



ROLE OF FNAC IN THE DIAGNOSIS OF LYMPHADENOPATHY: AN INSTITUTIONAL EXPERIENCE.

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ABSTRACT

INTRODUCTION: Lymphadenopathy is one of the most common presentation of the patients attending the outpatient department. The underlying etiology can be infective or neoplastic and its diagnosis can help the clinician to plan the treatment strategy. Fine needle aspiration cytology (FNAC) is used as the first line investigation due to its simplicity and ease. **AIM:** The aim of the study was to find out the spectrum of lymph node lesions encountered on FNAC in a tertiary care hospital of the Sub Himalayan region. **MATERIAL AND METHOD:** One year data from January 2020 to December 2020 was retrieved from the records of cytology lab of the Department of Pathology IGMC Shimla. All the FNACs received and performed in the Department of Pathology were included in the study. **RESULT:** Of the total 668 cases, most of the cases were in the age group of 21-30 years (22.4%) and there was slight female preponderance (359 cases; 53.8%). Cervical lymph node was the most common node involved in 449 cases (67.3%). Chronic non specific lymphadenitis (233 cases, 34.8%) was the most common lesion found in our study, followed by granulomatous lymphadenitis with and without caseous necrosis (203 cases, 30.5%). In this category of granulomatous lymphadenitis, AFB positivity was seen in 59 (29.0%) cases of the total 203 cases. Metastatic carcinoma and lymphoproliferative disorder were seen in 165 (24.7%) and 24 (3.7%) cases respectively. **CONCLUSION:** Apart from being a simple, easy, quick, relative painless, minimally invasive and an OPD procedure, FNAC was found to be a reliable and cost effective first line investigation for work up of the patients presenting with lymphadenopathy.

KEYWORDS : Lymphadenopathy, FNAC

INTRODUCTION:

Lymphadenopathy, defined as the enlargement of lymph nodes, is a common clinical presentation with variable etiologies.¹ Enlarged superficial lymph nodes are easily accessible and can be evaluated using FNA technique.² The abdominal lymph nodes can be aspirated under radiological guidance. Fine needle aspiration technique was introduced by Greig and Grey.³ It has been used as a diagnostic tool for the evaluation of superficial lesions since 1960. This technique is cost effective with a rapid turnaround time, relatively less traumatic and reliable.⁴ The cytomorphologic diagnosis corroborate well with histological diagnosis, which is more specific and accurate. However HPE is relatively more expensive and time consuming.⁵ Hence FNAC is preferred as first line investigation for quick preliminary diagnosis.⁶ This study was undertaken to study the spectrum of lesions obtained on evaluation of lymphadenopathy in our tertiary care hospital, IGMC Shimla.

MATERIAL AND METHODS:

One year data (1st January 2020 to 31st December 2020) was retrieved from the records of cytology lab in the Department of Pathology, Indira Gandhi Medical College, Shimla. All the FNACs performed on superficial lymph nodes and USG/CT guided FNACs done in deep seated lymph nodes in collaboration with the Department of Radiology were included in the study. Most of the patients were referred from surgery, medicine, ENT, pediatrics and occasionally from dermatology department. Consent of the patients was obtained in every case. The clinical profile of each patient including relevant investigations were noted. FNAC was done using 22-24 gauge needle and 20cc syringe fitted to the Franzen handle. Smears were air dried, fixed in 95% methanol and Giemsa staining was done. Ziehl-Neelsen staining and PAS staining was done wherever required. The results were recorded and analyzed with respect to the demographic details, site of lesion and diagnosis.

RESULTS:

During one year, a total of 2245 FNACs were performed and received in the Department of Pathology. Out of these, 668 (27.5%) cases were from various lymph nodes. In our study cohort, 309 (46.7%) patients were males and 359 (53.8%) were females. Slight female preponderance was noted with the male to female ratio of 1:1.1.

The age of the patients ranged from 3 months to 96 years with majority of cases (22.4%) in the age group of 21 to 30 years. (Table: 1)

Table 1: Age and gender wise distribution of cases.

