FINE NEEDLE ASPIRATION CYTOLOGY IN LYMPH NODES WITH SPECIAL REFERENCE TO TUBERCULOUS LYMPHADENOPATHY

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ABSTRACT

BACKGROUND
FNAC provides an alternative to excision biopsy for lymph nodes and is an easy procedure for collection of material for cytomorphological and bacteriological examination.

Aims and Objectives: To analyse the utility and diagnostic importance of FNAC in lymph node disease. To assess the cytomorphological features and incidence of various lymph nodes diseases on FNAC. To study the cytomorphological pattern of tuberculous lymphadenitis in the population in and around SIMS. To correlate the acid fast bacilli (AFB) positivity with cytomorphological patterns.

MATERIALS AND METHODS
The study was a descriptive cross-sectional study carried out from July 2016 to June 2017 in Department of Pathology, Saraswathi Institute of Medical Sciences, Anwarpur, Pilkhuwa, Hapur, U. P. The inclusion criteria included patients with clinical presentation of lymph node enlargement with non-specific complaints. All patients were of age group 20 - 60 years. Consent to participate in the test was taken. Fine needle aspiration cytology (FNAC) was performed on enrolled patients by the pathologist. The following staining methods were used: May-Grunwald-Giemsa Staining, Papanicolaou Staining and Ziehl-Neelsen Staining.

RESULTS
In this study a total number of 100 cases of lymphadenopathy were studied, out of which 95% were benign and 5% were malignant. In our study, most common lesion on cytology was found to be tuberculous lymphadenitis (40%). In the present study, the lesions were seen in all age group ranging from 20 years with a mean age of 35.64 years. Maximum cases were seen between 20 - 30 years. Out of 100 cases, 46% were male and 54% were female with significant female preponderance; 23:27 (M:F) sex ratio was observed. In our study, cervical lymph nodes (70%) were frequently involved. Tuberculous lymphadenitis was seen in 15 out of 40 (55.6%). Correlation between AFB positivity with cytomorphological patterns was seen in 36 out of 40 cases.

CONCLUSION
FNAC can be performed as an outpatient department procedure. The procedure is safe, well accepted by patients, very cost effective and requires minimum instrumentation in comparison to excision biopsy.

KEY WORDS
FNAC, Lymph Nodes, Tuberculous.


BACKGROUND
Fine needle aspiration cytology (FNAC) is a safe, cost effective and conclusive procedure.1 Lymph nodes are an integral component of the immune system and are a common presentation in the clinical practice. Cervical lymphadenopathy is a common clinical finding and may be sign of an indolent inflammation, infection or a malignant disorder, depending upon many factors including the geographical condition and socio-economical setup.2-4 In our country, infective (tubercular) lymphadenopathy is quite common.

Tuberculosis (TB) is an infectious disease caused by various strains of mycobacteria, usually Mycobacterium Tuberculosis in humans. It is an airborne disease and most commonly affect lungs where it is called Pulmonary Tuberculosis. One-third of the world’s population is currently infected, and more than 1.5 million people die each year due to tuberculosis. Among these, about 15 - 20% of cases are...
reported as having only extrapulmonary involvement where the infection occurs in other parts of the body.\(^8\)

In previous years a number of studies had been conducted on different aspects of Tuberculosis in western part of Uttar Pradesh, but no such study has been carried out in SIMS Hospital which mainly covers a rural based population. This study was conducted to describe the cytomorphological features and percentage of various lymph nodes diseases on FNAC and to assess correlation between FNAC and ZN staining in diagnosis of tuberculous lymphadenitis.

Objectives
- To assess the cytomorphological features and incidence of various lymph nodes diseases on FNAC.
- To study the cytomorphological pattern of Tuberculous lymphadenitis in the population in and around SIMS.
- To correlate the acid fast bacilli [AFB] positivity with cytomorphological patterns.

MATERIALS AND METHODS

Study Design
The study was a descriptive study.

Study Period
The study period was from July 2016 to June 2017.

Study Place
Department of Pathology, Saraswathi Institute of Medical Sciences, Anwarpur, Pilkhuwa, Hapur, U. P.

Inclusion Criteria
Patient with clinical presentation of lymph node enlargement with non-specific complaints. All patients of age group 20 - 60 years, clinically suspected cases of tubercular lymphadenitis. Cases with representative and adequate cellularity. Consent to participate in the test.

Exclusion Criteria
- Patient not willing to participate in the study.
- Swelling other than lymph node origin.
- Swelling size less than 5 cm.
- Patient undergoing treatment for any other chronic disease.

