

Original Research Article**Cytomorphological Features in Fine Needle Aspiration Cytology (FNAC) of Non-Neoplastic Lymph Node Lesions****Harika Mandava¹, S.S. Hiremath², S.S. Inamdar³, Deepak Gopinath⁴**

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Abstract

Introduction: Lymphadenopathy is a commonly encountered clinical problem. Fine needle aspiration cytology offers immediate preliminary diagnosis. In routine practice <1% of patients with peripheral lymphadenopathy will be having malignant process. This necessitates the study on non-neoplastic lesions of lymph node.

Objectives: 1. To study the spectrum of non-neoplastic lymph node lesions diagnosed by FNAC

2.To study cytomorphological features of various non-neoplastic lymph node lesions by FNAC

3. To correlate with histopathology wherever possible

Methods: This was a two year study from January 2016 to December 2017 conducted in SNMC and HSK hospital and 286 patients with non-neoplastic lymph nodes were included in the study. Lymph node aspiration was done, smears were prepared, fixed, stained with H&E and Pap. Air dried smears were stained with Giemsa and ZN.

Results: The age ranging from 1 month to 85 years. Majority were reactive lymphadenitis (173/286) followed by tuberculous lymphadenitis (49/286), granulomatous lymphadenitis (22/286), acute suppurative lymphadenitis (34/286), Idiopathic necrotizing lymphadenitis (5/286), kimura's disease (1/286), Rosai-Dorfman disease (1/286), filariasis (1/286). Histopathology was available in 26 cases of which 24 cases on biopsy confirmed the cytological diagnosis. Rest two cases were false negative. In remaining cases lymphadenopathy subsided with appropriate therapy.

Conclusion: FNAC is technically easy, rapid, cost-effective and reliable for diagnosing non-neoplastic lymph node lesions. Repeated aspirations will avoid sampling errors.

Keywords: FNAC; Non-Neoplastic Lymphnode; Lymphadenitis.

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Introduction

Lymphadenopathy is a commonly encountered clinical problem which has a multitude of causes[1]. Today, enlarged lymph nodes are one of the most frequently sampled tissues by fine needle aspiration cytology (FNAC)

[2]. Fine needle aspiration cytology offers immediate preliminary diagnosis, thus providing ample information before further management. In routine practice <1% of patients with peripheral lymphadenopathy will be having malignant process [1]. This necessitates the study on non-neoplastic lesions of lymph node which can be identified

on FNAC. The aim of this study is to study the spectrum of non-neoplastic lymph node lesions, their cytomorphological features and to correlate with histopathology wherever possible.

Methodology

This was a two year study from January 2016 to December 2017, conducted in pathology department of SNMC and HSK hospital after obtaining Ethical committee clearance. A brief clinical history, physical examination was done for the patients presenting with lymphadenopathy. Relevant investigations were obtained and patients were followed up. The procedure of aspiration was explained and consent was taken. Lymph nodes were aspirated under aseptic conditions using 23 gauge needle attached to 10 ml syringe and Franzen handle. The aspirated material was smeared on glass slides. Smears were both air dried and fixed in 95% ethanol. Air dried smear were stained with MGG and wet fixed smears were stained with H&E and Pap. Additional stains like ZN, PAS were done wherever required. The stained smears were evaluated and cytomorphological features were noted down. A total of 286 cases were considered after excluding malignant lesions and smears with inadequate material. Clinicocytological correlation was done in all cases and cyto-histological correlation was done in 26 cases.

Results

Out of total aspirated lymph nodes during this period, a total of 286 non-neoplastic lymph node lesions were included in the study. The male:female ratio in this study is 1:1.01. A slight female preponderance was noted. The age ranged from 1 month to 85 years. Majority of the cases 25.9% were seen in second decade of life. Table 1 shows the sex and age wise distribution of lymphadenopathy in the present study.

The size of the lymph nodes varied and ranged from 0.5 cms-6 cms in largest dimension. cervical group of lymph nodes were more commonly involved constituting 66.7% followed by submandibular 12.2%, axillary in 6.3%, supraclavicular in 5.6%, submental 3.8%, inguinal 3.8% and epitrochlear 0.4% of total cases. There are three cases of generalised lymphadenopathy. Table 2 shows site wise distribution of cases of lymphadenopathy.

