemias. Ewing sarcoma and osteosarcoma were the common bone tumours identified. Medulloblastoma was the commonest brain tumour followed by glioma.

Table-1: Frequency of childhood tumors (n=41).

Malignancy	Frequency	Percentage
Leukaemia	85	60.3
Lymphoma	16	11.3
Bone tumors	06	4.3
Brain tumors	04	2.8
Retinoblastoma	10	7.3
Germ cell tumor	05	3.5
Wilms tumor	04	2.8
Rhabdomyosarcoma	03	2.1
Neuroblastoma	05	3.5
Synovial sarcoma	01	0.7
Hepatoblastoma	02	1.4

Table-2: Gender distribution of childhood tumors

Malagancy	Male (n=90) Frequency (%)	Female (n=51) Frequency (%)	Total (n=141) Frequency (%)
Leukaemia	58 (64)	27 (52.9)	85 (60.3)
Lymphoma	12 (13.3)	04 (7.8)	16 (11.3)
Bone tumors	02 (2.2)	04 (7.8)	6 (6.4)
Brain tumors	01 (1.1)	03 (5.9)	4 (2.8)
Retinoblastoma	03 (3.3)	07 (13.7)	10 (7.3)
Germ cell tumors	03 (3.3)	02 (3.9)	5 (3.5)
Wilms tumors	03 (3.3)	01 (2)	4 (2.8)
Rhabdomyosarcoma	02 (2.2)	01 (2)	3 (2.1)
Neuroblastoma	04 (4.4)	01 (2)	5(3.5)
Synovial sarcoma	01 (1.1)	0 (0)	1 (0.7)
Hepatoblastoma	01 (1.1)	01 (2)	2 (1.4)

DISCUSSION

Leukemia was found to be the most common malignancy in children. Males were more commonly affected. Acute lymphoblastic leukemia was most common followed by acute myeloid leukemia and chronic myeloid leukemia. This was in agreement with all major studies done regionally and internationally[6,7]. In a study conducted by Li J et al, leukemia was the most common childhood cancer[5]. Rehman et al and Hanif et al noted male preponderance in most of the malignant tumors[8,9]. Increase in exposure to environmental factors and preferential treatment of male members in our society may be the reasons for this difference in male to female ratio.

Lymphoma was found to be the second most common childhood malignancy after leukemia, Shah et al from Pakistan reported that lymphoma was the most common malignant solid tumor in children[10]. Retinoblastoma was the third most frequent malignancy in our study. Frequency of retinoblastoma patients was high in our study as compared to other studies conducted locally and internationally[10,7]. Medulloblastomas and glial tumors were the most common tumors identified in our study.Hanif et al and Qureshi et al evaluated pattern and frequency of intracranial tumours in children and also concluded similar results in their studies[9,11].

Ewing sarcoma and osteosarcoma were most common bone tumors in our observation. Rhabdomyosarcoma was the most common soft tissue sarcoma in our study. Shahzad et al analyzed soft tissue sarcoma patients and found out that rhabdomyosarcoma comprised more than 50% of all soft tissue sarcomas in children[12].

Mean age at diagnosis of malignancy in our study was comparable with the results obtained by Yasmeen who reported the mean age of 7 years. Similar results were also obtained by Hanif[13,14]. Majority of the patients (48%) in our study were distributed under four years of age. This might be due to increased frequency of embryonal malignancies under four years of age. Hanif in his study also observed that majority of the patients (77.2%) having intra-abdominal tumor (neuroblastoma, Wilms tumor, lymphoma and miscellaneous) were under 5 years of age[14]. Dalmasso et al observed similar results in a study conducted in Italy[15].

Our study revealed that majority of the patients were from KP followed by Punjab, AJK, Sindh and Baluchistan. This appeared to be a biased distribution, although our centre receives military pediatric oncology cases from all over Pakistan, but civilian referrals are restricted to the northern half.

Most of the results of this study were comparable with the data of studies conducted locally and in other countries.

CONCLUSION

The study conducted clearly demonstrated leukaemia to be the most common childhood malignancy. Males were more commonly affected as compared to females and most of the patients were from NWFP. Our research findings are useful for prioritizing future childhood cancer research needs. However a study design comprising multiple centers, and a higher number of patients over a longer period of time will be more representative, particularly in case of rarer tumors. It will also nullify any regional bias due to fewer centers of treatment.

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