Role of Lymph Node Biopsy in the Diagnosis of Children with Lymphadenopathy (Single Surgeon Experience)

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ABSTRACT:

BACKGROUND:

Assessment of lymphadenopathy in children represents a diagnostic challenge because of the extensive differential diagnoses, including reactive and malignant conditions.

OBJECTIVE:

To determine the role of lymph node biopsy in the diagnosis of lymphadenopathy in paediatrics age group

PATIENTS AND METHODS:

A cross sectional study was carried out on 92 patients (males 56 and 36 females) with lymphadenopathy admitted to paediatric surgery unit at Children Welfare Teaching Hospital – Medical City Complex – Baghdad in the period between January 1st. 2010 to December 31st. 2016; for biopsy to reach final diagnosis.

Patients were referred from general wards, paediatrics outpatient clinic and oncology unit.

Data regarding patient name, age, gender, signs and symptoms, site of lymph nodes, size of lymph node, duration of enlargement, investigation, types of biopsy, and mode of treatment were collected and reviewed form patients files.

All patients underwent excisional biopsy and the diagnosis was confirmed by histology and through various specific investigations.

RESULTS:

Among the total 92 lymph node biopsies, the most common pathology encountered was reactive hyperplasia in 68 child (74 %) followed by malignant lymphoma (Non- Hodgkin and Hodgkin) in 15 children (16.3%), followed by tuberculosis in 3 (3.3%).The rest of the lesions include: 1 case of granulomatous lymphadenitis (1%), 2 of histiocytosis X (2%), 2 (2%) of rhabdomyosarcoma, and 1 of germ cell tumour (1%).

Common site of lymph node enlargement was cervical in (97%) of patients.

CONCLUSION:

Cervical lymphadenopathy is a common condition in the paediatric age group. In spite that most common cause of lymphadenopathy was reactive hyperplasia. Lymph node biopsy remains an important diagnostic tool in persistent lymph node enlargement and if malignancy is suspected.

KEYWORDS: lymphadenopathy, lymph node biopsy.

INTRODUCTION:

The human body has approximately 600 lymph nodes. The submandibular, axillary or inguinal lymph nodes may normally be palpable in healthy people. Nodes are packed with lymphocytes that are organized into cortical nodules and medullary cords by connective tissue, trabecule and lymphatic sinuses'. Lymphadenopathy refers to nodes that are abnormal in size, consistency or number. It is usually caused by multiplication of cells normally residing within the node in response to foreign antigens or by invasion or propagation of either inflammatory or neoplastic cells into the node'.[1]

Lymph nodes are not usually palpable in the newborn period. However, with progressive antigenic exposure, this tissue expands in volume, producing palpable cervical, axillary and inguinal nodes throughout the childhood years. Progressive lymph node atrophy begins during adolescence in turn. Thus, lymph node size depends on the person's age as well location and antecedent immunological events.[2]

Lymph node enlargement is considered abnormal during the childhood period as the diameter exceeds 1cm in the cervical and axillary chains and 1.5 cm in the inguinal chains. Such enlargement is most commonly caused by the

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proliferation of normal lymphoid components in response to benign, self-limited disease processes, including viral infections, but may also occur secondary to the accumulation of inflammatory cells in response to infection of the node itself (lymphadenitis), or infiltration with malignant cells (lymphoma).[2]

In tropical areas, TB is a main benign cause of LAP in adults and children. In patients with TB, the assessment of the human immunodeficiency virus (HIV) is advised because it increases the incidence of extra pulmonary TB to more than 50%. Infectious mononucleosis affects patients of all ages; however, it is more frequent before adolescence. Approximately over 90% of adults all over the world are seropositive for this viral disease, although only 25-30% of them have become clinically ill. [3]

In general practice, less than one percent of patients with LAP have malignant disease, often due to leukemia in younger children and Hodgkin's disease in adolescents. It has been reported that the prevalence of malignancy is 0.4% in patients under 40 years and 4% in those over 40 years of age in the primary care setting. The prevalence rises to 17% in referral centers15and soars to 40-60% in highly suspicious patients. Be that as it may, the location of LAP changes the possibility of malignancy. [3]

