



EXPLORING THE CYTOMORPHOLOGICAL SPECTRUM OF LYMPH NODES THROUGH FINE NEEDLE ASPIRATION CYTOLOGY

Pathology

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ABSTRACT

Lymphadenopathy is a common clinical presentation of many neoplastic and non - neoplastic diseases. Fine needle aspiration cytology (FNAC) is a simple, cost-effective and relatively non-invasive procedure and plays a pivotal role in the early detection of various lymph node pathologies, especially in resource constraint setup. **Aim:** To study the spectrum of pathologies identified on Fine Needle Aspiration (FNA) of lymph nodes in a tertiary care hospital in North-East India and to determine its frequency with respect to age and sex distribution. **Methods And Materials:** This is a retrospective study conducted in the Department of Pathology, AMCH for a duration of 2 years, from March 2022 – February 2024. The patients' demographic data, history and clinical data were obtained as per the pre-designed validated proforma during the study undertaken in Cytopathology section, Department of Pathology AMCH. **Results:** Total of 948 cases were assessed. The most common site was cervical group of lymph nodes (88%), and Tubercular Lymphadenitis (29.92%) was most common diagnosis on FNAC. Nonspecific reactive lymphadenitis was the most common in pediatric age group and Tubercular lymphadenitis was most common in young adults. Metastatic deposits were seen more commonly after 50 years age group. **Conclusion:** Fine Needle Aspiration Cytology is an easy and rapid method for diagnosing the underlying pathology of superficial enlarged lymph nodes. Judicious application of FNAC in resource limited settings reduces the need of unwanted biopsies. Tubercular, reactive, and neoplastic conditions are the common causes leading to clinical lymphadenopathy in our study.

KEYWORDS

Fine Needle Aspiration Cytology (FNAC), Lymphadenopathy, Reactive, Tuberculous, Granulomatous, Metastasis

INTRODUCTION

Lymphoid tissue, which includes the lymph nodes, spleen, tonsils, adenoids, and thymus, plays a crucial role in our immune system. The lymph nodes are vital parts of lymphatic system, found in small groups or chains, where they drain lymphatic vessels from different anatomical sites. Apart from mechanical filtration of foreign substances in the lymph, the lymph nodes encompass the crucial task of recognizing and processing antigens.²

Lymphadenopathy is a common clinical presentation of many neoplastic and non – neoplastic diseases. Fine needle aspiration cytology (FNAC) is a simple, cost-effective and relatively non-invasive procedure and plays a pivotal role in the early detection of various lymph node pathologies.³

Aim Of The Study:

To study the spectrum of pathologies identified on Fine Needle Aspiration (FNA) of lymph nodes in a tertiary care hospital in North-East India and to determine its frequency with respect to age and sex distribution.

MATERIALS AND METHODS:

This is a retrospective study carried out in the Department of Pathology, AMCH during the period from March 2022 to February 2024, for a total period of 24 months. All the patients who presented in the Cytopathology section, including all age groups and both sexes with lymphadenopathy were included in the study.

FNAC was carried out under all aseptic and antiseptic conditions, using 22G needle attached to a 10ml syringe. The aspirated material was smeared onto a glass slide and air dried. Few slides were immediately fixed in 95% ethanol. Air dried smears were stained with May Grunwald-Giemsa stain whereas Ultra-PAP was used to stain the alcohol fixed smears. Whenever required, Ziehl Neelsen stain for AFB was carried out. The stained smears were examined by Cytopathologists and a diagnosis was made based on cytomorphological features, clinical presentation, and other relevant investigations.

Institutional clearance from Ethics committee (H) was obtained and Informed consent was taken.

RESULTS AND OBSERVATIONS:

Our study included 948 cases of lymphadenopathy who attended the Cytopathology section of Department of Pathology, AMCH. After analyzing the date of age gender and distribution, it was found that males were affected more than females, with M:F being 1.2:1.

Table – 1: Gender Distribution

MALE	FEMALE
522 (55%)	426(45%)

Table -2: Distribution of FNAC diagnosed cases

Cytological diagnosis	No. of cases	Percentage (%)
Tubercular lymphadenitis	292	30.80
Reactive lymphadenitis	248	26.16
Granulomatous lymphadenitis	131	13.81
Suppurative lymphadenitis	80	8.43
Metastatic lymphadenitis	150	15.82
Necrotic lymphadenitis	10	1.05
Chronic lymphadenitis	05	0.52
Hodgkin lymphoma	04	0.42
Non Hodgkin lymphoma	20	2.10
Lymphoproliferative neoplasm	02	0.21
Inconclusive	06	0.63

Out of the 948 total cases, 292(30.8%) cases were diagnosed as tubercular lymphadenitis, followed by reactive lymphadenitis (26.16%). 150 cases were metastatic lesions, while only 20 cases of non Hodgkin lymphoma were seen in this study.