FNAC diagnosis was reactive lymphadenitis in 173 cases followed by tuberculous lymphadenitis in 49 cases, Table 3 shows the incidence of various lesions in this study

In this study, incidence of reactive lymphadenitis is highest in second decade of life i.e, 52 cases(30%). The criteria by which reactive lymphadenitis was diagnosed was polymorphous population of lymphoid cells with tingible body macrophages, lymphoglandular bodies. The

Table 1: Sex and age wise distribution of lymphadenopathy

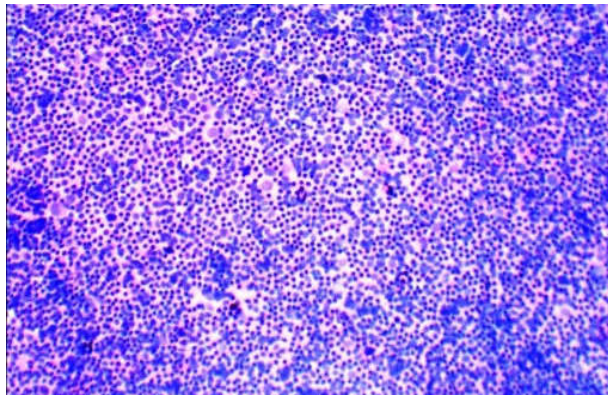
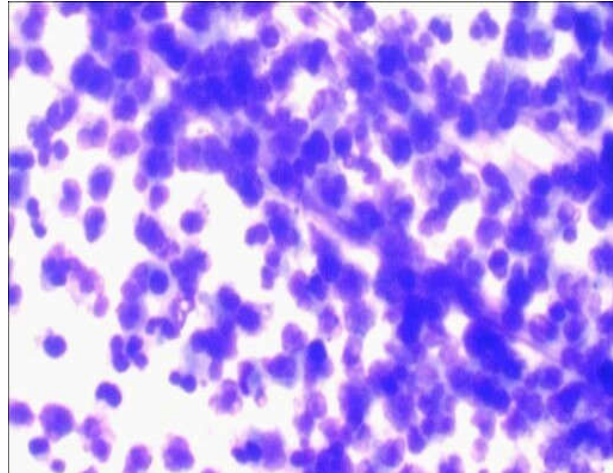
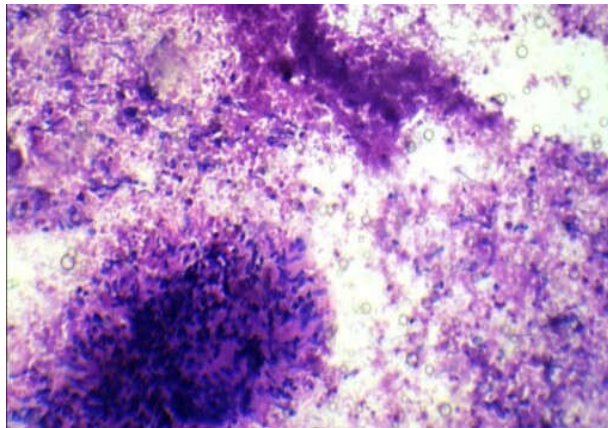
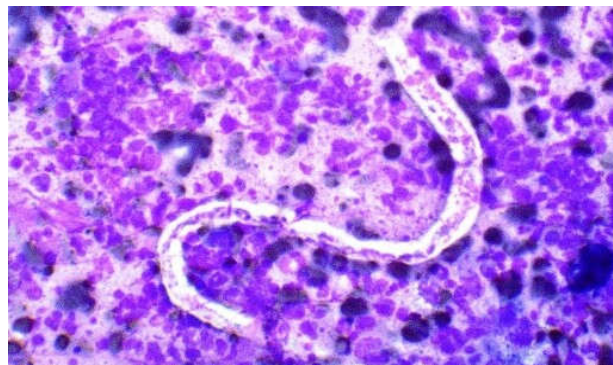
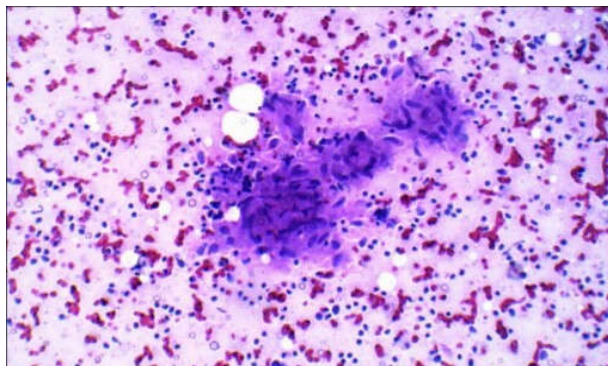
Age	Males	Females	Total
0-9	36	17	53 (18.5%)
10-19	40	34	74 (25.9%)
20-29	27	36	63 (22.0%)
30-39	17	22	39 (13.6%)
40-49	12	16	28 (9.8%)
50-59	02	08	10 (3.5%)
60-69	07	07	14 (4.9%)
70-79	01	03	04 (1.4%)
80-89	-	01	01 (0.4%)
Total	142(49.7%)	144 (50.3%)	286 (100%)