Hodgkin's disease is rare before 10 years old and a small male dominance is present, especially in childhood. The Epstein-Barr virus infection in combination with immune deficiency is a risk factor for increasing Hodgkin's disease, particularly in less-developed countries and low socioeconomic conditions. Non-Hodgkin's lymphoma, the fourth common worldwide malignancy in males with a frequency of 6.1%, is another cause.[3]

AIM OF THE STUDY:

To determine the role of lymph node biopsy in the diagnosis of lymphadenopathy in pediatrics age group.

PATIENTS AND METHODS:

A cross sectional study was carried out on 92 patients with lymphadenopathy aged (three months to14 years) admitted to pediatric surgery unit at Children Welfare Teaching Hospital – Medical City Complex – Baghdad in the period between January 1st. 2010 to December 31st.

2016; for biopsy to reach the final diagnosis after a period of no response to courses of oral or intravenous antibiotics.

Patients were referred from general words, and pediatrics outpatient clinic.

Data regarding patient's name, age, gender, signs and symptoms, site of lymph nodes, size of lymph node, duration of enlargement, investigation , types of biopsy, and mode of treatment before biopsy all were collected and reviewed from patients hospital files. Written informed consent was taken from all patients relatives.

All patients underwent excisional biopsy by single surgeon and lymph node immediately fixed in formalin. The diagnosis was confirmed on histology and through various specific investigations.

Statistical analysis:

Patient data were tabulated and processed using SPSS (Statistical package for the social sciences) V.20 for mac. Qualitative data are expressed as frequency and percentage. Chi-square test was used to identify the association between frequent variables. P- Value equal or less than 0.05; were considered significant.[4]

RESULTS:

In the current study and among the total 92 patients, the largest number of them (75%) were > 5 years of age at presentation. The males were predominant in 61% of patients, with male to female ratio of 1.5:1, as in table 1.

The most common encountered pathology was reactive hyperplasia in 68 child (74 %) followed by malignant lymphoma (Non- Hodgkin and Hodgkin) in 15 children (16.3%), tuberculosis in 3 (3.2%),and the rest of the lesions include; 2 of histiocytosis X (2%), 2 (2%) of rhabdomyosarcoma (RMS),1 patient with chronic granulomatous lymphadenitis (GCL)(1%), and 1 of germ cell tumor (GCT) (1%), as in table 2.

The common lymph node group affected was the cervical in (97%) of patients, followed by axillary (2%), as in table 3.

Pathological lymphadenopathy was more common in male than in female; being the malignant lymphadenopathy among the most common pathology, as shown in table 4.

In correlation between age and type of lymphadenopathy, we found that both pathological and non-pathological lymphadenopathy were more common in those older than 5 years of age, as shown in table 5.

There was no statistical significance between gender, age and the pathology of lymphadenopathy with P-value of 0.1 as shown in table 4, & 5 respectively.

Table 1: Age and gender distribution.

Age	Male	Female	Total
< 1 year	5	0	5 (5%)
1- 5 years	18	13	31 (34%)
>5years	33	23	56 (61%)
Total	56 (61%)	36 (39%)	92 (100%)

Male: female ration= 1.5:1
Age range from 3months- 14 years

Table 2: Causes of lymphadenopathy.

Item	No.	%
Reactive lymphadenitis	68	74
Malignant lymphoma HL NHL	15 9 6	16.3
TB adenitis	3	3.2
RMS	2	2
Histiocytosis -X	2	2
GCT	1	1
CGL	1	1
Total	92	100

Table 3: Site distribution of lymphadenopathy.

Item	No.	%
Cervical	89	97
Axillary	2	2
Inguinal	1	1
Total	92	100

Table 4: Correlation between gender and (pathological &non –pathological) lymphadenopathy in 92 patients.

