

A Cytological Study of Pattern of Lymph Node Lesions at Tertiary Care Centre in Uttar Pradesh

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ABSTRACT

Background: Fine Needle Aspiration Cytology (FNAC) is a simple, rapid, cost effective and reliable technique which can be used as a routine outpatient department (OPD) procedure and first line of investigation in diagnosing a variety of superficial and deep lesions. Lymphadenopathy is of great clinical significance and the underlying cause may range from a treatable infectious etiology to malignant neoplasms. In this study, we describe the diagnostic utility of FNAC in the assessment of lymph node lesions with an emphasis on the diagnosis of non-neoplastic, benign, malignant neoplastic and tuberculous.

Methods: This was a retrospective study done over a period of four years. A total of 920 patients including all age groups and both sexes presenting with palpable or deep lymph nodes in FNAC clinic of our institute were included in our study. FNAC was conducted with 22-24 Gauge disposable needles attached to 10c.c syringes. Smears were fixed in 95% ethyl alcohol and stained with Papanicolaou stain. Leishman stain was done on air dried smears. Ziehl- Neelsen (ZN) staining was done wherever required.

Results: Out of 920 FNAC from lymph nodes, the most frequent cause of lymphadenopathy was found to be Tuberculosis with 466 cases (50.65%). The next frequent diagnosis was reactive lymphadenitis with 317 cases (34.45%) followed by metastatic lymphadenopathy in 50 cases (5.43%) and acute suppurative lymphadenitis in 46 cases (5%). A diagnosis of lymphoproliferative disorder was rendered in 27 cases (2.93%). In 14 cases (1.52%) FNAC was inconclusive.

Conclusion: In our study, the predominant cause of lymphadenopathy was tuberculous lymphadenitis, seen in more than half of total cases, followed by reactive, acute suppurative lymphadenopathy and malignant neoplasms. FNAC was helpful in establishing the diagnosis in 98.48% of the cases.

Keywords: FNAC, Lymphadenopathy, Tuberculous lymphadenitis, Metastatic lymphadenitis

INTRODUCTION

Lymphadenopathy refers to the nodes which are abnormal in size, consistency and number. [1] It is one of the commonest clinical presentations of patients attending the Out Patient Department. The degree and pattern of morphological changes are dependent on the inciting stimulus and the intensity of the response. Thus lymphadenopathy may be an

incidental finding and/ or primary or secondary manifestation of underlying diseases which may be neoplastic or non-neoplastic. [2] FNAC as first line of investigation has assumed importance in diagnosing a variety of disease processes as it is rapid, simple, reliable, minimally invasive and cost effective procedure which can be used in outpatient setting. [3] FNAC has an important role in the evaluation of

peripheral lymphadenopathy and it can be used as a safe alternative to excision biopsy. [4] In developing countries, almost two third of the cases are due to tuberculosis. Tuberculous lymphadenopathy is the commonest form of extrapulmonary tuberculosis. [5] Our experience of the diagnostic utility of FNAC in the assessment of lymphadenopathy is presented in this study. The study highlights the epidemiological patterns and cytomorphological spectrum of lymph node lesions in this region. The study also emphasises on cytological spectrum in diagnosis of pattern of tuberculosis; also providing details about burden of disease in this region.

METHODS

This study was a retrospective review of FNAC of lymph node lesions between Oct. 2015 to Sept. 2019. Data was retrieved from the records of the Department of Pathology, KDMCHRC, Akbarpur, Mathura, Uttar Pradesh, India. 920 cases were included in the study. FNAC had been performed using 22-24 Gauge needles attached to 10 ml syringes. One to two passes were given and the aspirated material was smeared onto glass slides. Smears were fixed in 95% ethyl alcohol and stained with Papanicolaou stain. Leishman stain was done on air dried smears. Ziehl-Neelsen (ZN) staining was done whenever a cytological diagnosis of granulomatous disease was made and also in cases with abundant necrosis and suppuration. In cases where fluid was aspirated on FNAC, the fluid was centrifuged and smears were made from the sediment followed by the above staining methods. The cytological diagnosis for each case was based on cytomorphology and available clinical information. The diagnoses were categorized broadly as tuberculous lymphadenitis, Reactive lymphadenitis, acute suppurative lymphadenopathy, metastatic lymphadenopathy and lymphomas. The tuberculous lymphadenitis cases were further divided into three groups on the

basis of cytomorphological analysis: group 1 - Granulomas without necrosis, group 2 - Caseating epithelioid granuloma and group 3 - Necrotizing lymphadenitis. In those cases where lymphoma or leukemic infiltration of lymph nodes was suspected on cytology, bone marrow aspiration and other necessary haematological investigations were done. Data was entered in excel spread sheet and statistical analysis was done using epidemiological information package. Kruskal-Wallis Chi square test was used. P value <0.05 was taken to represent significant difference.

