INTERNATIONAL JOURNAL OF MEDICAL AND APPLIED SCIENCES
E-ISSN:2320-3137

Research Article

PAEDIATRIC NON HODGKINS LYMPHOMAS-ACLINICOPATHOLOGICAL STUDY

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Abstract :

NHL is the fifth most common diagnosis of pediatric cancer in children under the age of 15 years, and it accounts for approximately 7 percent of childhood cancers in the developed world . The four major histologic subtypes of NHL in children are precursor B and precursor T lymphoblastic lymphoma, Burkitt's lymphoma, anaplastic large cell lymphoma, and large B-cell lymphoma. In adults, Burkitt's and lymphoblastic lymphoma are rare, but follicular center cell and other low-grade B-cell lymphomas that are infrequently seen in children predominate. Conclusion:Accurate incidence of data is important in the planning and evaluation of clinical trials. Documentation of cases, advanced diagnostic methods like IHC, cytogenetic studies and treatment modalities with close follow up is needed to achieve better statistical evaluation of the problem.
Key words: Non hodgkins lymphoma, paediatric

INTRODUCTION

NHL is the fifth most common diagnosis of pediatric cancer in children under the age of 15 years, and it accounts for approximately 7 percent of childhood cancers in the developed world [1]. Approximately two-thirds of the lymphomas diagnosed in children are non-Hodgkin's lymphoma (NHL), and the remainders are Hodgkin's disease. The spectrum of NHL seen in pediatric patients differs significantly from that seen in adults. The four major histologic subtypes of NHL in children are precursor B and precursor T lymphoblastic lymphoma, Burkitt's lymphoma, anaplastic large cell lymphoma, and large B-cell lymphoma. In adults, Burkitt's and lymphoblastic lymphoma are rare, but follicular center cell and other low-grade B-cell lymphomas that are infrequently seen in children predominate. No sharp age peak (median age, 11 years) occurs in children with NHL and the male to female ratio approaches 3:1. Children with severe combined immunodeficiency syndrome, Wiskott-Aldrich syndrome, common variable immunodeficiency, ataxia-telangiectasia, and the X-linked lymphoproliferative syndrome are at increased risk for developing a lymphoma. Acquired immunodeficiency secondary to human immunodeficiency virus infection or immunosuppressive therapy, especially after solid organ transplantation or BMT, also places individuals at greater risk for developing a lymphoproliferative disorder or malignant lymphoma.[2,3,4] We attempted to study the occurrence of Non Hodgkins lymphoma in paediatric population.

METHODOLOGY

This study was under taken to evaluate the incidence and morphological features of solid malignant tumors in children of fifteen years and below. The material for present study was obtained from SIMS and referred cases. The clinical history regarding duration of the disease, mode of presentation, symptoms and signs were recorded from the case papers, request forms,patient's history, clinical data along with relevant details obtained from available hospital and departmental records. The histopathology slides and paraffin blocks were reviewed.

The gross examination was done carefully noting the size, shape, extent and configuration, nodularity, consistency (solid, cystic or mixed) and torsion. A minimum of 4-5 bits were selected from the representative areas of tumor. The tissue for routine microscopy was preserved and fixed in 10% neutral buffered formalin for 24 hours and processed in automatic tissue processor (Histokinette) and embedded in paraffin. The sections 3-5 μ thick, were cut and stained by haematoxylin and eosin in all cases and special stains like PAS and IHC done where ever feasible.

OBSERVATIONS

Ten cases (15.15% of total malignant tumors) were encountered, out of which 6(60%) were lymphoblastic lymphoma, 3(30%) were Burkitt's lymphoma and 1(10%) DLBCL/Anaplastic lymphoma.The mean age being 10 yrs 4mts.It most commonly presented in 10-15yrs age group (72.72%). Case distribution included 1 in 1-5yr, 2 in 5-10yrs and 8 cases in 10-15 yrs age group. The commonest histological type being lymphoblastic lymphoma (60%). Sex ratio of M:F was 4:1. The sites of involvement were as follows-cervical lymphadenopathy (4), generalised lymphadenopathy (4) and axillary lymphadenopathy (2). The Symptomatology included swelling, pain, fever and weight loss with duration ranging from 1mt- 2yrs.

Lymphoblastic lymphoma- Six cases (60% of NHL) were encountered. Case distribution included 2 in 5-10yrs and 4 cases in 10-15 yrs age group. It most commonly presented in 10-15yrs age group (66.66%). The mean age being 10 yrs 4mts. Sex ratio of M:F was 2:1. The sites of involvement were as follows-cervical lymphadenopathy (2), generalised lymphadenopathy (2) and axillary lymphadenopathy (2).

