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**Original Research Article**

# Cytological spectrum of lymph node lesions in fine needle aspiration cytology

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## ABSTRACT

**Background:** Fine needle aspiration cytology (FNAC) is becoming preoperative method of choice for diagnosis and management of various lumps and lesions since few decades. It helps clinician to decide mode of treatment in most cases in both non-neoplastic and neoplastic disorders. As cervical, axillary and inguinal lymphadenopathies are commonly encountered clinical problems, in this study, we evaluated the utility of FNAC for assessment of lymphadenopathy.
**Methods:** This was a retrospective observational study done during the period between January 2016 to December 2019 in a private laboratory centre affiliated with private multispeciality hospital in Bhopal Madhya Pradesh. The FNAC procedure was done without radiological guidance for palpable lymph nodes of cervical, axillary, and inguinal regions. 10ml syringe and 23/24-gauge needles were used along with a plunger for FNAC procedure. Smears were made by standard smearing technique. Slides were stained with Papanicolaou (PAP), Lieshman and Giemsa stain and Diff-Quik methods. Ziehl-Neelson (ZN) staining for acid fast bacilli was done wherever required.
**Results:** Total 128 cases of lymphadenopathy were assessed. Cervical lymph nodes were most commonly (77.3%) involved and reactive lymphadenitis (34.3%) was most common diagnosis on FNAC. Tubercular lymphadenitis was most common in young adults and reactive nonspecific lesions were most common in paediatric group. Metastatic carcinomas were most common after 50 years age group.
**Conclusions:** Fine needle aspiration is simple, rapid and cost-effective method to know the cause of lymphadenopathy and also a reliable method to categorize the cause of lymphadenopathy into reactive, inflammatory, metastatic, and lymphoproliferative, avoiding the necessity of biopsy.

**Keywords:** FNAC, Lymph node, Lymphadenopathy, Morphology

## INTRODUCTION

Lymphadenopathy is one of the commonest clinical presentations of patients, attending the outdoor clinics in most hospitals. The etiology for lymphadenopathy varies from an inflammatory process to a malignant condition.[1]

FNAC is simple, fast, cost effective and well established diagnostic cytological method.[2] It is used as initial investigation for determining various pathologies of lymph nodes. It helps clinician to decide whether to treat that lesion or followed up as in reactive lymph nodes which themselves do not require treatment. FNAC has also been advocated as a useful method in comparison to more expensive surgical excision biopsies in developing countries with limited financial and health care resources.[3]

There are many advantages of FNAC over trucut biopsy. First, it's an office procedure and there is no specific need for any prior hematological workup. Second, material adequacy can be checked quickly, and repeat

FNAC can be done at the same time. Moreover, FNAC has an extremely low complication rate.

This method evolved over time with better techniques with radiological guidance methods for better sensitivity and specificity and addition of ancillary tests like immunocytochemistry, culture and cytogenetic studies made it even more useful.[4] In this study, we evaluated the utility of FNAC for assessment of lymphadenopathy.

## METHODS

This was a retrospective observational study done during the period between January 2016 to December 2019 in a private laboratory centre affiliated with a private multispeciality hospital in Bhopal Madhya Pradesh. A total 128 cases of lymphadenopathy coming to laboratory centre were included in the study. Proper aseptic precautions and consent were taken before the procedure. The FNAC procedure was performed in the laboratory procedure room. The FNAC procedure was done without radiological guidance for palpable lymph nodes of cervical, axillary, and inguinal regions.

The 10 ml syringe and 23/24-gauge needles were used along with a plunger for FNAC procedure. The 10 ml syringe creates good negative pressure and 23/24-gauge needles provide good material with minimal blood. While fixing the swelling between two left fingers needles were introduced in the lymph node and to and fro motion was done three to four times with creation of negative pressure in the syringe simultaneously to obtain material. In few cases when lymph nodes were too small and slippery non-aspiration technique was used with only needle. Non aspiration technique is known to yield good material with very less haemorrhage.

