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Study of the role of fine needle aspiration cytology and clinicopathological analysis of significant cervical lymphadenopathy in children in a tertiary Hospital

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Abstract:
Background*: Lymph nodes along with spleen and mucosa associated lymphoid tissue are secondary peripheral lymphoid organs, while thymus and bone marrow are the primary lymphoid organs. Due to their easy accessibility they are frequently examined for diagnosing lymphoreticular disorders.*
Materials and Methods*: This study was carried out in cytology section of the department of Pathology , in collaboration with Department of Paediatrics, Regional Institute of Medical Sciences Hospital during the period from February 2017 to February 2020 .*
Results*: Cervical lymphadenopathy is a fairly common clinical presentation in children. Non specific reactive lymphadenitis was the commonnest cytological diagnosis in this present study of significant cervical lymphedenopathy (60%), fallowed by suppurative lymphedenitis (15%) and tubercular lymphedenitis (13%).*
Conclusion*: Significant cervical lymphedenopathy is commonly encountered in children and is often diagnostic challenge to the clinicians and pathologist alike. Fine needle aspiration cytology is a simple, rapid and inexpensive procedure.*
Key words*: Cervical, aspiration, cytology and children*

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I. Introduction

Lymph nodes are most widely distributed collection of lymphoid tissue within the lymphoreticular system. Lymphocytes that populate lymph nodes and the other lymphoid organs arise from progenitor lymphoid stem cell in bone marrow where they proliferate and differentiate independent of antigen into precursor T and B lymphocytes. Lymphadenopathy is the term used to describe lymph nodes affected by any disease process,including inflammatory, reactive and neoplastic conditions. The majority ot the conditions involving lymph nodes result in their enlargement so the term lymphadenopathy is commonly used in relation to an enlarged lymph node or nodes. However there are other forms of lymphadenopathies in which the lymph nodes are of normal size or smaller ; as in case of micrometastasis in lymph nodes where it may not be enlarged or immunodificiency diseases due to poor development or involution of lymph nodes[1].

Cervical lymph node enlargement is common clinical finding in paediatric practice. Any failure to decrease in size of lymph node within 10-14 days of treatment should be investigated[2]. In the united state of America, paediatric includes individuals upto age of 21 years, UNICEF is contended with upto 18 years as paediatric age[3].

Today fine needle aspiration cytology is a part of initial management of patients presenting with neck masses. The main benefits is to avoid surgical biopsy, which requires local or general anaesthesia and does not leave a scar[4]. Cytological examination of FNA smears can determine lymphadenopathy due to reactive hyperplasia,infection,metastatic malignancy or malignant lymphoma[5].

Diagnostic cytopathology is the culmination of several centuries of observation and research. Fine needle aspiration cytology can be perform as an outpatient procedure when the patient is clinically examined for the first time and report can be obtained within hours[6]. The diagnostic accuracy of the method varies from 90 to 97% depending on anatomic site of aspiration[7].

II. Aims And Objects

1. To evaluate the role of fine needle aspiration cytology in categorizing different types of cervical lymphadenopathy in children.

2. To study the correlation between clinicopathological findings and the FNAC findings.
3. To evaluate different causes of cervical lymphadenopathy.

III. Materials and Methods

The study was carried out in cytology section of the department of pathology,in collaboration with department of paediatrics, Regional Institute of Medical Science,Imphal during the period from February 2017 to February 2020 .The subjects underwent FNAC of cervical lymph node with the help of 22-23 gauge disposable needle and Comeco syringe pistol with a negative suction from 20 ml syringe. Smears were made from the aspirate and air dried and then stained with Giemsa stain . Acid fast bacilli (AFB) and other stains were done whenever required. The detailed history of patient with respect to age , sex, site and duration of involvement and other relevant investigations like routine blood counts,ESR,Mantoux test were performed whenever necessary and recorded in the specially designed proforma.

IV. Results and Analysis

A total of 120 patients upto 12 years of age presenting with cervical lymphadenopathy attending cytology section from both paediatric OPD and ward were included randomly in the study.

Table No.1 Diagnosis by fine needle aspiration cytology (FNAC)

FNAC Diagnosis	Number of Cases	Percentage
Non specific reactive lymphadenitis	80	66%
Granulomatous lymphadenitis	4	3.3%
Tuberculous lymphadenitis	16	13.3%
Suppurative lymphadenitis	18	15%
Leukemic cell infiltration	2	1.7%
Total (n)	120	100%

Non specific reactive cervical lymphadenitis was the most common cytological diagnosis (66%) followed by suppurative lymphadenitis (15%) and tubercular lymphadenitis(13.3%)

Table No.2 The frequency distribution of cytological findings by sex

Diagnosis	Male	Female
Non specific reactive lymphadenitis	50(62.5%)	30(37%)
Granulomatous lymphadenitis	4(100%)	
Tuberculous lymphadenitis	6(37.5%)	10(62.5%)
Suppurative lymphadenitis	14(77.8%)	4(22.2%)
Leukemic cell infiltration	2(100%)	
Total (n=120)	76(63.3%)	44(36.7%)

In both sexes non specific cervical reactive lymphadenitis was the most common cytological diagnosis comprising 62.5% in males and 37.5% in females respectively.

