EVALUATION OF CLINICALLY PALPABLE CERVICAL LYMPH NODES BY FINE NEEDLE ASPIRATION CYTOLOGY, A PRIVATE PULMO-CLINIC EXPERIENCE

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ABSTRACT

Background and Objective: Cervical lymphadenopathy is a common clinical problem. It is caused by invasion in to or propagation in the nodes of either inflammatory or neoplastic cells. The intent of this study was evaluation of clinically palpable cervical lymphadenopathy by FNAC and also to evaluate the usefulness of FNAC as a diagnostic tool in cases of cervical lymphadenopathy.

Methodology: This descriptive study included 69 patients presenting with cervical lymphadenopathy. There was no age or gender limitations to participate. FNAC was done on all patients. The study was conducted in a private pulmo-clinic in Peshawar from March 2013 to march 2015.

Results: There were 27 (39.1 %) males and 42 (60.9 %) females. Mean age was 26.62 years ± 10.98 SD. Tuberculosis was the commonest diagnosis accounting for 49 (70 %), other diseases diagnosed were reactive hyperplasia 8 (11.6 %), suppurative lymphadenitis 5 (7.2 %), lymphoproliperative disorder 4 (5.8 %), lipoma 2 (2.9 %) and epidermal inclusion cyst 1 patient (1.4 %).

Conclusions: Cervical TB lymphadenopathy is common disease in our society affecting younger population and FNAC is a useful and reliable initial diagnostic tool in the evaluation of lymph nodes.

Key words: FNAC; Lymphadenopathy; Tuberculosis

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INTRODUCTION

Lymph nodes are discrete ovoid lymphoid structures that are widely distributed throughout the body. Lymphadenopathy is defined as abnormal size or structure of lymph node caused by the invasion or propagation of either inflammatory cells or neoplastic cells into the nodes. It is a common clinical problem of many patients presentng to outdoor department. It is mostly caused by benign disorders and can be a transient responses to the local or general infections but sometimes it is due to malignant disorders. [1]

Clinically, lymphadenopathy may be peripheral or visceral. Peripheral lymphadenopathies are easily detected by routine physical examination. Peripheral lymph nodes are easily accessible and are often sampled for histopathology via excision or fine needle aspiration to determine the cause of nodal enlargement. Visceral lymphadenopathy on the other hand, requires laparotomy or sophisticated imaging techniques for detection and evaluation. Among the peripheral nodes, those in the upper part of the body (cervical, supraclavicular, axillary) are preferentially biopsied than lower limb nodes (popliteal, inguinal or femoral) as the former are more likely to yield definitive diagnosis whereas the latter are often characterized by non-specific reactive or chronic inflammatory and fibrotic changes. [2]

Various studies have reported tuberculosis and infectious etiology as major causes of lymph node enlargement in the developing countries, whereas malignancies as a predominant cause in the developed world. [3, 4] Causes of lymph node enlargement vary with age, location of lymphadenopathy, duration of disease, being local or generalized, and associated symptoms and signs like fever, itching and splenomegaly. Metastatic deposit is common in older age group whereas it is rare in children. [5, 6] Reactive

hyperplasia to minor stimuli has been reported as a significant cause of lymphadenopathy in children.[7]

Among different diagnostic techniques Fine needle aspiration cytology (FNAC) is a simple and rapid diagnostic technique. Because of early availability of results, simplicity, minimal trauma and absence of complications, the aspiration cytology is now considered a valuable diagnostic tool. The cytomorphological features correlate well with histopathology and has the qualities of a microbiopsy.[8,9] The intent of this descriptive study was to evaluate clinically palpable cervical lymphadenopathy by FNAC and also to evaluate the usefulness of FNAC as a diagnostic tool in cases of lymphadenopathy.

METHODOLOGY

The present study included 69 patients of lymphadenopathy and was conducted in a private pulmo-clinic in Peshawar from march 2013 to march 2015. Data was collected by non-probability convenience sampling technique. Informed written consent was taken from all the patients for this particular study.