Sample Size
Patients fulfilling all inclusion and exclusion criteria was enrolled in the study. A written informed consent was obtained from all subjects before their enrolment in the study.

Method of Collection of Data
Aspiration of the lymph node was done after eliciting detailed history of the patient, i.e. age, sex, site and duration of involvement, any other investigations performed, thorough clinical examination.

Study Tools
Procedure and Methodology.

The study was performed after approval by hospital ethical committee. Hundred patients were included in the study. Patients with clinical presentation were reviewed.

Patient's presentation such as the size, location and character of adenopathy along with any associated physical findings were assessed. Erythema, tenderness, warmth and fluctuance suggests lymphadenitis and node that is fixed (non-moveable), matted together. Fine needle aspiration cytology (FNAC) was performed on enrolled patients by the Pathologist. Aspiration of enlarged lymph node was performed on enrolled patients by the Pathologist. Aspiration of enlarged lymph node was performed free hand using a 23-G needle mounted on a Cameco handle. The swellings were made prominent. They were cleaned with 70% isopropyl alcohol. Aspirated material after preparing smears on the glass slides are fixed in 95% ethyl alcohol for staining.

The following Staining Methods were used
1. May-Grünwald-Giemsa Staining.
2. Papanicolaou Staining.

Statistical Analysis
All data was collected and verified. Collected data was subjected to SPSS (version 20) for analysis. Data was expressed as frequencies for all the parameter; Chi-square test was performed to visualise the difference. P value of 0.05 was considered significant.

RESULTS

<table>
<thead>
<tr>
<th>Gender</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>54</td>
<td>54</td>
</tr>
<tr>
<td>Male</td>
<td>46</td>
<td>46</td>
</tr>
</tbody>
</table>

Table 1. Gender-Wise Distribution

Out of total 100 cases, 46 were male patients and remaining 54 were females.

<table>
<thead>
<tr>
<th>Unilateral</th>
<th>Bilateral</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right</td>
<td>Left</td>
</tr>
<tr>
<td>Frequency</td>
<td>Percent</td>
</tr>
<tr>
<td>48</td>
<td>45</td>
</tr>
<tr>
<td>48.0</td>
<td>45.0</td>
</tr>
</tbody>
</table>

Table 2. Site Distribution

Most of the lymphadenopathy cases were unilateral and out of which 48% were from right side and 45% were from left side and remaining 7% were bilateral.

<table>
<thead>
<tr>
<th>Location</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal wall</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Axilla</td>
<td>5</td>
<td>5.0</td>
</tr>
<tr>
<td>Breast</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Cervical</td>
<td>70</td>
<td>70.0</td>
</tr>
<tr>
<td>Chest wall</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Inguinal</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Mandible</td>
<td>1</td>
<td>1.0</td>
</tr>
<tr>
<td>Neck</td>
<td>3</td>
<td>3.0</td>
</tr>
<tr>
<td>Submandibular region</td>
<td>9</td>
<td>9.0</td>
</tr>
<tr>
<td>Submental</td>
<td>8</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Table 3. Location of Affected Lymph Nodes

In this cervical lymphadenopathy was most commonly involved lymph nodes followed by submandibular lymph nodes.
Blood mixed aspirates were most commonly seen in 45% of total cases followed by pus-like material in 30% of cases.

<table>
<thead>
<tr>
<th>Aspirate</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bloody</td>
<td>45</td>
<td>45.0</td>
</tr>
<tr>
<td>Cheesy</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td>Pus like</td>
<td>30</td>
<td>30.0</td>
</tr>
</tbody>
</table>

*Table 4. Colour of Aspirate*

Cytological Diagnosis | Incidence
---------------------|---------|
Generalised lymphadenopathy | 33 |
Tuberculous lymphadenopathy | 40 |
Hodgkin’s lymphoma | 1 |
Reactive hyperplasia | 13 |
Non-specific | 8 |
Cardioma | 5 |

*Table 5. Incidence of Lymph Node Diseases*

<table>
<thead>
<tr>
<th>Age (in Years)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>41</td>
<td>41.0</td>
</tr>
<tr>
<td>31-40</td>
<td>27</td>
<td>27.0</td>
</tr>
<tr>
<td>41-50</td>
<td>18</td>
<td>18.0</td>
</tr>
<tr>
<td>&gt;50</td>
<td>14</td>
<td>14.0</td>
</tr>
</tbody>
</table>

*Table 6. Age-Wise Distribution*

Mean age is 35.64 years. Out of 100 cases, 41 cases were in the age group of 20-30 yrs.