Age group	Males	Females	Total
0-10	29	15	44 (6.7%)
11-20	31	27	58 (8.7%)
21-30	53	97	150 (22.4%)
31-40	33	70	103 (15.4%)
41-50	35	49	84 (12.6%)
51-60	49	39	88 (13.1%)
61-70	42	42	84 (12.6%)
71-80	30	17	47 (7.0%)
81-90	6	3	9 (1.4%)
Above 90	1	0	1 (0.1%)
	309 (46.2%)	359 (53.8%)	668 (100%)

The data was assessed for the site of lymphadenopathy. It was observed that in 449 (67.3%) cases, the cervical lymph node was involved followed by the involvement of supraclavicular lymph node in 103 (15.4%) cases. (Table. 2).

Table 2: Site of lymph node involvement

Region	Total	Male (%)	Female (%)
Cervical	449 (67.3%)	208 (67.3%)	241 (67.1%)
Supraclavicular	103 (15.4%)	48 (15.6%)	55 (5.3%)
Axillary	52 (7.8%)	18 (5.8%)	34 (9.5%)
Inguinal	35 (5.2%)	21 (6.8%)	14 (3.9%)
Submandibular	12 (1.8%)	4 (1.3%)	8 (2.3%)
Abdominal	11 (1.6%)	7 (2.3%)	4 (1.1%)
Mesenteric	6 (0.9%)	3 (0.9%)	3 (0.8%)
Total	668 (100%)	309 (100%)	359 (100%)

Majority of the lesions were non neoplastic (65.8%) and in 189 (28.4%) cases neoplastic lesions were found. In 38 cases (5.6%) the reports were in conclusive due to scant material or poor preservation of cells.

Chronic non specific lymphadenitis was the most common entity diagnosed in 233 (34.8%) cases followed by granulomatous lymphadenitis in 203 (30.3%) cases. One hundred and sixty five (24.7%) cases were diagnosed with metastatic deposits and lymphoproliferative disorders were seen in 24 (3.8%) cases. (Table 3)

Table 3: Cytological diagnosis of lymph node aspirates

Diagnosis	Males	Females	Total %
Chronic non specific lymphadenitis	99 (32.0%)	134(37.3%)	233(34.8%)
Granulomatous lymphadenitis	86 (27.8%)	117 (32.6%)	203(30.3%)
Metastatic deposits	101 (32.7%)	64(17.8%)	165 (24.7%)
Descriptive report / Scant material	12 (3.9%)	26 (7.3%)	38(5.6%)
Lymphoproliferative disorders	10 (3.3%)	14 (3.9%)	24(3.8%)
Acute suppurative	1 (0.3%)	4 (1.1%)	5 (1.4%)
Total	309(100%)	359(100%)	668(100%)

Granulomatous lymphadenitis included all cases revealing epithelioid cell granulomas, langhans giant cell with or without caseous necrosis. ZN staining was done in all cases and found positive in 59 out of 203 (29.0%) cases.

Of the 165 cases of metastatic deposits, squamous cell carcinoma was seen in 62 cases (37.6%), adenocarcinoma in 41 cases (24.8%), poorly differentiated carcinoma in 39 cases (23.7%) and small cell carcinoma in 13 cases (7.9%). Cytological features were of duct cell carcinoma in 6 (3.6%) cases followed by papillary carcinoma in 4 cases (2.4%). Higher frequency of metastatic deposits was observed in males in comparison to female patients. (Table. 4)

Table. 4: Pattern of metastatic deposits

S no	Metastatic lesion	Males	Females	Total (%)
1	Squamous cell carcinoma	46	16	61(37.6%)
2	Adenocarcinoma	22	19	41(24.8%)
3	Poorly differentiated carcinoma	23	16	39(23.7%)
4	Small cell carcinoma	7	6	13(7.9%)
5	Duct cell carcinoma	2	4	6(3.6%)
6	Papillary carcinoma	1	3	4(2.4%)
	Total	101(61.1%)	64(38.9%)	165(100%)

Lymphoproliferative disorders were diagnosed in 24 cases. Cases of non Hodgkin lymphoma (n=20) outnumbered Hodgkin s disease (n=4).

Table 5: Lymphoproliferative disorders.