All patients were interviewed to obtain clinical data like age, sex, occupation, clinical symptoms, drugs history and duration of symptoms. Those patients who were known cases of cancers were excluded from the study. Patients were thouroughly examined to know for the site, size, number, consistency, tenderness, mobility of enlarged lymph nodes and also for the presence of associated signs like hepatosplenomegaly. FNAC was performed using a 23-gauge needle. An average 2 passes was performed and minimum 5 slides were prepared. Two slides were air dried and stained by Giemsa stain, and 2 slides were fixed in alcohol and then stained with H and E stain. One slide was kept unstained in each case and Ziehl-Neelsen staining was performed where a cytologic diagnosis of granulomatous disease was made. The aspiration smears from the enlarged lymph nodes were studied to arrive at a probable diagnosis. The cytological results were compared with histological findings, whenever possible. Data were analyzed by using SPSS version 15.0. Frequencies / Percentages were calculated for qualitative variables, while Mean$\pm$ standard deviation was calculated for quantitative variables.

RESULTS

During the study period, a total 69 fine needle aspirations for cytology from lymph nodes were performed. 27 (39.1%) were male and 42 (60.9%) were female patients with male to female ratio of 1:1.5. Age of the patients ranged from 4 to 54 years with mean age of 26.62 years and SD of $\pm$ 10.98. Age of female patients ranged from 9-52 years with mean of 27.21. Age range of males was 4 to 54 years with mean of 25.70 years (Table 1). Most patients 44% (31 cases) were in age range of 21 to 30 years followed by 21.7% patients with age group of 11-20 years. Only 5 patients were 10 or less than 10 years of age.

Most patients belonged to Khyber agency 18.8% followed by district Peshawar 15.9%. 7 patients came from Afghanistan (Table 2).

In almost all patients the site of lymphadenopathy was neck. 37 patients (53.6%) had bilateral cervical lymph nodes enlargement. 18 patients (26%) had only right cervical and 11 had only left (15.9%) cervical lymphadenopathy while 3 patients (4.3) had submandibular region lymph nodes.

Mean duration of presentation with lymphadenopathy was 3.8 months $\pm$ 3.833 SD with minimum duration of 2 weeks and maximum duration of 4.5 years. Mean duration in males was 4.14 months $\pm$ 3.736 SD and 3.59 months $\pm$ 3.924 SD in females.

Most patients 76.8% (53 patients) had multiple lymph nodes vs 23.2% (16 patients)with single lymph node. In most patients lymph nodes were discrete 94.2% while they were matted in only 4 patients. Lymph nodes size was 2 cm or less in 51 patients (73.91%), while 18 patients (26.09%) had nodes size more than 2 cm.

Table 1: Gender and age wise Distribution of Patients (N=69)

Sex	N	% of Total N	Minimum age in years	Maximum age in years	Mean age in years	St d. Deviation
Male	27	39.1%	4	54	25.70	11.172
Female	42	60.9%	9	52	27.21	10.955

Table 2: District-wise Distribution of Patients (N=69)

District	Frequency	Percent
Khyber Agency	13	18.8
Peshawar	11	15.9
Afghanistan	7	10.1
Kohat	6	8. 7
Hangu	4	5.8
Swat	4	5.8
Charsadda	3	4.3
Karak	3	4.3
Mardan	3	4.3
Bajaur Agency	2	2.9
Bannu	2	2.9
Nowshehra	2	2.9
Parachinar	2	2.9
Waziristan	2	2.9
Dir	1	1.4
Malakand Agency	1	1.4
Muhmand Agency	1	1.4
Swabi	1	1.4
Tank	1	1.4
Total	69	100.0

Regarding consistency of lymph nodes most patients (81.2%) had firm nodes, 11.6% had soft nodes and in 7.2% the consistency was hard. Majority 78.3% had mobile nodes and in only 21.7% patients nodes were fixed to underlying structures. Similarly most patients (95.7%) had non- tender nodes and only 3 had tender lymphadenopathy.