Pathological (24/92)					p-value
Item	male	female	No.	%	
HL	7	2	9	37.5	
NHL	4	2	6	25	
TB	1	2	3	12.5	
RMS	2	0	2	8.3	
Histiocytosis	2	0	2	8.3	0.1
GCT	1	0	1	4.2	
CGD	1	0	1	4.2	
Total	18	6	24	26	
Non –pathological (reactive) 68/92					
	38	30	68	74	

Table 5: Correlation between age and (pathological & non – pathological) lymphadenopathy in 92 patients.

<1 year	1-5 years	>5year	No.	%	P – value
Pathological					
1	5	18	24	26.1	
Non – pathological					0.1
4	25	39	68	73.9	
5	30	57	92	100	

DISCUSSION:

In the current study male gender were predominate in (61%) of patients with male: female ratio of 1.5:1.This is similar to Ghazala Hanif et al in Saudi Arabia 2009 [5], and similar to M. Pradeep Reddy et al in India 2002 [6] in which male gender accounts 54.6% & 79% of patients respectively. But it differs from that in of Dr.Radha.M et al in which female gender was predominant in 0.8:1.[7]

In the current study the largest number of patients at diagnosis

were > 5 years of age in (61.9%) of patients, this is similar to Ghazala Hanif et al in Saudi Arabia 2009[5] and similar to M. Pradeep Reddy et al in India 2002[6], in which 62.9% & 55% respectively were > 5 years of age at time of diagnosis.

This might be explained that lymph nodes in children reach their largest size about the age of 8-12 years and get smaller after adolescence.[8]

In this study, cervical lymph nodes were most commonly affected in (97%) of patients, followed by axillary lymph node group in (2%), and inguinal (1%) these findings are similar to Dr.Radha M.et al [7] in which 77% of patients were presented with cervical lymphadenopathy, but it is higher than Ghazala Hanif et al in Saudi Arabia 2009[5], Adesuwa Olu-Eddo N et al in Nigeria and Anunobi CC in Lagos 2008 (9), on which cervical lymph node group seen in 52% & 39.3% respectively. and this can be explained that the cervical lymph nodes are the first drainage station for key points of contact with the outside world (mouth/throat/nose/eyes/ears/respiratory system) – a critical aspect especially among children.[11]

In this series the follicular reactive nodular hyperplasia was the most common etiology which is seen in (74%) of patients, followed by lymphoma in (16.3%) for both NHL & HL, and TB adenitis in (3.2%) of patients, while in Ghazala Hanif study in Saudi Arabia 2009 [5], the most common etiology of lymphadenopathy was follicular hyperplasia in (39.6%) of patients, followed by TB adenitis in (29%) of cases, and lymphoma in (14.6%) of patients. In M. Pradeep Reddy study in India 2002[6], TB lymphadenitis was the most common cause in (35%) of patients followed by chronic tonsillopharyngitis in (15%), and lymphoma in (3%) of patients.

In Anunobi CC study in Lagos 2008 [9], Malignancy (47.8%) was the most common cause of superficial lymphadenopathy, followed by chronic non specific lymphadenitis was found in (34%), tuberculosis in (17.4%).

In Adesuwa Olu-Eddo N in Nigeria 2006 [9], Tuberculosis was the predominant cause of peripheral lymphadenopathy in (48.4%) of patients. In Dr.Radha. M et al 2016, reactive lymphadenitis was the commonest (47.3%) followed by granulomatous lymphadenitis (23.1%), tubercular lymphadenitis (20%), suppurative (4.2%) and necrotizing lymphadenitis (1.05%).[7] In Arun Roy[12] in 2003, neoplastic lesions were more common comprising 53%. These variations reflect different in biology of the diseases between countries.

The most important thing in patients complaining from lymphadenopathy is the detection of the underlying neoplastic process, with the most frequent being Hodgkin lymphoma.

CONCLUSION & RECOMMENDATION:

Cervical lymphadenopathy is a common condition in the pediatric age group. In spite that most common cause of lymphadenopathy was reactive hyperplasia. Lymph node biopsy remains an important diagnostic tool in persistent lymph node enlargement and if malignancy is suspected.

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