Fine Needle Aspiration Cytology In Evaluation Of Cervical Lymphadenopathy In Paediatric Age Group

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Abstract: Background: Lymphadenopathy is common problem in children. The aim of present study is to evaluate the role of FNAC as a diagnostic procedure in paediatric patients with cervical lymphadenopathy. Material & Methods: The present study was carried out on total 148 children up to 12 years of age; who presented with palpable cervical lymphadenopathy at V.S. General Hospital during the period from July 2014 to October 2016. FNAC was done by standard procedure and slides were wet fixed and stained with H & E stain. ZN stain was performed whenever required. Result: Most of patients were in age group of 10 to 12 years (65.54%). The male to female ratio was 1:1.17. The frequency of inflammatory and neoplastic lesions was 96.62% and 3.38% respectively. Among the inflammatory lesions, granulomatous/ tuberculous lymphadenitis [68 cases (45.94%)] was the predominant lesion, followed by reactive lymphadenitis [64 cases (43.24%)] and acute suppurative lymphadenitis [11 cases (7.43%)]. Among the neoplastic lesions, 4 cases were of Hodgkin's lymphoma and one case was of Non- Hodgkin's lymphoma. Female preponderance was noted for granulomatous lymphadenitis while male preponderance was observed for reactive lymphadenitis and lymphoma. Conclusion: FNAC is found to be safe, simple, reliable and cost effective method for rapid diagnosis of cervical lymphadenopathy in paediatric patients. [Parikh S Natl J Integr Res Med, 2020; 11(3):23-27]

Key Words: FNAC, Cervical lymphadenopathy, Paediatric, Tuberculous

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Introduction: Fine needle aspiration cytology (FNAC) has become important first line investigation in palpable masses in head and neck area. FNAC is a simple, quick and cost effective method to sample superficial masses found in head and neck region in outpatient settings [1,2].

Cervical lymphadenopathy often poses a diagnostic dilemma for the treating paediatrician and is often a cause of concern for the parents. Cervical lymphadenopathy is a commonly encountered clinical problem in paediatric patients which has a multitude of causes.

Etiological profiles vary from country to country and in our nation, still tuberculosis continues to be the commonest cause of enlarged cervical lymph nodes in children despite of its preventive programs at the national level. The tuberculous involvement of lymph nodes is the most common form of extra pulmonary tuberculosis (responsible for 30-40% of cases)[3]. Although surgical excision of a palpable peripheral node is relatively simple, Fine needle aspiration cytology offers the alternative preliminary, although not always specific diagnosis and thus, providing ample information for the further management[4]. Nowadays, FNAC is increasingly being applied to paediatric lesions as it permits rapid diagnosis with minimal intervention.

The study was carried out with following aims and objectives:

1. To evaluate and document the role of FNAC as a diagnostic procedure in a patients with cervical lymphadenopathy in paediatric age group.
2. To study the cytological spectrum of cervical lymphadenopathy in children with its correlation with clinical and demographic details.

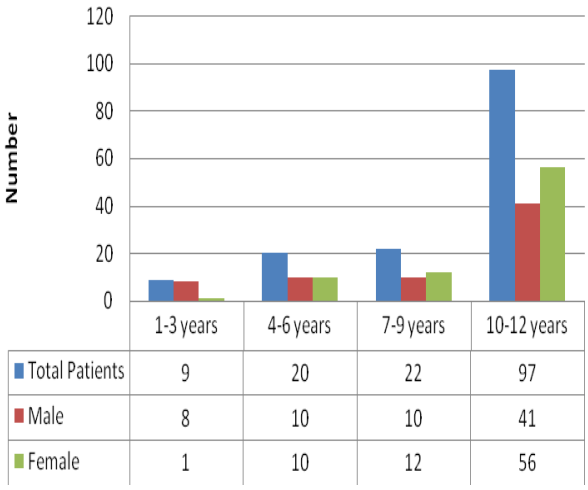
Material & Methods: A study was carried out on total 148 children presented with palpable cervical lymph node. The study was performed during the period from July 2014 to October 2016 at Pathology Department, V.S. General Hospital**,** Ahmedabad. Cases up to the age of 12 years were included. Patients with non-palpable deep seated lesions, uncooperative children, and the cases without consent were excluded. Unsatisfactory smears were also not taken into account. Detailed clinical history including laboratory data were obtained from case sheets. Thorough general physical examination was carried out. Palpable cervical lymph nodes were examined noting their size, consistency, number, mobility, presence of matting and any local changes like redness, discharge or sinus formation. Fine needle aspiration was carried out by cytopathologist using 22 gauge needles and 10