Material obtained was expressed on the slide and smears were made by standard smearing technique. slides were stained with Papanicolaou (PAP), Lieshman and Giemsa stain and Diff-Quik methods. Ziehl-Neelson (ZN) staining for acid fast bacilli was done wherever required.

After the FNAC procedure was performed, slides with Diff-Quik stain were stained immediately and they were checked for material adequacy. If the diagnostic material was not present on the slides, another attempt of FNAC was performed.

## RESULTS

There were total of 128 cases of lymphadenopathy. Out of total 128 cases majority of the patients were females (55.5%). Most of the patients were in the age group of 16-35 years (34.4%). The most common site of FNAC was a cervical lymph node and reactive lymphadenitis (34.3%), followed by tuberculous lymphadenitis (30.4%) was the most frequent diagnosis on FNAC. Metastatic carcinoma cases were 12 (9.4%) and only 2 (1.6%) cases of lymphoma were found, one was Hodgkin's lymphoma, and one was non-Hodgkin's lymphoma. Among the metastatic malignancies six were poorly differentiated carcinomas, four were squamous cell carcinomas and two were adenocarcinoma out of 12 metastatic malignancies. Descriptive statistics of the population under study are shown in Table 1.

**Table 1: Clinicopathological features of population under study.**

| Clinicopathological feature | N (%) |
|---|---|
| **Gender** | |
| Male | 57 (44.5) |
| Female | 71 (55.5) |
| **Age groups (years)** | |
| ≤15 | 33 (25.8) |
| 16-35 | 44 (34.4) |
| 36-50 | 30 (23.4) |
| >50 | 21 (16.4) |
| **Site of LN enlargement** | |
| Cervical | 99 (77.3) |
| Axillary | 12 (9.4) |
| Inguinal | 17 (13.3) |
| **Diagnosis on FNAC** | |
| Reactive lymphadenitis | 44 (34.3) |
| Acute suppurative lymphadenitis | 10 (7.8) |
| Tuberculous lymphadenitis | 39 (30.4) |
| Metastatic carcinoma | 12 (9.4) |
| Chronic granulomatous lymphadenitis | 11 (8.6) |
| Chronic non specific lymphadenitis | 9 (7) |
| Lymphoma | 2 (1.6) |
| Necrotizing lymphadenitis | 1 (0.8) |

Metastatic carcinoma and lymphoma were more commonly seen in males, whereas reactive lymphadenitis, Tuberculous lymphadenitis and acute suppurative lymphadenitis were more commonly seen in females (Table 2).

**Table 2: Sex distribution of lymph node lesions.**

| Variables | Male (%) | Female (%) | Total |
|---|---|---|---|
| **Reactive lymphadenitis** | 20 | 24 | 44 |
| **Acute suppurative lymphadenitis** | 3 | 7 | 10 |
| **Tuberculous lymphadenitis** | 15 | 24 | 39 |
| **Metastatic carcinoma** | 8 | 4 | 12 |
| **Chronic granulomatous lymphadenitis** | 5 | 6 | 11 |
| **Chronic non-specific lymphadenitis** | 4 | 5 | 9 |
| **Lymphoma** | 2 | 0 | 2 |
| **Necrotizing lymphadenitis** | 0 | 1 | 1 |
| **Total** | 57 | 71 | 128 |

Reactive lymphadenitis seen more frequent in younger age group (<15 years), tuberculous lymphadenitis noted more frequently in middle age group (16-35 years) whereas metastatic carcinoma was more commonly seen in older age group (>50 years) shown in Table 3.

Table 4 shows site of nodal involvement of lesions. All lesions noted more commonly in cervical lymph nodes.