Table 2: Site wise distribution of lymphadenopathy

Site	No. of cases	Percentage
Cervical lymph node	191	66.8%
Submandibular	35	12.2%
Axillary	18	6.3%
Supraclavicular	16	5.6%
Submental	11	3.8%
Inguinal	11	3.8%
Epitrochlear	01	0.4%
Generalised	03	1.1%
Total	286	100

Table 3: Incidence of various lesions on FNAC

FNAC diagnosis	No. of cases	Percentage
Reactive lymphadenitis	173	60.4%
Tuberculous lymphadenitis	49	17.1%
Suppurative lymphadenitis	34	11.9%
Granulomatous lymphadenitis	22	7.7%
Kikuchi's lymphadenitis	05	1.7%
Rosai-Dorfman disease	01	0.4%
Kimuras disease	01	0.4%
Lymphatic filariasis	01	0.4%
Total	286	100%

**Fig. 1:** Reactive lymphadenitis: Smear showing polymorphous population of lymphoid cells (MGG 40X)**Fig. 4:** Suppurative lymphadenitis: smear showing sheets of neutrophils with few lymphocytes(MGG 100X)**Fig. 2:** Tuberculosis: smears showing granuloma with caseous necrosis (H&E 100X)**Fig. 5:** Filariasis: Smear showing microfilaria with background lymphocytes and eosinophils. (MGG 400X)**Fig. 3:** Granulomatous lymphadenitis: Smear showing epitheloid granuloma with clean background (H&E 100x)

patients were treated with a course of antibiotics and followed up. In 17 cases with persistent lymphadenopathy, biopsy was taken. Of them 14 were correlating with cytological diagnosis of reactive lymphadenitis. The three cases which differed, one was diagnosed as Hodgkin's lymphoma, one as Tubercular lymphadenitis and another as Castleman disease which is hyaline vascular type on histopathology.

Tuberculous lymphadenitis comprised 49 cases and majority of cases (13 cases) found in third decade of life. The smears showed caseous necrosis, epitheloid cell granulomas with or without langhan's giant cells. ZN stain

was done and 11 cases (22.4%) were positive for acid fast bacilli.

Acute suppurative lymphadenitis was observed in 34 cases. Majority of cases are seen in first decade of life (20.6%). The cytological features were sheets of degenerated neutrophils, tingible body macrophages with, few lymphoid cells in the background of cellular debris. Three cases had biopsy of which two were correlating with cytological diagnosis of acute suppurative lymphadenitis and one was diagnosed as metastatic squamous cell carcinoma.

Granulomatous lymphadenitis was offered in 22 cases where there are epithelioid granulomas with lymphocytes and with or without giant cells in the clean background in the absence of necrosis. In this study, five cases have histopathological correlation of which 4 cases were diagnosed as tuberculosis and one as granulomatous lymphadenitis. In this study, there are five cases of Kikuchi's disease. The cytological features of the smears showed abundant necrotic debris, crescent shaped macrophages with absent neutrophils.

One case of Rosai Dorfman disease was diagnosed in this study. The cytomorphology showed lymphoid population of cells, emperipolesis, tingible body macrophages, foreign body type of giant cells in the background of RBC. Biopsy of the same node was correlating with cytological diagnosis.

In our study there is one case of Kimura's disease on smears showed lymphoid population of cells lymphocytes, plasma cells, warthin-finkedely type multinucleated giant cells, numerous eosinophils and RBC.

Lymphatic filariasis was observed in one case with axillary lymphadenopathy in the present study. The smear shows lymphoid globules, mixed population of lymphocytes, with numerous eosinophils and many long and coiled micro filaria which were sheathed with a pointed end suggesting *Wuchereria bancrofti*.

Discussion

In the present study 286 cases with non-neoplastic lymph nodes lesions were considered. Patients whose smears had inadequate material were excluded.

In this study, out of 286 cases, males were 142 (49.7%) and females were 144 (50.3%). The male to female ratio is 1:1.01. Similar studies by Hafez et al showed slight female preponderance with male: female ratio of 1:1.2 [3]. However, our study is contradicting with the study done by Hirachand et. al., and Mohanty et al which showed a slight male predominance in their studies [4,5].

In the present study, age ranged from 1 month to 85 years. Majority of cases were seen in second decade 25.9% followed by 22% cases in third decade. Patil et al. have got

similar findings that majority of cases were seen in second decade followed by third decade [6]. However, study by Hirachand et al were contradicting to our study in which majority of cases were seen in third decade of life [4].