RESULTS

A total number of 920 FNACs were studied. The patients ranged from 21days to 80 years in age with the male to female ratio of 0.89:1. Out of 920 cases, maximum numbers of cases were recorded in the age group 10-19 years (Table 3). The youngest patient had acute suppurative lymphadenopathy whereas the oldest patient had Non-Hodgkin's lymphoma. Cervical lymph nodes were enlarged in 739 out of 920 cases (80.32%) followed by axillary lymph nodes in 106 cases (11.52%), inguinal lymph nodes in 36 cases (3.91%), supraclavicular lymphnodes in 29 cases (3.15%), and mesenteric in one case (0.10%). Multiple sites were involved in 9 cases (0.98%) (Table 1). The size of the lymph nodes varied from 0.5cm to 5cm. The lymph nodes in tuberculosis were multiple, soft to firm and matted; while they were discrete in reactive lymphadenitis and firm to hard and fixed in majority of metastatic lesions. Tuberculous lymphadenitis was the most frequent diagnosis with 466 cases (50.65%) (Table 2). The tuberculous lymphadenitis cases were further divided into three groups on the basis of cytomorphological analysis; group1: Granulomas without necrosis – 126/466 (27.03%), group 2: Caseating epithelioid granuloma – 320/466 (31.08%) and group 3: Necrotizing lymphadenitis – 20/466 (4.29%). Acid fast bacilli positivity on ZN staining was seen in 128 out of 466 cases

(22.67%) of tuberculous lymphadenitis. Next frequent diagnosis was reactive lymphadenitis with 317 out of 920 cases (34.45%). Malignant lymph node lesions were seen in 77 out of 920 cases (8.37%). These comprised of metastatic lymphadenopathy 50/920 (5.43%), malignant lymphomas 27/920 (2.93%) and one case of myeloproliferative lesion in lymph node 1/920 (0.10%). Metastatic lesions were more common in cervical lymph nodes. Out of 27 cases of lymphoma, 22 were Non- Hodgkin's lymphoma and 5 were Hodgkin's lymphoma. Acute suppurative lymphadenopathy was seen in

46 out of 920 cases (5%). In 14 cases (1.52%), the aspirate was inadequate for a definite diagnosis.

Table 1: Site of lymphnode involvement (n=920)

Sites of lymphnode involvement (n=920)	
Cervical	739 (80.32%)
Axillary	106 (11.52%)
Supraclavicular	29 (3.15%)
Inguinal	36 (3.91%)
Mesenteric	1 (0.10%)
Multiple	9 (9.80%)
Total	920

Table 2: Cytological diagnosis of 920 cases.

Cytological diagnosis	Number of cases	Percentage
Tuberculous lymphadenitis	466	50.65%
Reactive lymphadenitis	317	34.45%
Acute suppurative lymphadenitis	46	5%
Metastatic lymphadenopathy	50	5.43%
Malignant lymphoma	27	2.93%
Myeloproliferative disorder	1	0.10%
Inadequate	14	1.52%

Table 3: Age and Sex distribution of lymphadenopathy.

Age (year)	Tubercular	Reactive	Acute Suppurative	Metastatic	Malignant	Inadequate	Total
	M F	M F	M F	M F	M F	M F	M+F= Total
0-9	28 28	52 34	5 5	0 0	1 1	1 0	87+68= 155
10-19	52 97	63 52	7 12	0 0	2 1	2 3	126+165=291
20-29	67 83	26 38	1 3	1 3	2 2	2 3	99+132= 231
30-39	23 39	13 17	2 2	5 5	2 1	1 0	46+64= 110
40-49	11 16	8 9	1 2	4 0	3 1	1 0	28+28= 56
50-59	6 5	2 3	1 1	10 2	2 2	1 0	22+13= 35
60-69	3 5	0 0	1 3	13 2	1 0	0 0	18+10= 28
70-79	2 0	0 0	0 0	2 3	3 2	0 0	7+5= 12
80-89	0 1	0 0	0 0	0 0	1 0	0 0	1+1= 2
Total	192 274	164 153	18 28	35 15	17 10	8 6	434+486=920