cc plastic syringes[4]. Local anesthetic was not used and proper aseptic and antiseptic precautions were observed. Direct percutaneous aspiration was employed without any radiological guidance. Multiple sites were aspirated as per standard guidelines. The specimen was smeared by Direct Smearing method. Smears were wet fixed with 95% ethanol and stained with Hematoxylin and Eosin (H & E) stain. Ziehl-Neelson (ZN) stain for Acid fast bacilli was carried out whenever indicated. It was done on air-dried films. All the stained smears were evaluated by cytopathologists. Diagnosis was rendered based on cytomorphological features and clinical correlation.

Five cases for which preoperative cytological findings and subsequent histological diagnosis were available during this period were included in the study and cyto-histological correlation was done. Data were analyzed.

Results: A present study included 148 cases of palpable cervical lymph node swelling in paediatric age group in which FNAC was performed. Technical complications were not found. The distribution of cases in relation with age and sex are as follows (Figure-1).

Figure 1: Age And Gender Distribution



The age of the patients presented with cervical lymphadenopathy ranged from 2 to 12 yrs. The maximum numbers of cases were seen in patients with age group of 10-12 yrs (65.54%).

Among 148 children, 51 cases were below 10 yrs of age. The least number of cases were seen in children below 3 years. Amongst 148 children, 69 (46%) were males and 79 (54%) were females with male to female ratio being 1:1.17; having the female predominance.

Table 1: FNAC Diagnoses In Patients With Cervical Lymphadenopathy

FNAC Diagnoses		No. of Cases	Percentage (%)	Total (%)
Inflamm-atory	Granulomatous / Tuberculous lymphadenitis	68	45.94%	96.62 %
	Reactive lymphadenitis	64	43.24%	
	Acute suppurative inflammation	11	7.43%	
Neo plastic	Hodgkin's lymphoma	4	2.70%	3.38 %
	Non-Hodgkin's lymphoma	1	0.67%	

Cytomorphological diagnosis of all lesions is depicted in Table -1. Out of 148 cases, 143 cases were found to be inflammatory lesions and rests were malignant. Amongst the inflammatory lesions, granulomatous lymphadenitis consistent with tuberculosis was the predominant one followed by non specific reactive lymphadenitis.

Because of high prevalence of tuberculosis in our set up, all granulomatous lesions with or without caseous necrosis and irrespective of AFB stain results, were accounted to be consistent with tuberculosis until and unless proved otherwise.

Some lesions with suppurative inflammation without clear granuloma formation were labeled as tuberculous abscess, if results of ZN stain yielded positivity for acid fast bacilli.

Amongst the malignant lesions, all 5 cases were diagnosed as malignant lymphoma with 4 cases fell in the category of Hodgkin's lymphoma; while 1 case was of Non- Hodgkin's lymphoma. Of all 5 cases diagnosed as lymphoma; all were confirmed subsequently on excision biopsy specimens. Not a single case of metastatic lesion was found in the present study.