S. no	Lesion	Males	Females	Total
1.	Non Hodgkin lymphoma	9	11	20
2.	Hodgkin lymphoma	1	3	4

DISCUSSION:

Any infective, non neoplastic or neoplastic condition can present with the enlargement of draining lymph node.⁷ FNAC is one of the first line investigation to rule out malignancy and come to a definite diagnosis.⁸ FNAC is simple, quick, minimally invasive, relatively painless and can provide reliable results if done by an expert in the field.^{3,9} In majority of the cases, it saves the patient from unnecessary trauma associated with excision biopsy and hospital stay since it can be done as an OPD procedure. It is also cost effective.^{3,9} However, it is not a substitute for excision biopsy specially in cases of lymphoma where the architecture of the lymph node is important for diagnosis.^{9,10}

Majority of the patients in our study were in the age group of 21 to 30 years (22.4%). This is in concurrence with the findings of Gulhane S et al (27.4%),¹¹ Shrivastava J P et al (25.2%)¹² and Gayathri M et al (20.2%).¹³ In our study, of the total 668 cases, 359 (53.8%) cases were females and 309 (46.2%) cases were males. So a mild female preponderance (53.8%) was noted similar to Duraiswani R et al (61%)¹⁴ and Badge S et al (62.3%)¹⁵. Biradar S et al (51.2%)¹⁶, Shrivastava J P et al (52.1%)¹² and Gayathri M et al (51.4%)¹³ had however observed male preponderance.

Cervical lymph node was the most common lymph node involved in

67.3% cases which is concordant with the findings of Mishra et al (70.4%),¹⁷ Badge et al (77.0%)¹⁵ and Biradar S et al (69.3%).¹⁶

Four hundred and thirty six cases (67.2%) were benign or infective lesions while 189 cases (28.2%) revealed a neoplastic pathology. Biradar et al,¹⁶ Malhotra A et al¹⁸ and Shrivastava J P et al¹² had found higher percentage of benign lesions, 90.6%, 86.3% and 82.6% respectively. This discordance could be due the fact patients in our study cohort were referred for work up relatively late since ours is a tertiary care hospital of the state.

Lymph nodes react to anything stimulating the immune system hence benign reactive lymphadenopathy is common. Reactive lymphadenitis leads to reversible enlargement of lymphoid tissue in response to a variety of pathological processes. It comprises of follicular hyperplasia, paracortical hyperplasia, sinus histiocytosis or a mixed pattern.¹⁹ Cytological smears reveal polymorphous lymphoid aspirate with predominance of small mature lymphocytes along with tingible body macrophages.¹⁹

Frequency of chronic non specific lymph adenitis varies widely in different studies (18.9% to 42%).²⁰⁻²⁵ In our study, chronic non specific lymphadenitis was the most common lesion seen in 233 (34.8%) cases. Similar findings were observed by Mishra et al (25.8%),¹⁷ Gayathri et al (26.2%)¹³ and Shrivastava J et al (32.0%)¹². Duraiswani R et al¹⁴, Biradar S et al¹⁶ and Malhotra et al¹⁸ had found 49.8%, 55.6%, 42.6% cases of chronic non specific lymphadenitis respectively, higher in comparison to our study.

Granulomatous lymphadenitis is a distinct pattern of immune response characterized by organized collections of epithelioid macrophages to form granulomas.¹⁵ Other findings include presence of necrosis & type of giant cells (langhans /foreign body type).²² Tuberculosis is the most common cause of granulomatous lymphadenitis.¹⁵ In our country, where T.B. is endemic, granulomatous lymphadenitis is treated as tubercular unless proved otherwise.^{15,22}

Granulomatous lymphadenitis was seen in 30.3% cases which is similar to the observations of Badge S et al (32.9%)¹⁵ and Duraiswani R et al (37.1%)¹⁴. A wide variation in the frequency of granulomatous lymphadenitis was observed in various studies ranging from 3.75 % (Biradari et al) to 37.1% (Duraswani R et al).^{16,14} This discrepancy in frequency of granulomatous lymphadenitis in various studies could be due to fact that some of the authors have excluded tubercular lymphadenitis from granulomatous lymphadenitis based on presence of caseous necrosis (with /without ZN positivity).^{8,13,16} On the other hand some authors have clubbed all these under common category of granulomatous lymphadenitis¹⁴.

