(International Print/Online Journal)

SJIF IMPACT FACTOR: 4.617
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume2, Issue 6, Page No: 384-392
November-December 2019

Study of fine-needle aspiration cytology of lymph node for the diagnosis of various diseases- 02 year study in our institute

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Paper Received: 05 December 2019
Paper Acceptance: 01 January 2020

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

ABSTRACT

Background -Fine needle aspiration cytology (FNAC) of the lymph node is a simple diagnostic tool to diagnose various diseases. Fine needle aspiration cytology (FNAC) is rapid, simple, reliable, minimally invasive, and cost effective procedure so it is used as the first line of investigation in diagnosing a variety of disease in outpatient setting. Lymphadenopathy is one of the most common clinical presentations of patients attending the outpatient department. **Aim and objectives:** To study the utility of FNAC in the diagnosis of various diseases etc. **Materials and Methods:** A prospective study of 350 cases of lymphadenopathy present in any region of body like cervical , supraclavicular, axillary , inguinal region etc presenting to the Department of Pathology in cytology section for 2 years from June 2017 to July 2019 was taken up for our study. **Results:** In our study most common lesion found was tubercular lymphadenitis, followed by granulomatous lymphadenitis, reactive hyperplasia etc and 22 cases of metastatic malignancy and 3 cases of lymphomas were diagnosed by FNAC of lymph nodes. Most common lymph node involved was cervical group of lymph node .**Conclusion:** FNAC of lymph nodes is a very useful, simple and sometimes the only tool in the diagnosis of various lymph node malignancies and non malignant conditions. **Keywords:** Fine needle aspiration cytology (FNAC), lymph node, lymphadenopathy, tubercular lymphadenitis, malignant and non malignant conditions..

Keywords: NIL.

INTRODUCTION

(FNAC) is a very simple and important diagnostic tool for lymph node lesions .Enlarged lymph nodes are easily accessible for fine needle aspiration and hence fine needle aspiration cytology for the diagnosis of various malignant and non malignant conditions .Malignancies in lymph nodes in our country are predominantly metastatic in nature with an incidence varying from 65.7% [1] to 80.4% [2] and lymphomas range from 2% [3] to 15.3% [2] among lymph nodes aspirated from all sites. Although gold standard in diagnosis of various malignant conditions is histopathology , FNAC maybe the only tool for diagnosis and further management of the patients in some cases of metastatic malignancy. Lymphadenopathy is one of the most common clinical presentations of patients attending the outpatient department. Thus, lymphadenopathy may be an incidental finding and/or primary or secondary manifestation of underlying diseases which may be malignant and non malignant [4] .Fine-needle aspiration cytology (FNAC) can be used in outpatient setting as it is rapid, simple, reliable, minimally

invasive, and cost-effective procedure so it is considered as the first line of investigation and assumed importance in diagnosing various diseases [5] .The etiology varies from an inflammatory process to a malignant condition. Tuberculosis is the most common cause of lymphadenopathy in developing countries such as India and should be considered in every case of granulomatous lymphadenopathy unless proved otherwise. FNAC has an important role in the evaluation of peripheral lymphadenopathy, and it can be used as a safe alternative to excision biopsy [6].

Aim and objectives: To study the utility of FNAC in the diagnosis of diseases like tubercular lymphadenitis, reactive hyperplasia, granulomatous lymphadenitis, acute suppurative lesion , suppurative granulomatous lesion, clinically suspected primary and secondary lymph node malignancy, etc .

MATERIALS AND METHODS Prospective study of 350 cases of lymph node swelling presenting to our Department of Pathology for 2 years from June 2017 to july 2019 was taken up for our study. A detailed history, clinical examination and relevant investigations were documented .After obtaining the Ethical Committee Clearance from our institution and informed consent from the patients, FNAC was performed using a 22–24-gauge needle and 10 ml syringe. Two smears were fixed in alcohol and then stained with hematoxylin and eosin and Papanicolaou stain. Two smears were air-dried, one was stained with Leishman stain and the other kept unstained to be used for Ziehl–Neelsen (ZN) staining whenever a cytological diagnosis of granulomatous disease was made and also in cases with abundant necrosis and suppuration. In cases where fluid was aspirated, the fluid was centrifuged and smears were made from the sediment, followed by the above staining methods. The criteria for the lymph node aspirates to be diagnosed as tubercular lymphadenitis included the presence of epithelioid cell granuloma and caseous necrosis with or without Langhans giant cells or ZN positivity. In cases where unsuspected metastasis was given, the primary site of malignancy was searched and sent for biopsy.