Table 4: Various cytomorphological pattern of tuberculous lymphadenopathy

Cytomorphological picture	No. of cases	AFB positive Cases	P value
Granuloma without necrosis	126 (27.03%)	11 (8.73%)	<0.001* Highly significant
Caseating Granuloma	320 (68.66%)	102 (31.87%)	
Necrotising Lymphadenitis	20 (4.29%)	15 (75%)	
Total	466	128(27.46%)	

*Chi square test was applied.

DISCUSSION

FNAC is an important diagnostic tool to aid in the diagnosis of lymph node lesions. It is inexpensive, safe and quick and reduces the need for surgical biopsy. [6] Aspiration of lymph nodes was first done by Griey and Gray in 1904, in a patient with sleeping sickness. [7] It was Dudgeon and Patrick in 1927, who first used FNAC in diagnosis of tuberculous lymphadenitis. [8] In the present study, an attempt has been made to study the cytomorphological spectrum and epidemiological pattern of lymph node lesions. In this study, maximum

numbers of cases were recorded in the age group 10-19 years. While the maximum number of cases in other studies were recorded in age group 21-30 years. [3,9-12] Cervical lymph nodes were the most common group of lymph nodes involved, which is similar to that observed by Pavithra et al, [3] Chandanwale et al., [12] Kochhar et al. [13] and Mohanty et al. [14] Tuberculous lymphadenitis was the most common lesion and was reported in 50.65% cases and maximum number of these cases were in the age group 10-19 years with a female preponderance (M:F = 0.70:1) followed by

20-29 years and 0-9 years. The difference was found to be statistically significant (Table 4). A declining trend was noted in incidence of tubercular lymphadenitis after 30 years of age, which was in concordance with that observed by Ahmed et al. [15] It may be due to the development of immunity in older patients. The female preponderance of tuberculous lymphadenitis has been observed by Pavithra et al., [3] Fatima et al [6] and Chand et al. [16] This may be because of malnutrition and overall low living standards among females in this area. Cervical lymph nodes (80.32%) were more commonly involved by tuberculosis, followed by axillary group (11.52%) in our study. Similar observations were made by Pavithra et al., [3] Chand et al. [16] and Khajuria et al. [17] and Das et al. [18] ZN staining for acid fast bacilli was seen in 27.46% cases (Table 4) in our study, while Chand et al. [16] reported 44.54% cases, Bezabih et al. [19] reported 59.5% cases, Paliwal et al. [20] reported 71% cases. On the other hand, a very low positivity rate of AFB (19.6% cases) on ZN Staining was reported by Aggarwal et al. [21] in their study. Low incidence of AFB positivity in our study may be due to combined maximum percentage (95.7%) 446 of cases having epithelioid cell granulomas with necrosis and cases with epithelioid cell granulomas without necrosis unlike series of Paliwal et al. [20] where these groups together accounted for only 30.7%. In our study, necrosis alone was seen in 20(4.29%) cases and 15 (75%) of these were positive for acid fast bacilli. It has been observed that the foci of necrosis are associated with marked proliferation of tubercle bacilli whereas lymphocytes, epithelioid cells and multinucleated giant cells have a role in limiting the proliferation of AFB. [18,22] Therefore, it is expected that FNAC from a tuberculous abscess yields more AFBs than early tuberculous lymphnodes. [23] The characteristic necrotic background comprising of eosinophilic granular material containing nuclear debris was described as 'tubercular diathesis'. Those cases lacking