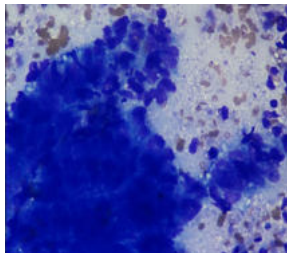
Ziehl Neelson staining done for AFB was positive in 59 (29.0%) cases out of the 203 cases of granulomatous lymphadenitis very much similar to the observation of Biradar et al.¹⁶

Lymph nodes are common site of metastatic disease.²⁶ Presence of metastasis is important for TMN staging. Type of metastatic lesion and the site of lymph node involved can help find the primary in cases with unknown primary, for example upper cervical lymph nodes are associated with lesion in the upper aerodigestive tract.²⁷

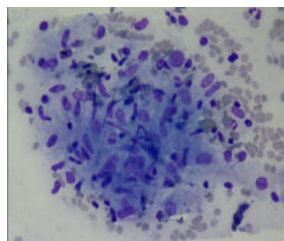
Metastatic deposits were seen in the 165(24.7%) cases similar to the observations made by Gayathri M et al¹³ (21.2%), Mishra et al¹⁷ (19.6%), Shrivastava J et al¹² (17.0%), Patel et al²⁸ (27.0%) & Ghartimagar et al²⁹ (18.0%). Bhaskaran et al³⁰, Duraiswani R et al¹⁴, Badge S et al¹⁵ had found lesser number of metastatic deposits, 4.8%, 4.3% and 3.8% respectively. Izhar et al³¹ (65.7%), Alam K et al³² (80.4%) and Qadri S et al³³ (38.2%) had observed higher number of cases in comparison to our observation. Squamous cell carcinoma was the most common metastatic tumour in our study concurrent with Mishra et al¹⁷, Patel et al²⁸ and Shrivastava J et al¹². Malhotra et al¹⁸ however found metastatic adenocarcinoma as the most common type.

Lymphoproliferative disorders were seen in 24 (3.7%) cases only. Khajur et al²⁰ (2.0%), Mishra et al¹⁸ (2.7%), Bhaskar et al³⁰ (2.9%) and Malhotra et al¹⁸ (4.7%) had similar observations. Gayathri M et al¹³, Shrivastava J et al¹² and Durasawini R et al¹⁴ found less cases in comparison to our study 0.73%, 1.0% and 1.6% respectively. Cases of NHL were about 80% of the total lymph proliferative disorders very similar to the observations made by Malhotra et al¹⁸ (63.7%), Duraswami et al¹⁴ (75%) and Shrivastava J et al¹² (75%).

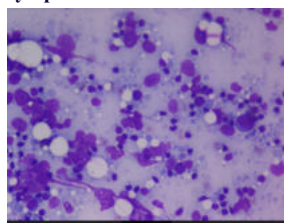
In our study, out of the 668 lymph node aspirates, in 38 cases (5.6%) we were not able to provide a definite diagnosis due to insufficient material or poor preservation which is close to the findings of Chawla et al³⁴ (3.3%) and Biradar S et al¹⁶ (3.1%). Badge et al¹⁵ and Shrivastava J P et al¹² reported very negligible cases in this category (1.6% & 0.4% respectively). Qadri et al³³ reported 12.0% cases with unsatisfactory material. This can be addressed by repeating the FNA after taking the patient into confidence and with proper counselling.



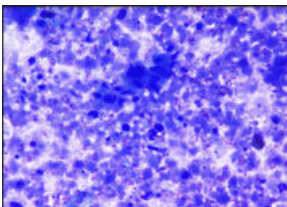
Metastatic adenocarcinoma



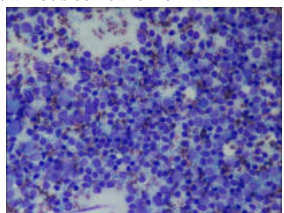
Granuloma tous lymphadenitis



NHL



Keratinizing squamous cell carcinoma



Non specific reactive hyperplasia

CONCLUSION :

Thus FNAC has proved to be a simple, reliable and a rapid first line investigative tool for the work up of lymph node enlargement. It is easily acceptable to the patient because it is relatively painless no associated scar. Since, it can be done as an OPD procedure, it has proved to be cost effective as it is not associated with the loss of daily wages. It is very effective in screening and follow up especially in cases of malignant etiology.

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