Family history of tuberculosis was positive in only 15 patients (21.7%) and in rest the family history was not significant for any disease.

Diagnosis of the patients according to FNAC was found to be as follows: Caseating granulomatous lymphadenitis 39 (56.5%), Non-caseating granulomatous lymphadenitis 10 (14.5%), Reactive hyperplasia 8 (11.6%), Suppurative lymphadenitis 5 (7.2%), Lymphoproliperative disorder 4 (5.8%), Lipoma 2 (2.9%) and epidermal inclusion cyst 1 patient (1.4 %) (Table 3).

Regarding gender wise distribution of FNAC results, TB was more common in female. Also TB was more prevalent in the younger age groups with age range of 21-30 years most affected (Table 3 and 4).

The diagnosis of reactive hyperplasia was established when there was high cell density, polymorphic

Table 3: Diagnoses based on FNAC Report (N=69)

Diagnosis Based on FNAC	Frequency	Percent
Caseating Granulomatous Lymphadenitis	39	56.5
Non Caseating Granulomatous Lymphadenitis	10	14.5
Reactive Hyperplasia	8	11.6
Lymphoproliperative Disorder	4	5.8
Suppurative lymphadenitis	5	7.2
Epidermal Inclusion Cyst	1	1.4
Lipoma	2	2.9
Total	69	100.0

Table 4: Gender Wise Distribution of FNAC Results (N=69)

F NAC	Sex		Total
	Male	Female	
Caseating Granulomatous Lymphadenitis	13 (33.3 %)	26 (66.7 %)	39
Non Caseating Granulomatous Lymphadenitis	4 (40 %)	6 (60 %)	10
Reactive Hyperplasia	3	5	8
Lymphoproliperative Disorder	2	2	4
Suppurative lymphadenitis	2	3	5
Epidermal Inclusion Cyst	1	0	1
Lipoma	1	1	2
Total	27	42	69

patterns of cells and considerable number of tingible bodies macrophages.

The aspirates from lymphnodes were diagnosed as tubercular lymphadenitis based on the presence of epithelioid cell granuloma and caseous necrosis with or without langhan's giant cells in a milieu of parent lymphoid cells. However none of the slides from cases were positive for Ziehl-Neelsen staining.

Granulomatous lymphadinitis was diagnosed on the presence of epithelioid cell granuloma with or without giant cells and with absence of necrosis. Diagnosis of suppurative lymphadenitis was made when slides showed predominantly polymorphonuclear leukocytes, necrotic debris and other lymphoid cells.

Table 5: Age wise distribution of FNAC Results (N=69)

Different Age Groups (years)	Caseating Granulomatous Lymphadenitis	Non Caseating Granulomatous Lymphadenitis	Reactive Hyperplasia	Lympho proliperative Disorder	Other	Total
10 or Less	1	2	1	0	1	5
11-20	9	1	2	2	1	15
21-30	16	5	3	2	5	31
31-40	7	1	1	0	1	10
41-50	5	1	0	0	0	6
51-60	1	0	1	0	0	2
Total	39	10	8	4	8	69

DISCUSSION

In this study we determined frequency distribution of fine needle aspiration cytology findings of lymph node aspirates. Fine needle aspiration cytology is a simpler, safe, cost effective, time saving and easily available diagnostic modality. The patient is free from the scar of operation. FNAC in most cases is conclusive and thus in appropriate clinical setting help reach a final diagnosis.