Table no.3 Frequecy of various lymph node levels among the patients

Cervical lymph node level	Frequency	Percentage
Level 1	58	48.3%
Level 2	44	36.7%
Level 3	6	5.0%
Level 4	2	1.7%
Level 5	10	8.3%
Total	120	100%

Amongst the various levels of cervical lymph node, level 1 was the commonnest involved with lymphadenopathy (48.3%), fallowed by level (37.5%) and level (8.3%).

Table no. 4 Distribution of cases according to differential leucocyte count

Diagnosis	No.of cases	Lymphocytes	Normal count	PNL	Blast
NSRL	80	-	12(15%)	68(85%)	-
Suppurative LN	18	-	18(100%)		-
Granulomatous LN	4	-	4(100%)		-
Tuberculosis LN	16	16(100%)	-	-	-
Leukemic cell infiltration	2	-	-	-	2(100%)

PNL:Polymorphonuclear leucocytosis

Out of total 80 cases with nonspecific reactive lymphadenitis, 68 cases has polymorphonuclear leucocytosis, 12 cases had normal counts. All 18 suppurative lymphadenitis and 4 granulomatous lymphadenitis showed normal count. All patients with tubercular lymphadenitis had lymphocytosis.

V. Discussion

Cervical lymphadenopathy is a fairly common clinical presentation in children . FNAC has become first line investigative technique in lymph node swellings and biopsy is considered only when definitive diagnosis could not be made.

Nonspecific reactive lymphadenitis was the commonnest cytological diagnosis in this present study of significant cervical lymphadenopathy comprising of 66% cases followed by suppurative lymphadenitis 15% and tubucular lymphadenitis in 13.3%. These findings are similar to study done by Rimawi H et al[8]. In this study, granulomatous cervical lymphadenitis comprises only 3.3% but Haque MA et al[9] found it to be the commonnest diagnosis.There was only one case of leukamic cell infiltration of cervical lymph node which could be due to short duration of study. Khajuria R et al[10] in his study found in the first two decades of life reactive hyperplasia is the commonnest lymphadenitis, tubercular lymphadenitis in second and third decade and metastatic in over 40 years of age.

In this study age of patients ranges from 10 months to 12 years and maximum patients were in the age group of 5 to 8 years comprising 45% fallowed by 9 to 12 year age group with 35%. Gupta AK et al[9] noted 6 to 10 years age group as the commonnest with cervical lymphadenopathy. The sex ratio in the present study was 1.72:1 with a total of 63.3% males against 36.7% females and similarly both Annam V et al[11] and Shakya G et al[12] observed male preponderance. Nonspecific reactive cervical lymphadenitis was the commonnest cytological diagnosis in both sexes with male comprising 62.5% and females with 37.5% which could be due to frequent infections in children with pyogenic and viral organisms in the developing countries.

In the study, Hindu comprises highest percentage with 60% followed by Christians 31.7% and Muslims 8.3% which could be attributed to the fact that the hindus constitute majority of the population in Manipur and as such religion is not found to influence the disease.

Amongst the various cervical lymph node, Level 1 lymph node was commonnest enlarged (48.3%) followed by level 2 (36.7%) and level 5 (8.3%). Khan et al[13] also noted level 1 cervical nodes as the commonly invoved cervical lymph node (67%). 85% of nonspecific reactive cervical lymphadenitis showed polymorphonuclear leucocytosis and all the tubercular lymphadenitis had lymphocytosis. Gupta AK et al[2] also observed polymornuclear leucocytosis in 100% diagnosed cases of non specific reactive lymphadenitis and lymphocytosis in 100% cases of tubercular cervical lymphadenitis.

VI. Conclusion

Significant cervical lymphadenopathy is commonly encountered in children and is often a diagnostic challege to the clinicians and the pathologist alike. Fine needle aspiration cytology is a simple rapid and inexpensive procedure which helps in the diagnosis and also providing guidelines for further investigations required in better management of the patient. Non specific reactive cervical lymphadenitis was the commonnest cytological diagnosis followed by suppurative cervical lymphadenitis. Polymorphonuclear leucocytosis and lymphocytosis were commonly noted in non specific reactive cervical lymphadenitis and tubercular cervical lymphadenitis respectively.

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