**Table 3: Age distribution of lesions.**

| Variables | ≤15 years | 16–35 years | 36–50 years | >50 years | Total |
|---|---|---|---|---|---|
| **Reactive lymphadenitis** | 24 | 10 | 8 | 2 | 44 |
| **Acute suppurative lymphadenitis** | 0 | 6 | 2 | 2 | 10 |
| **Tuberculous lymphadenitis** | 5 | 17 | 10 | 7 | 39 |
| **Metastatic carcinoma** | 0 | 2 | 4 | 6 | 12 |
| **Chronic granulomatous lymphadenitis** | 2 | 4 | 3 | 2 | 11 |
| **Chronic non-specific lymphadenitis** | 2 | 3 | 2 | 2 | 9 |
| **lymphoma** | 0 | 1 | 1 | 0 | 2 |
| **Necrotizing lymphadenitis** | 0 | 1 | 0 | 0 | 1 |
| **Total** | 33 | 44 | 30 | 21 | 128 |

**Table 4: Site of nodal involvement of lesions.**

| Variables | Cervical | Axillary | Inguinal | Total |
|---|---|---|---|---|
| **Reactive lymphadenitis** | 37 | 2 | 5 | 44 |
| **Acute suppurative lymphadenitis** | 6 | 2 | 2 | 10 |
| **Tuberculous lymphadenitis** | 33 | 3 | 3 | 39 |
| **Metastatic carcinoma** | 9 | 1 | 2 | 12 |
| **Chronic granulomatous lymphadenitis** | 6 | 3 | 2 | 11 |
| **Chronic non-specific lymphadenitis** | 5 | 1 | 3 | 9 |
| **Lymphoma** | 2 | 0 | 0 | 2 |
| **Necrotizing lymphadenitis** | 1 | 0 | 0 | 1 |
| **Total** | 99 | 12 | 17 | 128 |