In our study, male to female ratio was 1:1.5, with female preponderance. This trend was also seen in other studies from subcontinent.[10,11,] However some studies from subcontinent show male preponderance.[12, 13] In this study female predominance was also noted in patients with FNAC diagnoses of TB. No definite reason has been found for this female predilection in patients with TB in this study and also similar results have been reported from other studies from this part of the world.[10,11] Similarly most patients with diagnosis of TB lymphadenitis were young adults with age between 21-30 years. These results are consistent with the findings of other studies from Africa and India.[14,15]

Tuberculous lymphadenitis was the most common diagnosis in our study accounting for 49 (70 %) cases. Reactive hyperplasia and Lymphoproliperative disorder or lymphoma were the next common findings on FNAC including 8 cases (11.6 %) and 4 caes (5.8 %) respectively. These results are comparable to that reported by Iqbal et al, [16] from Karachi and Fazal-i-wahid et al, [17] from Peshawar. However a study from Dhaka reported a relatively higher proportion of patients with reactive hyperplasia (30 %) and lower proportion with tuberculosis (33 %) as compared to our study.[18] Moreover most studies from western counties reported a high incidence of malignant cases and lower proportion of nonmalignant lymph adenopathy.[19] This contrast in results may partly be attributed to the fact that TB is much less prevalent in the west.

Although, in this study, the most common finding on FNAC was caseating granulomatous lymphadenitis, acid fast bacilli were not seen in a single case. The detection of characteristic beaded rode shaped acid fast bacilli depends on the number of organism, previous antituberculous treatment and host immunity. Atleast 10,000 organisms per milligram of tissue must be present to be identified by a special acid-fast stain. This is the reason for non-visibility of bacilli in various studies.[20, 21]

In the current study we noted a significant relationship between pathologic findings and size of lymphadenopathy. The size of benign nodes was mostly equal or less than 2 cm in 87.5% of all patients, whereas malignant nodes were over 2x2 cm in 78.9% of all malignant cases. These finding s were in accordance with that reported by Tilak et al.[22]

There was a significant relationship between consistency of lymph node and pathologic findings. In this study most patients with granulumatiuos lymadenitis had firm lymph nodes and those few patients with hard consistency had FNAC consistent with malignancy. Although this finding is favoured by many authors, some studies confirm that consistency of lymph node cannot predict whether lymphadenopathy is benign or malignant.[23]

We also noted significant relationship between pathologic findings and mobility of lymph nodes. Most of those lymph nodes that were mobile were non malignant. Although this finding is supported by some authors,[23] other have shown that mobility of

lymphadenopathy alone is not enough to determine whether it is benign or malignant. Fixed lymph nodes adherent to surrounding tissues are usually due to metastasis while lymph nodes in lymphomas are usually mobile.[24]

The accuracy of cytology, immunocytochemistry and transmission electron microscopy (TEM) using biopsy results as gold standard in diagnosing tumor category are 78% by cytology and 91% by biopsy.[10] The role of FNAC for the initial diagnosis and subclassification of primary lymphoid malignancy is still controversial and the cytological diagnosis of lymphoma on FNAC is still very often followed by tissue biopsy in most cases. But in a resource challenged environment like ours, FNAC still remains the most acceptable, cheap and easily accessible modality for the diagnosis of metastatic lymphadenopathy.

Multiple studies have demonstrated high accuracy rates (more than 90 %) for diagnosing adenitis by FNAC, using granulomatous inflammation and/or caseation as diagnostic criteria[25-27] This high diagnostic accuracy rate highlights the importance of FNAC as a diagnostic procedure in countries with high frequency of TB adenitis, like Pakistan, as demonstrated in this study and another recent study from Karachi. [13]

CONCLUSION

Cervical lymphadenopathy is a common disease in our society and is caused by tuberculosis in majority of the cases. Most patients presenting with TB lymphadenopathy are young, particularly young females. FNAC is a useful and reliable diagnostic tool in the evaluation of these lymph nodes. FNAC is both time saving and cost effective specifically in TB endemic population like Pakistan as it alone is enough to reach the final diagnosis and hence start treatment without wasting time. In conclusion FNAC of lymph nodes proved to be useful tool in diagnosing both neoplastic and non-neoplastic lesions.

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