Table -3: Age Distribution of Lymph Node lesions

AGE IN YEARS	0-10	11-20	21-30	30-40	41-50	>50
Tubercular lymphadenitis	20	113	103	26	18	12
Reactive lymphadenitis	31	88	63	23	18	25
Granulomatous lymphadenitis	14	38	32	16	13	18
Suppurative lymphadenitis	08	12	24	18	06	12
Metastatic lymphadenitis	00	01	06	13	58	72
Necrotic lymphadenitis	00	04	02	01	02	01
Chronic lymphadenitis	00	00	01	00	03	01
Hodgkin lymphoma	00	00	03	01	00	00

Non Hodgkin lymphoma	00	01	01	02	04	12
Lymphoproliferative neoplasm	00	00	02	00	00	00
Inconclusive	01	00	01	00	01	02

Of the 948 cases, tubercular lymphadenitis mostly affect the young age group ranging 20 to 30 years. Non specific reactive lymphadenitis is the most common finding in pediatric age group accounting for almost 35%.

Table – 4: Distribution of Lymph Nodes involved

Lymph nodes involved	No. of cases
Cervical	823
Axillary	78
Inguinal	20
Forearm/Arm	04
Supraclavicular	06
Preauricular	05
Post auricular	12

Table 4 shows the distribution of different lymph node groups involved. The cervical group of lymph nodes were involved most commonly (86.8%), followed by axillary (8.2%) and inguinal (2.1%)

Table – 5: Metastatic lesions on FNAC

Metastatic lesions	No. of cases
Squamous cell carcinoma	88
Adenocarcinoma	56
Occult primary	06

Of the metastatic lesions, Squamous cell carcinoma was the most common diagnosis (88out of 150 cases), followed by adenocarcinoma (56 out of 150 cases)

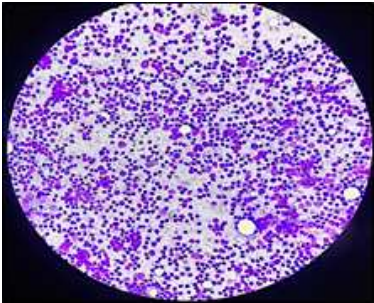


Figure-1 : FNAC smear showing reactive lymphadenitis composed of polymorphous population of lymphoid cells predominantly mature lymphocytes

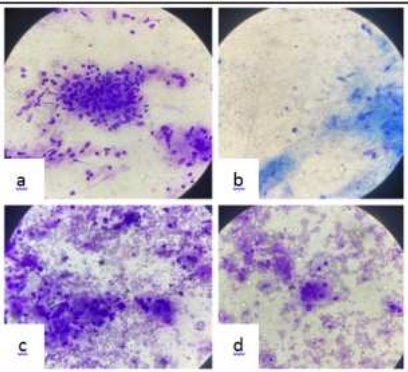


Figure-2 (a) FNAC smear of tuberculous lymphadenitis showing granuloma and epithelioid cells (b) Ziehl Neelsen stain demonstrating AFB (c) & (d) showing metastatic deposits to the lymph nodes

DISCUSSION:

In the present study, out of 948 cases, maximum cases were recorded between the age group of 11 years to 40 years which is comparable with the study done by Shafiulla et al4 and Nitin Chawla et al5 where maximum cases were recorded in the age group of 11-30 years.

Out of 151 patients, 522 (55%) cases were males and were females 426 (45%). The sex ratio in the present study was 1.2:1.09 (M:F), there is male preponderance. Similar observations were made by Haque and Talukder, and Steel et al.6

Tubercular lymphadenitis was the most common diagnosis in our study. Similar observations were made by Tirumalasetti and Latha,7 Agravat et al.,8 Jayaram and Chew9, Shenoy et al., and Deshmukh et al.10

Cervical lymph nodes were most commonly involved site, similar to study conducted by Shveta Narang et al.11 Among the neoplastic lesions, secondaries accounted for (150/948) 15.82% of cases and Hodgkin lymphoma and Non-Hodgkin lymphoma comprised 0.42% (4 cases) and 2.10% (20 cases) of cases, respectively. Similar observations were made by Jha B.C.et al, Jindal N et al, & Arora B et al.12

A study by Sadia Siddiq Nasser et al., showed that out of 110 cases study showed 110 cases, majority were tubercular (53.6%), followed by reactive (27.1%), suppurative (6.4%) lymphadenitis, lymphoma (4.5%), cystic lymphoid hyperplasia (2.8%), metastases (1.9%), cryptococcal lymphadenitis (0.9%). The age ranged from 6 to 70 years, majority falling in 4th and 5th decade, male preponderance was found (male-to-female ratio was 1.75: 1) and cervical lymph nodes were most commonly affected.12

CONCLUSIONS

Fine Needle Aspiration Cytology is an easy and rapid method for diagnosing the underlying pathology of superficial enlarged lymph nodes. Judicious application of FNAC in resource limited settings reduces the need of unwanted biopsies and can lead to very effective diagnosis with high sensitivity and specificity. Tubercular, reactive, and neoplastic conditions are the common causes leading to clinical lymphadenopathy in our study.

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