Burkitt's lymphoma: Three cases (30% of NHL) were encountered. Case distribution included 2 in 5-10yrs and 1 case in 10-15 yrs age group. It most commonly presented in 5-10yrs age group (66.66%).The mean age being 9yr 8mts, exclusively involving males. The sites of involvement were as follows-cervical lymphadenopathy (2) and generalized lymphadenopathy (1).

DLBCL/Anaplastic lymphoma- Eleven yrs old boy presented with generalized lymphadenopathy constituting 10% of non Hodgkin's lymphomas.

Table- 1: Non Hodgkin's lymphoma subtypes with respect to age, site and sex distribution.

Histological subtypes	Mean age	Sites	Male (%)	Female (%)	Total No.(%)
Lymphoblastic lymphoma	10yr 4mts	Cervical-2 Axillary-2 Generalized-2	4(40%)	2	6(60%)
Burkitt's lymphoma	9yr 8mts	Cervical-2 Generalized-1	3(30%)	-	3(30%)
DLBCL/Anaplastic lymphoma	11yrs	Generalized-1	1(10%)	-	1(10%)
Total Non Hodgkin's lymphoma	10yr 4mts	Cervical-4 Axillary-2 Generalized-4	8(80%)	2(20%)	10(100 %)

DISCUSSION

Non-Hodgkin lymphoma (NHL) consists of a diverse group of malignant neoplasms of the lymphoid tissues variously derived from B cell progenitors, T cell progenitors, mature B cells, or mature T cells. Unlike in adults where low-grade, clinically indolent NHL subtypes predominate, most pediatric NHL cases are of high grade and have an aggressive clinical behavior [5]

Non Hodgkin's lymphomasparameters like male dominance, sub typing, age group and general incidence in present study are in conformity with other studies in India and abroad as depicted in the Table No.2.

In the present study lymphoblastic lymphoma was most common type. This correlates with studies made by Mankodi et al[6]andRamkumar et al[7], while few other series showed Burkitt's or DLCL as the commonest subtype(Table No.2). Lymphadenopathy was the commonest presenting symptom, involving cervical followed by generalized and axillary lymphnodes. This observation in conformity with Desai et al [8] Rajkumari et al[9], and Oconar[10] studies.

Table No.2 :Comparison of Non Hodgkin's Lymphoma parameters in various studies.

Non Hodgkin's lymphomas	SEER[11]	Venugopal et al[12]	Present study
M:F	3:1	3.5:1	1.16:1
Mc age group	10-15yrs	1-5yrs	10-15yrs
Mc subtype	Burkitt's lymphoma	--	LL

Paediatric risk groups in ALL/LL are based on cytogenetic profile, age, leucocyte count, sex and response to initial therapy. Adverse factors include very young age <1year, cytogenetic abnormalities like t(9;22)(q34;11.2) and t(4;11)(q21;q23). Good prognostic factors include hyperdiploidy, t(12;21) and low/normal leukocyte count at diagnosis.

Burkitt's lymphoma is the most common lymphoma in African children. Males are affected more than females. In endemic and sporadic BL, the tumor is highly aggressive but potentially curable. The treatment should begin as early as possible, due to the short doubling time of the tumor. Bone marrow and central nervous system involvement, unresected tumor greater than 10cms, a high LDH serum level are recognized as poor prognostic factors. Endemic BL is highly sensitive to polychemotherapy.ALCL is most frequent in the first decade of life and show a male predominance. ALK positivity has been associated with favorable prognosis. [4]

Prognostic factors for childhood NHL includes **age,** In this retrospective review, the outcome for infants was inferior compared with the outcome for older patients with NHL.[13] patients with low-stage disease (i.e., single extra-abdominal/extrathoracic tumor or totally resected intra-abdominal tumor) have an excellent prognosis (a 5-year survival rate of approximately 90%), regardless of histology.[14,15] Patients with NHL arising in bone have an excellent prognosis, regardless of histology.[16] Testicular involvement does not affect prognosis.[17] As opposed to adults, mediastinal involvement in children and adolescents with nonlymphoblastic NHL results in an inferior outcome.[18] The combination of CNS involvement and marrow disease appears to impact outcome the most for Burkitt lymphoma/leukemia.[19] Tumor burden (i.e., elevated levels of lactate dehydrogenase) has been shown to be prognostic in many studies.[20] More recently, detection of minimal disease at diagnosis or minimal residual disease (MRD) appears to be prognostic in most subtypes of childhood NHL. [21]

Conclusion

The frequency of Non Hodgkins lymphoma ors and their distribution is comparable to that reported from other studies. Accurate incidence of data is important in the planning and evaluation of clinical trials. Documentation of cases, advanced diagnostic methods like IHC, cytogenetic studies and treatment modalities with close follow up is needed to achieve better statistical evaluation of the problem.

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