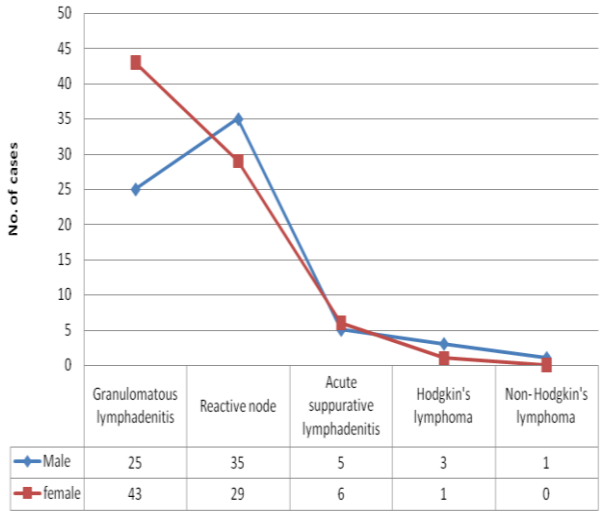
Chief clinical features are highlighted in Table-2. Majority cases of granulomatous lymphadenitis had fever, cough, loss of weight and appetite. Neck swelling with pain, fever and ear discharge was commonly noted with acute suppurative lymphadenitis (abscess) while painless

lymphadenopathy was associated with cases of lymphoma.

Table 2: Chief Symptoms Of Patients.

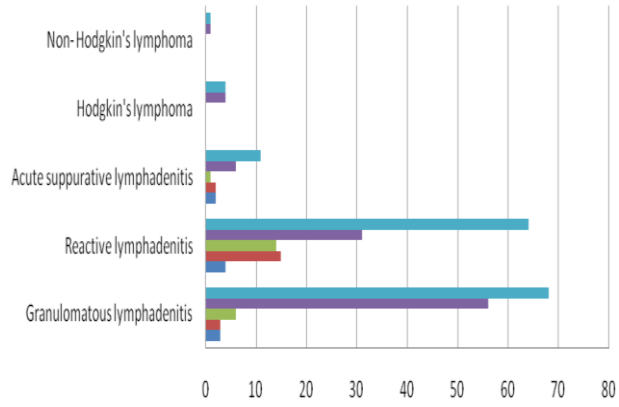
Clinical Features	No. of Patients	Percentage (%)
Neck swelling	148	100
Fever	70	47.30
Cough	75	50.68
Weight loss	44	29.73
Loss of appetite	50	33.78
Ear discharge	3	2.03

Figure-2: Correlation Of Cytology Diagnosis With Gender



Granulomatous lymphadenitis showed female preponderance while reactive lymphadenitis and Hodgkin's lymphoma showed male preponderance (Figure-2).

Figure 3: Correlation Of Cytology Diagnosis With Age Group



As depicted in figure-3, all lesions showed increased frequencies in the age group of 10-12 years with all lymphoma cases being exclusively fell in this age group. In children up to 9 years, reactive lymphadenitis was more common as compared to other lesions.

Discussion: FNAC has become an accepted method for the work-up of cervical lymphadenopathy because of a wide spectrum of lesions encountered at this location. In this study, maximum number of patients were observed in the age group of 10-12 years (65.54%) followed by 7-9 years age group (14.86%). Wakely PE Jr, Kardos TF and Frable WJ[5], reviewed FNACs in <16 years age group and found that majority cases were seen in age group of 6-11 years (34.82%) followed by 12-16 years age group (32.14%).

Neha singh et al[6] showed the maximum frequency of patients in the age group of 5-10 years (48.59%) followed by 10-16 years age group (35.34%). Bhatia Gunjan and Bhatia Ravi[7] reported highest frequency of patients in 6-10 years age group in their study of FNAC findings of cervical lyphadenopathy in children aged 1-10 years. In all studies including ours the number patients below 5 years were uniformly less.

In the present study, female preponderance was noted with male to female ratio being 1:1.17. A study done by Ahmad T et al[1] showed the similar result with male to female ratio of ratio 0.47:1.

Rizwan A.Khan et al[8] also noted female predominance with M: F ratio being 1:1.22. The study done by Neha singh et al[6] revealed male preponderance with male to female ratio 2.34:1. Different gender distribution in various studies might be due to impacts of social and geographical variations.

Table-3 depicts the comparison of cytology diagnosis between various studies in patients with lymphadenopathy. In our study, granulomatous/ tuberculous lymphadenitis was the predominant lesion, followed by reactive lymphadenitis. Minal Panchal et al[9] observed the similar pattern of occurrence in their study.