RESULTS AND OBSERVATION A total of 350 cases were obtained in the cytopathology section of our department over a period of 2 years from June 2017 to july 2019. Out of 350 cases, FNAC was inconclusive in 5 (1.4 %) cases due to unsatisfactory smears. Table 1 shows the cytological diagnosis in 350 patients with lymphadenopathy. Most common lesion found in our study was tubercular lymphadenitis [Figure 1a &1b] in 150 cases (42.8%), followed by granulomatous lymphadenitis [Figure 2] in 119 cases (34.0%), reactive hyperplasia[Figure 6] in 31 cases (8.8%), metastatic carcinoma in 22 cases (6.2%), acute suppurative lymphadenitis in 13 cases (3.7%), suppurative granulomatous in 7 cases (2.0%), non-Hodgkin's lymphoma in 2 cases (0.5%), and Hodgkin's lymphoma in 1 case (0.2%). The age and sex distribution of the patients with lymphadenopathy are shown in Tables 2 and 3. Age of the patients ranged from 0 to 90 years. The youngest patient was diagnosed as tubercular lymphadenitis having age 1.5 year male, and the oldest patient was diagnosed as having metastatic deposits in the lymph node from a squamous cell carcinoma having age 87 year male. Majority of the patients were in the age group of 11–50 years, with a peak (110 patients) in the age group 31–40 years. Metastatic deposits were more common in the elderly age group (greater than the fifth decade). Tubercular and granulomatous lymphadenopathies were more common in the 31-40 years of age . There were 145 male and 205 female patients. Table 4 shows the lymph node groups involved in various types of lymphadenopathy. It has been found that the most common lymph nodes involved in various types of lymphadenopathy were the cervical group.Tubercular lymphadenitis was the most common finding in our study. ZN stain [Figure 7] was done in all the cases of tubercular lymphadenitis and was positive in 41 cases out of 150 cases (27.33%). Majority 9 cases out of 22 metastatic carcinoma were from a squamous cell carcinoma [Figure 4], followed by Dutal carcinoma breast [Figure 3], adenocarcinoma and others. Metastatic deposits are also common in the cervical group 10 cases out of 22 metastatic carcinoma.