the typical finding and showing scattered epithelioid cells with or without granulomas or only necrotic material with neutrophilic infiltration were diagnosed as tuberculous lymphadenitis when this tubercular diathesis was found cytologically, even though AFB were absent in these smears. [24] Granulomas can be seen in a variety of other conditions causing lymphadenopathy including sarcoidosis, carcinoma, lymphoma, fungal diseases, cat scratch disease, collagen vascular disease and disease of the reticuloendothelial system. [25] But, 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. [23] In our study, the commonest cause of lymphadenopathy in pediatric age group males was reactive lymphadenitis whereas it was Tuberculous lymphadenitis in Pediatric age group females. This trend underscores the poor nutritional status of females in this region. Reactive lymphadenitis was seen in 34.45% cases which is comparable to study by Khan et al. [26] (28%). Whereas, in other studies reactive lymphadenitis was the most frequent diagnosis and its incidence ranged from 18.9% to 42%. [13,14,17,27,28] Acute suppurative lymphadenopathy was observed in 5% cases in our study which is comparable with the study done by other workers, Patra et al [29] (5.8%) and Kochhar et al. (4%). [13] Lymph node aspirates in 5.43% 77 cases showed metastatic deposits and males outnumbered females in these cases, (M: F= 2.33: 1). Maximum cases were seen in age groups 50-69 years and predominant deposits were of squamous cell carcinoma. This correlates with findings of studies by Pavithra et al [3] (56.25%). The high incidence of squamous cell carcinoma may be due to the high incidence of smoking and tobacco chewing in this area. Malignant lymphoma constituted 2.93% (27 cases) of all cases in our study, which is comparable with the observations made by Fatima et al. [6] (5.2%), and Hirachand et al. [27] (6.1%). In the present study, Non-

Hodgkin's Lymphoma (NHL) and Hodgkin's Lymphoma (HL) constituted 2.31% and 0.41% respectively. This is comparable to study by Bhaskaran et al. [30] in which NHL and HL constituted 2.23% and 0.74% respectively. Patra et al. [29] in his study reported NHL and HL as 4.8% and 1.01% respectively. However, Hafez et al. [31] reported that cases suspicious for NHL were 32.5% and were the prominent cause of cervical lymphadenopathy. Aspirates were inconclusive in 1.52% 14 cases due to unsatisfactory smears. The causes of unsatisfactory smears were scant cellular yield or hemodiluted smears.

CONCLUSION

FNAC of lymph nodes is an excellent first line investigation to determine the nature of lesion. It is quick, safe, minimally invasive, reliable and is readily accepted by the patient. Our study highlighted the various cytomorphological patterns of lymphadenopathy and revealed a huge burden of tuberculous lymphadenitis in this region.

REFERENCES

1. Darnal HK, Karim N, Kamini K, Angela K. The Profile of lymphadenopathy in adults and children. *Med J Malaysia*. 2005;60:590-8.
2. Pandit AA, Candes FP, Khubchandini SR. Fine needle cytology of lymph nodes. *J Postgrad Med*. 1987;33:134-6.
3. Pavithra P, Geetha JP. Role of fine needle aspiration cytology in the evaluation of the spectrum of lymph node lesions. *Int J Pharm Bio Sci*. 2014;5(4):377-84.
4. Ajmal I, Imran A. Comparison of FNAC vs. excision biopsy for suspected tuberculous cervical lymphadenopathy. *Ann King Edward Med Coll*. 2003;9:216-8.
5. Shrivastav A, Shah HA, Shrivastav G, Santwani PM. Utility of acid-fast staining and re-aspiration in tubercular lymphadenopathy - 3 year study at tertiary centre. *Int J Med Sci Public Health*. 2013; 2:875-9.
6. Fatima S, Arshad S, Ahmed Z, Hasan SH. Spectrum of cytological findings in patients with Neck lymphadenopathy - experience in a tertiary hospital in Pakistan. *Asian Pac J Cancer Prev*. 2011;12:1873-5.
7. Cohen MB, Miller TR, Bottles K. Classics in cytology: note on fine needle aspiration of lymphatic glands in sleeping sickness. *Acta Cytol*. 1986;30(4):451-2.
8. Singh JP, Chaturvedi NK, Das A. Role of Fine needle aspiration cytology in the diagnosis of tuberculous lymphadenitis. *Indian J Pathol Microbiol*. 1989;32:100-4.
9. Dukare SR, Jadhav DS, Gaikwad AL, Ranka SN, Kale PB, D'Costa G. Fine needle aspiration cytology of cervical lymphadenopathy - a study of 510 cases. *Asian J Sci Technol*. 2014;5(9):537-40.
10. Pandav AB, Patil PP, Lanjewar DN. Cervical lymphadenopathy diagnosis by FNAC: a study of 219 cases. *Asian J Med Res*. 2012;1(3):79-83.
11. Rajshekaran S. Tuberculous cervical lymphadenitis in HIV positive and negative patients. *Indian J Tuberc*. 2001;48:201-4.
12. Chandanwale S, Buch A, Verma A, Shruthi V, Kulkarni S, Satav V. Evaluation of granulomatous lymphadenitis on fine needle aspiration cytology - diagnostic dilemma. *Int J Pharm Bio Sci*. 2014;5(4):377-84.
13. Kochhar AK, Duggal G, Singh K, Kochhar SK. Spectrum of cytological findings in patients with lymphadenopathy in rural population of South Haryana, India - experience in a tertiary care hospital. *Internet J Pathol*. 2012;13(2):8.
14. Mohanty R, Wilkinson A. Utility of fine needle aspiration of lymph nodes. *IOSR J Dent Med Sci*. 2013;8(5):13-8.
15. Ahmed SS, Akhtar S, Akhtar K, Naseem S, Mansoor T, Khalil S. Incidence of Tuberculosis from study of Fine- Needle Aspiration Cytology in Lymphadenopathy and Acid- Fast Staining. *Indian J Community Med*. 2005;30(2):63-6.
16. Chand P, Dogra R, Chauhan N, Gupta R, Khare P. Cytological pattern of tubercular lymphadenopathy on FNAC: analysis of 550 consecutive cases. *J Clin Diagn Res*. 2014;8(9):FC16-9.
17. Khajuria R, Goswami KC, Singh K, Dubey VK. Pattern of lymphadenopathy on fine needle aspiration cytology in Jammu. *JK Sci*. 2006;8(3):157-9.
18. Das DK. Fine needle aspiration cytology in the diagnosis of tuberculous lesions. *Lab Med*. 2003;31(11):625-32.