In the studies of Rizwan A.Khan et al[8], Bhatia Gunjan & Bhatia Ravi[7] and Neha et al[6]; the reactive lymphadenitis was the predominant lesion followed by granulomatous/tuberculous lympha- denitis. Tuberculosis is the commonest cause of lymphadenopathy in developing countries like India and should be considered in every case of granulomatous lymphadenopathy

unless proved otherwise, whereas evaluation of granulomas is a complex problem in developed countries[10].

Table 3: Comparative Analysis of Cytology Diagnoses of Lymphadenopathies in Different Studies

Cytological Diagnosis	Neha Singh et al[6]	Bhatia Gunjan, Bhatia Ravi[7]	Rizwan A.Khan et al[8]	Minal Panchal et al[9]	Present Study
	No. of Cases (%)	No. of Cases (%)	No. of Cases (%)	No. of Cases (%)	No. of Cases (%)
Reactive Lymphadenitis	324(69.83%)	55 (51.89%)	49(55.05%)	112 (43.08%)	64(43.24%)
Acute Suppurative Lymphadenitis	16 (3.45%)	08 (7.55%)	-	10(3.85%)	11(7.43%)
Granulommatous lymphadenitis/Tuber-culous Lymphadenitis	116 (25%)	41(38.68%)	35(39.32%)	122(46.93%)	68(45.94%)
Hodgkin's Lymphoma	5(1.08%)	1(0.94%)	3(3.37%)	2(0.76%)	4(2.70%)
Non- Hodgkin's Lymphoma	2(0.43%)	-	2(2.24%)	12(4.62%)	1(0.67%)
Metastatic Carcinoma/ Other lesions	1(0.21%)	1(0.94%)	-	1(0.38%)	-
Total	464	106	89	260	148

In our set up, tuberculosis is highly prevalent lesion; as our hospital patients mainly belong to the lower socio-economic group. In many patients family history of tuberculosis was found. Because of this scenario, we label all granulomatous lesions to be consistent with tuberculosis despite of negative ZN stain results. Empirical treatment has been given in those patients even though, no confirmatory evidence is found for acid fast bacilli. Follow up studies reveal curative response in most patients.

In the present study, lymphoma was the main lesion found in neoplastic category. This coincides with all above mentioned studies[6-9]. In all studies, except the study of Minal Panchal et al[9] Hodgkin's lymphoma was the predominant lesion. Metastatic lesions were rare in paediatric patients in most series.

In our study, besides neck swelling, fever and cough were the most frequent clinical presentations followed by loss of weight and appetite. The similar symptoms of patients were noted in different studies[7,11,12].

In the present study, granulomatous lesions showed the female predominance while reactive lymphadenitis and lymphoma revealed male predominance. Similar pattern of gender correlation was noted in the study of Hussain Gadelkarim Ahmed et al[13]. In our study, all the lesions were noted with highest frequency in the age group of 10-12 years as the total number of

patients was also highest in this age group. Reactive lymphadenitis was more common in younger children up to 10 years when we compare it with other lesions in the same age group. Similarly, in children above 10 years, granulomatous lesions and lymphoma were more common. Hussain Gadelkarim Ahmed et al[13] noted frequency of reactive lymphadenitis to be reversely increased with age, and granulomatous lymphadenitis and lymphomas to be directly increased with age. They also noted most cases of lymphomas (50%) in the age group beyond 10 years.

Conclusion: Cervical lymph node enlargement is a common clinical problem in the paediatric population with granulomatous and reactive lymphadenitis being two important causes. With increasing cost of medical facilities, any technique which speeds up the process of diagnosis, limits the physical and psychological trauma to the patient and saves the expenditure of hospitalization will be of tremendous value.

FNAC fulfills all these criteria and proves to be very useful primary tool for the diagnosis of cervical lymphadenopahy in children.

It is very well tolerated by children without any complications. FNAC helps the treating clinician in selecting the patient for palliative or surgical management. It reduces the necessities to perform excision biopsy in many cases. Thus, FNAC can be recommended as a first line of investigation in the diagnosis of cervical lymphadenopathy in paediatric age group.

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