In the present study 283 cases (99%) presented with localised lymphadenopathy and three (1%) presented with generalised lymphadenopathy in whom three or more than three groups of lymph nodes were involved. In the present study, the commonest lymph node involved was cervical, seen in 191 (66.8%) cases, which was similar to other studies by Hirachand et al (50.8%), Mohanty et al (66.5%) [4,5]. Second most commonest node affected was submandibular in the present study 35 (12.2%) which was correlating with Vimal et al study where the second most common lymph node affected is (12.3%) [7]. However, our study is contrasting with Mohanty et al, where second most common group of lymph node was axillary (17.18%) [5].

In the present study, reactive lymphadenitis was the most common lesion encountered and the incidence was 60.4% of total cases. This study correlates with many other studies by Hirachand et. al., Mohanty et. al. in which the commonest lesion encountered is reactive lymphadenitis [4,5]. However, it contrasts with the study by Adhikari et. al. where tubercular lymphadenitis was the most common lesion (45.45%) [8]. In the present study, incidence of reactive lymphadenitis was high in second decade of life (30%) followed by first and third decades i.e, 22.5% and 22 % respectively. The cytological features of reactive lymphadenitis comprising of mixed population of lymphoid cells, immunoblasts, tingible body macrophages, lymphoglandular bodies in this study which was similar to the study by Pandey et. al. [9]. Patients were followed up and 17 cases with persistent lymphadenopathy biopsy of same node was done. Biopsy study correlating in 14 cases and three cases differed. Among the three, one was diagnosed as Hodgkin's lymphoma, one as tubercular lymphadenitis and other as Castleman disease. Pandey et. al. reported similar cytological and histopathological correlation for reactive lymphadenitis [8].

In our study tuberculous lymphadenitis is the second most common lesion comprising of 49 cases (17.1%). Pandey et al in their study, tuberculous lymphadenitis is the second most common lesion with an incidence of 28.6% [9]. Majority of cases in this study were seen in the third decade of life which is similar to study by Pandey et. al. [9]. The cytomorphological features of epithelioid cell granulomas and caseous necrosis is found in majority of cases. Langhan's giant cell was seen in few of the cases. Ziehl Neelsen for Acid Fast Bacilli was positive in 11 cases. Among them six were HIV1 positive cases. No biopsies were done because the clinicians were convinced with the diagnosis of tuberculosis based on the cytology, clinical presentation, and other investigations. The patients responded for anti-tubercular therapy.

Acute suppurative lymphadenitis was the second most common lesion found in the present study comprising of 34 cases (11.9%). Majority of the cases were seen in the first decade of life seven cases (20.6%), similar observation was made by Chawla et. al. [10]. The cytological features of abundant neutrophils with few lymphoid cells with degenerated cellular debris was seen in the present study which was similar to the cytological features mentioned by Chawla et. al. [10]. Repeated aspiration was advised after a course of antibiotics. Histopathological correlation was possible in three cases of which two were correlating with the cytological diagnosis of acute suppurative lymphadenitis. While one case had shown metastatic squamous cell carcinoma on histopathology. This was because SCC is known to be associated with necrosis [1,5].

In the present study 22 cases (7.7%) were granulomatous lymphadenitis. Majority of cases were seen in second decade of life. The incidence of granulomatous lymphadenitis was similar to study by Hirachand et. al. [4]. The cytological features of epithelioid cell granulomas, with or without giant cells and necrosis were seen in the present study. ZN staining was negative for AFB bacilli in all the cases. The cytological features were similar to study done by Hirachand et. al. [4].

Out of 22 cases, five cases had histopathological correlation. Only one was diagnosed as granulomatous lymphadenitis and the other four cases were diagnosed as tubercular lymphadenitis on histopathology.

In this study incidence of idiopathic necrotising lymphadenitis (Kikuchi's Disease) was seen in five cases. All the patients were below the age of 25 years. In four cases cervical node was involved and in one case submandibular lymph node was involved.

One case of Rosai-Dorfman presented with massive lymphadenopathy of size 6 X 4 cms. Biopsy of the same correlated with cytological diagnosis. In our study, there was one case of Kimuras disease and one case of lymphatic filariasis.

In this study there were 26 cases with histopathological correlation out of which 24 cases were showing non-neoplastic lesions on histopathology and two cases were false negative, possibly due to sampling error. The overall diagnostic accuracy by FNAC in our study is 92.3%. Similar to the study done by Patil et. al. and Adhikari et. al. have shown 96.4% and 90.9% respectively [6,8].

Conclusion

FNAC is an important diagnostic tool for diagnosing non-neoplastic lesions. It is technically easy, rapid, cost-effective and reliable and safe. It serves as first line investigation in developing countries like India. The high specificity of the technique helps to single out those that need further investigation or biopsy and therapeutic management. Proper clinical history, examination and repeated sampling minimises false negative cases on FNAC

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