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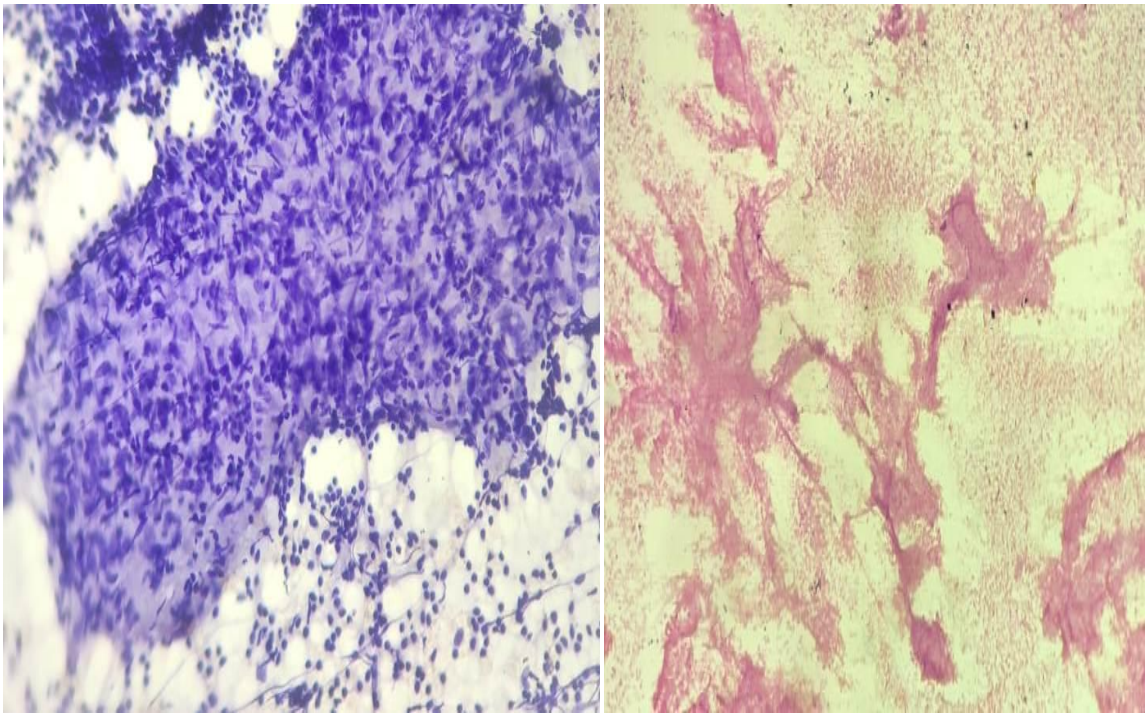

Figure 1a &1b -Tubercular lymphadenitis show presence of epithelioid cell granuloma and caseous necrosis respectively.