19. Bezabih M, Marian DW, Selassie SG. Fine needle aspiration cytology of cervical lymphadenopathy with special reference to tuberculosis. *J Indian Med Assoc.* 1994;92:44-6.
20. Paliwal N, Thakur S, Mullick S, Gupta K. FNAC in tuberculous lymphadenitis: experience from a tertiary level referral centre. *Indian J Tuberc.* 2011;58:102-7.
21. Aggarwal P, Wali JP, Singh S, HandaR, Wig N, Biswas A. A clinico bacterial study of Peripheral tuberculous lymphadenitis. *J Assoc Physicians India.* 2001;49:808-12.
22. Bhardwaj K, Goyal T, Bhardwaj BL. Fine needle aspiration cytology in lymph node disorders with special reference to tuberculosis. *J Cytol.* 2000;17(3):155-9.
23. Lau SK, Wei WI, Hsu C, Engzell UCG. Efficacy of fine needle aspiration cytology in the diagnosis of tuberculous cervical lymphadenopathy. *J Laryngol Otol.* 1990; 104(1):24-7.
24. Paul PC, Goswami BK, Chakrabarti S, Giri A, Pramnisk R. Fine needle aspiration cytology of lymphnodes - an institutional study of 1448 cases over a five year period. *J Cytol.* 2004;21:187-90.
25. Finfer M, Perchick A, Barstein DE. Fine needle aspiration biopsy diagnosis of syndrome. Tuberculous lymphadenitis in patients with and without the acquired immune deficiency. *Acta Cytol.* 1991; 35:325-32.
26. Khan AH, Hayat AS, Baloch GH, Jaffery MH, Soomro MA, Siddiqui S. Study of FNAC in cervical lymphadenopathy. *World Appl Sci J.* 2011;12(11):1951-4.
27. Hirachand S, Lakhey M, Akhter J, Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu medical college teaching hospital. *Kathmandu Univ Med J.* 2009;7:139-42.
28. Adhikari P, Sinha BK, Baskota DK. Comparison of fine needle aspiration cytology and histopathology in diagnosing cervical lymphadenopathies. *Australas Med J.* 2011;4:97-9.
29. Patra AK, Nanda BK, Mahapatra BVK, Panda AK. Diagnosis of lymphadenopathy by fine needle aspiration cytology. *Indian J Pathol Microbiol.* 1983;26:272-8.
30. Bhaskaran CS, Kumar GH, Sreenivas M, Kamleshwari R, Rao G, Aruna CA. Fine needle aspiration cytology review of 1731 cases. *Indian J Pathol Microbiol.* 1990; 83:387-97.
31. Hafez NH, Tahoun NS. Reliability of fine needle aspiration cytology (FNAC) as a diagnostic tool in cases of cervical lymphadenopathy. *J Egypt Natl Cancer Inst.* 2011;23:105-14.

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