<table>
<thead>
<tr>
<th>Age (in Years)</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-30</td>
<td>41</td>
<td>41.0</td>
</tr>
<tr>
<td>31-40</td>
<td>27</td>
<td>27.0</td>
</tr>
<tr>
<td>41-50</td>
<td>18</td>
<td>18.0</td>
</tr>
<tr>
<td>&gt;50</td>
<td>14</td>
<td>14.0</td>
</tr>
</tbody>
</table>

*Table 7. Association of Cytological Diagnosis with Age*

Cytomorphological Pattern | Number (%)
--------------------------|-------------
Epithelioid granuloma with caseous necrosis | 6 (6%)
Epithelioid granuloma without necrosis | 5 (5%)
Necrosis only without granuloma | 17 (17%)
Polymorphs with necrosis | 12 (12%)

*Table 8. Cytomorphological Pattern Frequency in Tuberculous Lymphadenitis*
Chandanwale S et al,25 where Sharma P et al26 reported maximum no. of cases during 11 - 20 years.

Tuberculous lymphadenitis peak incidence was seen during 2nd decade. 15 cases out of 40 (55.6%) cases of tuberculosis lymphadenitis were recorded. Similar findings were seen in study done by Khajuria R et al.14

The most common age group which presented with lymphadenopathy was between 20 - 30 years of age followed by 31 - 40 years, 41 - 50 years and more than 50 years; majority of patients were in the second to fourth decades of life in studies by Paliwal et al,27 Ergete and Bekele et al,28 Purohit et al,29 Dandapat et al,30 Ahmad et al12 and Hemlata et al.30

Out of 100 cases, 46% were males and 54% were females with significant female preponderance; 23:27 (M: F) sex ratio was observed in our study. This may be because of malnutrition and overall low living standards among females in this area. Female preponderance has also been observed by Fatima et al,13 Paliwal et al,27 Ergete and Bekele et al,28 Purohit et al,29 Chand et al31 and Pamra et al.32 Male predominance was noticed by Ahmad et al12 and Rajakaran et al.33

In our study, cervical lymph nodes (70%) were frequently involved followed by 9% Submandibular, 8% Submental, 3% Neck, 1% Inguinal, 1% Mandible and 1% Chest wall and 1% Breast and 1% Abdominal wall. This was in concordance with Bezabih et al14 who observed cervical involvement in 74.2% of cases. Khajuria R et al14 also found cervical lymph node to be most commonly involved. Hirachand et al35 showed 74.6% involvement of cervical lymph nodes by various lesions. Many others (Pandit et al16 1987; Ahmad et al12 2005; Nidhi et al, 2011) also found cervical region to be the most common site of involvement.

Most common cytological pattern seen was necrosis only without granulomas in 17% of cases and polymorphs in 25% cases. ZN staining for acid fast bacilli was seen in 90% cases. Ergete and Bekele et al28 reported 71.7% Chand et al31 reported 44.54%, Bezabih et al14 reported 59.5%, Dasgupta et al38 reported 45.6% AFB positivity in their studies. On the other hand, a low positivity rate of AFB positivity of (19.6% cases) on ZN staining was reported by Agarwal et al in their study.

High AFB positivity noted in our study may be because of extensive screening done as in addition to one ZN stained smear in each case, we got ZN staining done on second smear or decolourised smear where cytology suggested tuberculosis, especially when necrosis was present.

According to gross nature of aspirate, blood mixed aspirates were noted in 45% followed by purulent/ pus material in 30% and caseous/ cheesy material in 25% cases in current study, whereas Hemalatha et al observed blood mixed aspirates in 87.3% and purulent-to-cheesy material in 12.7% cases.

CONCLUSION
In conclusion, it was found that female predominance was observed in our study. Commonest lymph node involved was cervical followed by submandibular. Most common lesion on cytology was found to be tuberculous lymphadenitis (40%)

followed by generalised lymphadenopathy (33%), reactive hyperplasia (13%), non-specific (8%) metastatic carcinoma (9%) and Hodglin's lymphoma (1%). In gender-wise classification, tuberculous lymphadenitis was 27 in females and 13 in males. It can be concluded that FNAC can be performed as outpatient department procedure, it is cost effective and requires minimum instrumentation in comparison to excision biopsy. Using FNAC diagnostic accuracy is high in tuberculous lymphadenopathy. Therefore, even in most remote areas, FNAC can be used for diagnosing tuberculous lymphadenopathy. Coupling FNAC with ZN staining increases the diagnostic accuracy. Diagnostic accuracy can be further increased by submitting some material obtained by FNA for culture.

REFERENCES