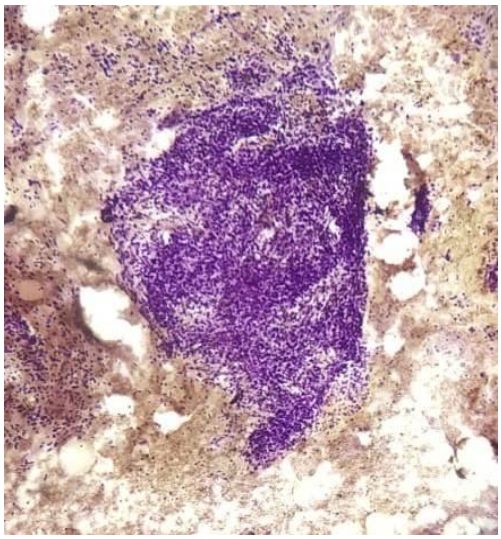

Figure 2- Granulomatous lymhadenitis

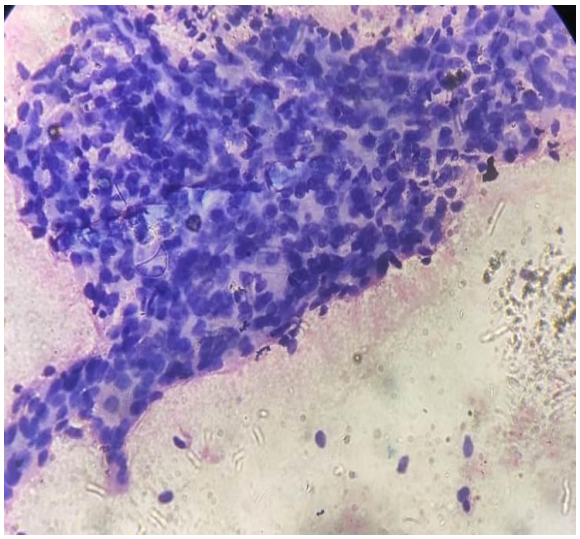

Figure 3- Ductal carcinoma breast

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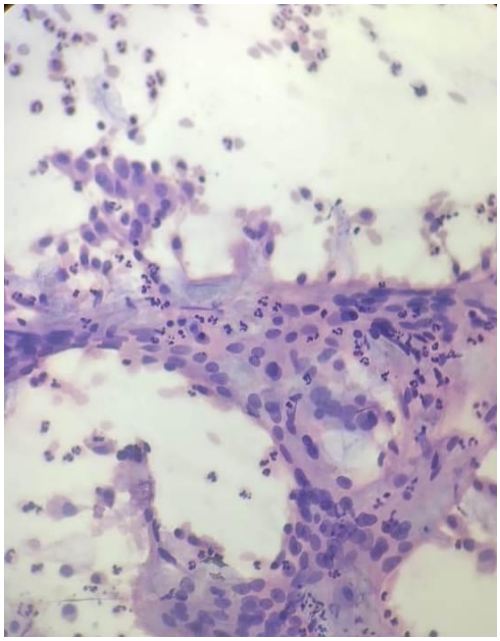

Figure 4 -Metastatic squamous cell carcinoma

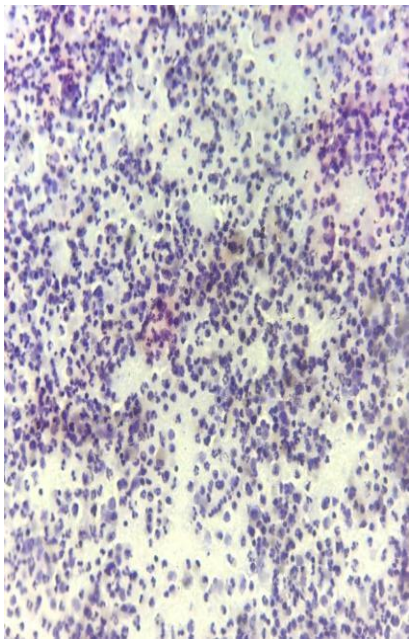

Figure 5-Acute suppurative

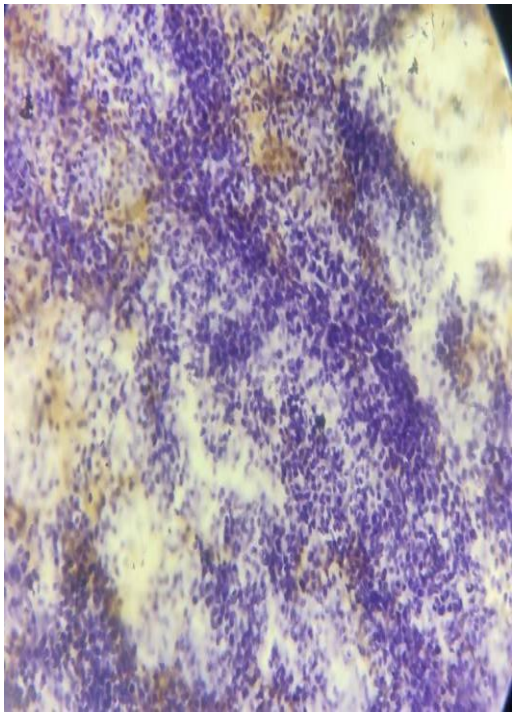

Figure 6 -Reactive hyperplasia

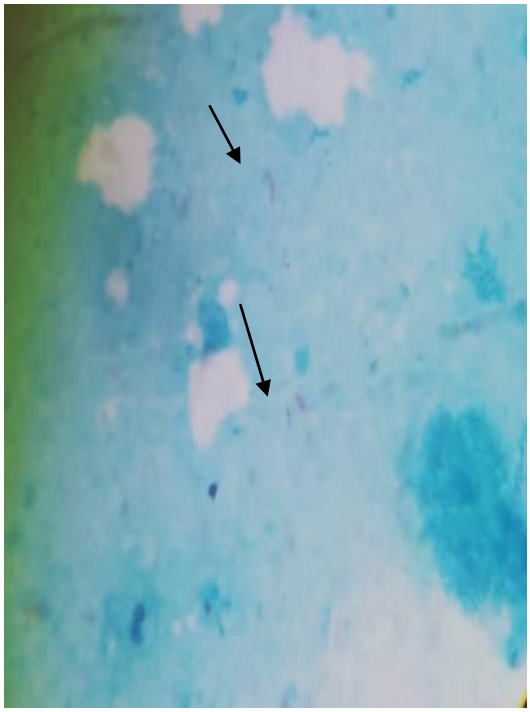

Figure 7 - ZN staining showing AFBs(black arrow)