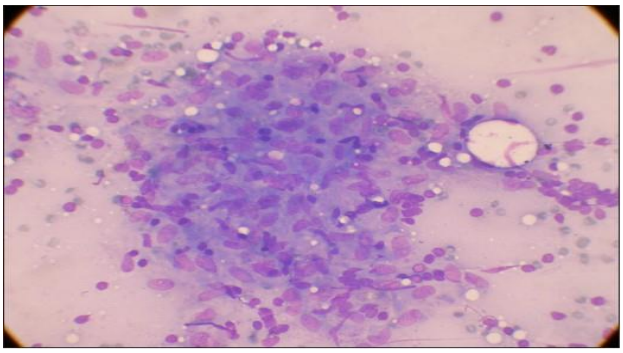

**Figure 1: FNAC smear showing epithelioid (Leishman, ×40).**

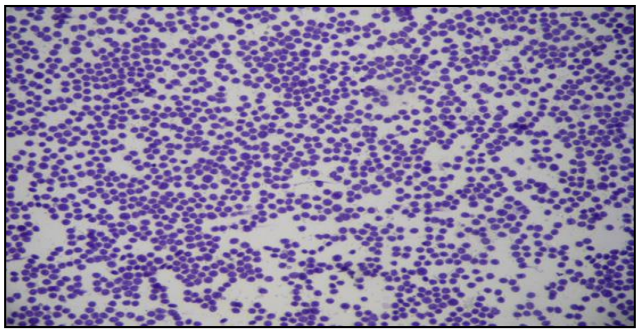

**Figure 2: NHL Papanicolaou stain ×10.**

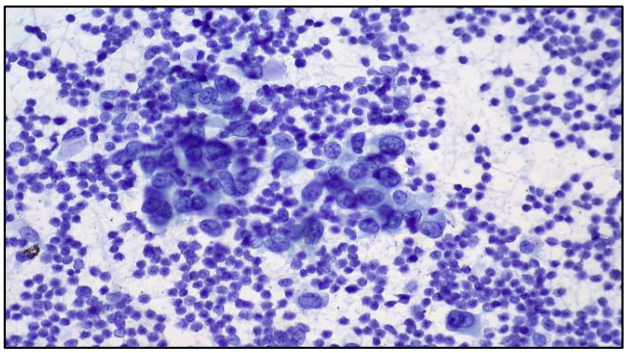

**Figure 3: Metastatic adenocarcinoma in lymph, (Geimsa, ×40).**

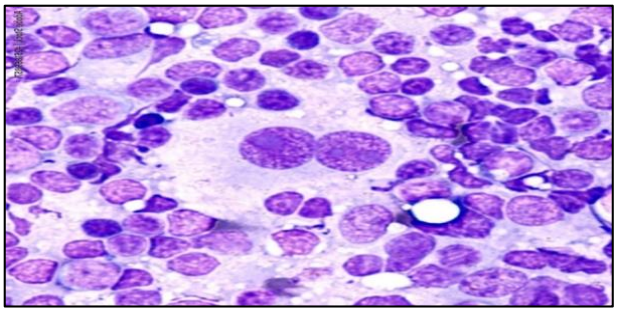

**Figure 4: Hodgkin's Lymphoma showing node Reed Sterberg cell (Geimsa, ×40).**

## DISCUSSION

Lymphadenopathy is one of the most common clinical problems posing diagnostic difficulties and tuberculous lymphadenopathy is the commonest manifestation of extra-pulmonary tuberculosis where cervical groups of lymph nodes are most frequently involved. In this study, we found that FNAC is a highly diagnostic technique in the evaluation of superficial lymphadenopathy of cervical, axillary, and inguinal regions. We also noted that tuberculous lymphadenitis was the most common in middle age group, in the younger age group, reactive lymphadenopathy was more common, in contrast to the older age group where metastatic carcinoma was more frequent.

Young adults (16-35 year) were most commonly affected by lymphadenopathy in our study. This finding is in accordance with other studies.[5,6] In few studies' older population (>40 years) was most predominant group.[8]

Female population was little more common in our study group compared to male population. This finding is in accordance with other studies.[5,6] But in contradiction with studies of Chawla et al and Qadri et al where in male population were more in the study group compared female population.[7,8] However, few literatures showed male preponderance, and few showed female preponderance in their study groups.

Suppurative lesions were more common in females than males in our study in accordance with Reddy et al.[5] Metastatic lesions were more common in males compared to females which is in accordance with Reddy et al and Qadri et al.[5,8]

Tubercular/granulomatous lymphadenopathy were also common in females in this study which is in accordance with Hashmi et al.[5] The most common group of lymph nodes involved in our study was cervical group of lymph nodes. This finding is similar to other studies.[5,6,8,9]

In this study most of the cases were found of reactive lymphadenitis. Chawla et al, Mohanty et al, Duraiswami et al, Shrivastav et al and Vare et al found reactive lymphadenitis as most common morphological pattern of lymphadenopathy.[7,9-12] Goneppanavar et al, Hashmi et al, Kumar et al found Tuberculous lymphadenitis as the most common cytological diagnosis on FNAC in their study.[4,6,13] It could be because their study composed more of adult population than paediatric population as granulomatous lymphadenitis is most common cause of lymphadenitis in case of adult population as per most literature. Reactive lymphadenopathy is predominant cause in paediatric age group in accordance with most literature.

In this study after reactive and tubercular next group was of metastatic malignancy. Most cases of metastatic malignancies were poorly differentiated carcinoma, 4 were squamous cell carcinomas and two were adenocarcinoma out of 12 metastatic malignancies.[6] These findings are in consistence with most literatures.

There were a few limitations to our study. First, the biopsy was not performed in all these cases to determine the sensitivity, specificity, and diagnostic accuracy of FNAC. Diagnostic material obtained by FNAC is considered of inferior quality than trucut/core needle biopsy, especially for the diagnosis of lymphomas. Second, clinical, and radiological information of the patients were not available for correlating the cytology findings clinically.

## CONCLUSION

Despite its limitations, FNAC appears as a good first line method for investigating the cases of lymphadenopathy and also a simple, rapid, cost effective and minimally invasive method to know the cause of lymphadenopathy. It has definitely and significantly reduced unnecessary surgical biopsy for diagnosis of lymphadenopathies. Categorization of the cause of lymphadenopathy into reactive, inflammatory/infectious, metastatic, and lymphoproliferative disorder can be reliably done by FNAC, avoiding the need for truct/excisional biopsy. It not only helps clinician in early detection of lesion but also helps in early plan of treatment especially in metastasis and lymphoma. In patients without previous diagnosis of malignancy, FNAC not only confirms metastatic deposit, but in most conditions gives a clue regarding site of primary.

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