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Table 1: Distribution of cytological diagnosis of 350 cases of lymph node swelling

Cytological diagnosis	Total Number of cases	percentage
Tubercular lymphadenitis	150	42.8%
Granulomatous lymphadenitis	119	34.0%
Reactive hyperplasia	31	8.8%
Metastatic carcinoma	22	6.2%
Acute suppurative	13	3.7%
Suppurative granulomatous	7	2.0%
Hodgkins lymphoma	1	0.2%
Non Hodgkins lymphoma	2	0.5%
Unsatisfactory	5	1.4%
Total	350	100%

Table 2: Age wise distribution Of patients of lymphdenopathy

Age in years	Tubercular lymphadinitis	Granulomatous lymphadinitis	Reactive Hyperplasia	Metastatic	Hodgkins lymphoma	Non Hodgkins lymphoma	Acute suppurative	Suppurative granulomatosis	Unsatisfactory
0-10	8	3	4	0	0	0	1	0	2
11-20	31	12	8	0	0	0	3	1	2
21-30	37	33	5	0	1	0	4	2	0
31-40	56	41	6	4	0	0	2	1	0
41-50	8	15	4	3	0	0	1	1	0
51-60	5	4	3	4	0	1	0	0	0
61-70	3	7	1	1	0	0	0	0	0
71-80	2	4	0	5	0	1	0	2	0
81-90	0	0	0	5	0	0	2	0	1
Total	150	119	31	22	1	2	13	7	5

Table 3: Sex wise distribution of patients of lymphdenopathy

Sex	Tubercular lymphadi	Granulomatous lymphadinitis	Reactive Hyperplasia	Metastatic	Hodgkins lymphoma	Non Hodgkins lymphoma	Acute suppurative	Suppurative granulomatosis	Unsatisfactory

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	nitis								
Male	62	34	17	15	1	1	8	4	3
Female	88	85	14	7	0	1	5	3	2
Total	150	119	31	22	1	2	13	7	5

Table 4: Lymph node group involved in various types of lymphdenopathy

Site	**Tubercular lymphadinitis**	**Granulomatous lymphadinitis**	**Reactive Hyperplasia**	**Metastatic**	**Hodgkins lymphoma**	**Non Hodgkins lymphoma**	**Acute suppurative**	**Suppurative granulomatosis**	**Unsatisfactory**
Cervical	123	89	15	10	1	1	5	3	2
Axillary	12	12	4	6	0	0	2	2	2
Supraclavicular	8	10	6	4	0	0	4	1	0
Inguinal	7	8	6	2	0	0	2	1	1
Generalised	0	0	0	0	0	1	0	0	0
Total	150	119	31	22	1	2	13	7	5

Table 5: Distribution of different type of metastatic tumour

metastatic tumour	cervical	Axillary	Supraclavicular	Inguinal	Gerneralised	Total
Squamous cell carcinoma	6	-	2	1	-	9
Ductal carcinoma breast	-	4	2	-	-	6
adenocarcinoma	1	-	-	1	-	2
Epithelial malignancy	1	-	-	-	-	1
Mucoepidermoid carcinoma	1	-	-	-	-	1
Thyroid carcinoma	1	-	-	-	-	1
melanoma	-	1	-	-	-	1
Round cell tumour – neuroblastoma	-	1	-	-	-	1
total	10	6	4	2	0	22

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Table 6: Distribution of different type of primary tumour

primary tumour	cervical	Axillary	Supraclavicular	Inguinal	Generalised	total
Hodgkin lymphoma	1	0	0	0	0	1
Non Hodgkin lymphoma	1	0	0	0	1	2

DISCUSSION

FNAC is a part of the initial management of patients presenting with any palpable mass as it is a simple, safe, cost-effective, and time saving procedure. Aspiration of lymph nodes for diagnostic purposes was first done by Griey and Gray in 1904, in patients with sleeping sickness[7] The experiment of fine needle aspiration (FNA) developed gradually, until 1921, when Guthrie tried to correlate FNA results with various disease processes[8] It was Dudgeon and Patrick in 1927, which first used FNAC in diagnosing tuberculous lymphadenitis [9] .Adequate material was obtained in 98.57% which correlated with the study by Hemalatha et al. (98%) and Gupta et al. (85.2%) [10,11] .In our study aspirates were inconclusive in 1.4% cases due to unsatisfactory smears ,aspirates were benign in 91.4% cases, metastatic deposits were found in 6.2 % and lymphomas in 0.85%. Similar findings were obtained by other authors [12,13,14] In our study, the majority of the patients were in the age group 21–40 years. This correlated with the study by Chandanwale et al., where maximum numbers of cases were seen in the age group of 21–40 years [15] Cervical lymph nodes were the most common group of lymph nodes involved in our study which was similar to that observed by Hirachand et al., Khajuria et al., and Chandanwale et al [15,16,17] Tuberculous lymphadenitis was the most common lesion and was reported in 150 cases (42.80%). This correlated with the study by Khajuria et al. (52.3%) [16] In our study, it was seen more frequently in the third to fourth decades of life with a female preponderance and cervical lymph nodes were most commonly involved, followed by axillary group. Similar observations were made in the study by Khajuria et al [16] ZN staining for AFB was positive in 41 cases ie 27.33% cases in our study. Ng et al. reported positivity in 41.6% cases and Ahmed et al. in 46% cases [18,19] .When multiplication of Bacilli in a lymph node is not under control, the lymph node becomes necrotic and turns into an abscess. Therefore, it is expected that the FNA from a tubercular abscess contains more AFBs (acid fast bacilli) than early tuberculosis lymph nodes [20] It appears that the chances of finding AFB are greater when pus or caseous material is aspirated while the aspiration of caseous material is almost always indicative of tuberculosis and merits an active search for AFB [21] The characteristic necrotic background comprising eosinophilic granular material containing nuclear debris was described as "tubercular diathesis." In developing countries where mycobacterial infection is prevalent and resources for medical care are limited, FNAC provides a simple, efficient, and cost effective alternative to diagnose tuberculous lymphadenopathy [20] .In a region where tuberculous infection is common and other granulomatous diseases are rare, the presence of a granulomatous feature in FNAC is highly suggestive of tuberculosis. The literature on the use of FNAC to diagnose tuberculous cervical lesions is mainly from the developing countries where mycobacterial infections are prevalent [20] Lymph node aspirates in 22 cases (6.2%) showed metastatic deposits. This is in correlation with the studies by Patel et al. and Ghartimagar et al. where metastatic deposits were seen in 27.06% and 18% cases [22,23] Most of the metastatic deposits 9 out of 22 metastatic cases (40.9%) were from squamous cell carcinoma and our findings correlated with the studies by Hemalatha et al. (60%) and Patel et al. (75.5%) [10,22] The high incidence of squamous cell carcinomas in our study can be attributed to the high incidence of tobacco chewing and head and neck cancers in our region. Lymphomas constituted only 0.8% cases 3 cases out of 350 cases in our study. This was in accordance with the study by Khan et al. (2%) [24] Although their prevalence is low, they pose a great diagnostic challenge.

Conclusion FNAC of lymph nodes is a very useful and simple tool in the diagnosis of lymph node malignancies and other non malignant conditions . It may be the only tool in the diagnosis of metastatic

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lesions in the lymph nodes and can help to detect occult primary malignancies .It is quick, safe, minimally invasive, and reliable and is readily accepted by the patient. The excellent first line investigation to determine the nature of lesion in lymph nodes is FNAC. It is an economical and convenient alternative to open biopsy of lymph nodes. Our study highlighted the various cytomorphological patterns of lymphadenopathy and revealed diagnosis of various diseases. Hence, the cytopathologist plays a vital role in the diagnosis of lymph node malignancies and other non malignant conditions.

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