

Original research article

CYTOMORPHOLOGICAL STUDY OF LYMPH NODE LESIONS IN TERTIARY CARE HOSPITAL IN MADHYA PRADESH

¹Dr. Geeta Devi, ²Dr. Atul Kumar Pandey, ³Dr. Mariya khatoon Ansari, ⁴Dr Priyanka Solanki

^{1,2}Assistant Professor, Department of Pathology, Government Medical Collage, Shahdol, Madhya Pradesh, India

³Tutor, Department of Pathology, Government Medical Collage, Shahdol, Madhya Pradesh, India

⁴Assistant Professor, Department of Pathology, MGM Medical Collage, Indore, Madhya Pradesh, India

Corresponding Author:

Dr. Priyanka Solanki (Pinka15sept@gmail.com)

Abstract

Background: Lymph node enlargement is frequent presentation in all age groups with a wide spectrum of diseases, ranging from infections to malignancy. Fine needle aspiration cytology (FNAC) is a veritable tool for the assessment and diagnosis of lymph node lesions. The cytologic patterns of lymph node fine needle aspirations exhibit a wide variation in different diseases. The aim of present study to highlights the spectrum of cytological findings of various lymphadenopathies on fine needle aspiration cytology

Methods: This prospective study was in the department of pathology, a tertiary care hospital M.P., India. All age group patients with lymphadenopathy enrolled in the study. The cytomorphological features of lymph node were evaluated by FNAC and critically analysed and correlated with their aetiology

Result: Out of 125 cases, cervical lymph nodes were the commonly 87 (69.6%) involved. Tuberculosis Lymphadenitis was predominantly (24%) diagnosed followed by Reactive Lymphadenitis (23.2%) cases. Most of the Lymphadenopathy (89.6%) was benign in nature, Metastatic Lymphadenitis was reported in 8.8% cases and lymphoma was in 1.6% cases

Conclusion: FNAC is a simple, safe, reliable, and inexpensive method in early detection of lymph node lesions, which has been proven in this study again.

Keywords: Fine needle aspiration cytology (FNAC), lymphadenopathy, lymph node, tuberculous lymphadenitis, reactive lymphadenitis

Introduction

Lymph nodes are an integral component of the immune system, the common sites of distribution are cervical, axillary, mediastinal, retroperitoneal, iliac, and inguinal

regions. Enlargement of lymph node known as lymphadenopathy whereas inflammation of the lymph node suggest lymphadenitis ^[1]. Lymphadenopathy is most commonly seen in clinical practice of patients attending outpatient department, they are the commonest aspirated organs for diagnostic purpose ^[2]. Lymphadenopathy may be an incidental finding or it may be a primary or secondary manifestation of underlying neoplastic or non-neoplastic disease. The spectrum of lesions may include inflammatory, infectious, autoimmune or malignant aetiology ^[3]. Fine needle aspiration cytology (FNAC) is the first line of investigation in evaluating peripheral lymphadenopathy due to frequent involvement of lymph nodes in regional and systemic disease. FNAC is a Rapid, simple, safe, reliable, pain free, easy accessible, inexpensive and most convenient bedside diagnostic tool for lymph nodes lesions and masses ^[4-6]. In developing countries, almost two third of the cases are due to tuberculosis. Tuberculous lymphadenopathy is the commonest form of extrapulmonary tuberculosis ^[7]. Various other lesions of lymph nodes that are diagnosed by FNAC include nonneoplastic lesions (reactive lymphadenopathy, granulomatous lymphadenitis like tuberculosis, and sarcoidosis), neoplastic lesions (lymphoma, such as non-Hodgkin's lymphoma and Hodgkin's lymphoma, and metastatic deposits) and other rare lesions like sinus histiocytosis, silicon adenopathy, dermatopathic lymphadenopathy, benign epithelial inclusions, and toxoplasmosis ^[8]. The cytomorphological features obtained in fine needle aspiration cytology correlate very well with histologic appearances of same lesion and in some situations has qualities of microbiopsy ^[9].

The purpose of our study was assessment of various peripheral lymphadenopathy through FNAC. The study highlights the cytomorphological spectrum of lymph node lesions in this region and also emphasises on cytological spectrum in diagnosis of tuberculosis lymphadenopathy.

Materials and Methods

This study was carried out in the Department of Pathology at a Tertiary Care Centre, Madhya Pradesh, India. This was a prospective study conducted over a period of 6 months, and a total of 125 cases of lymphadenopathy of varied etiologies were enrolled. All patients presenting with enlarged lymph node were included in the study except very tiny size (<1 cm) lymph node which can be accessible only USG guided FNAC were excluded from the study. Socio-demographic data and clinical history was collected from all the participants. All the study participants were subjected to standard FNAC procedure after taking consent from the patient or guardians.

FNAC procedure was performed under strict aseptic conditions; aspirated material was smeared onto two slides in each case. One slide was alcohol fixed and second slide was air-dried. Alcohol fixed smears were stained routinely by Haematoxylin and Eosin (H&E) and Papanicolaou (PAP) method; the air-dried smears were routinely stained by May- Grunwald-Giemsa stain. Ziehl-Neelsen (ZN) stain for acid-fast bacilli (AFB) was done when needed. All the slides were examining under the microscope and make a probable diagnosis. The cytological diagnosis for each case was based on cytomorphological features and available clinical information. The diagnoses were categorized broadly as tuberculous lymphadenitis, Reactive lymphadenitis, acute suppurative lymphadenopathy, metastatic lymphadenopathy and lymphomas.

Statistical analysis

Data obtained were tabulated and expressed as percentages and proportions. P value <0.05 was taken to represent statistically significant.

Results

A total of 125 patients of enlarged lymph node enrolled in our study, out of which 67 were males and 58 females. A slight male preponderance with a male to female ratio of 1.15:1 was noted. The age of the patients varied from 06 month to 90 years, the maximum incidences (37.6%) of cases were seen in the age range of 16-30 years followed by 31-45 years age groups. Details distribution of cases shown in table 1.

Table 1: Showed age and Sex wise distribution of cases

S.no	Age Group (In Years)	Male	Female	Total	% of total case
1	6 months-15	10	6	16	12.8%
2	16-30	25	22	47	37.6%
3	31-45	21	15	36	28.8%
4	46-60	6	12	18	14.9%
5	61-75	4	3	7	5.6%
6	76-90	1	0	1	0.8%
	Total-	67	58	125	

Cervical lymph node was the common site of involvement (69.6%), most of them (91.9%) were unilateral. The other site of lymph node involved were submandibular (13.6%), axillary (5.6%), supraclavicular (4.8%), sub mental (3.2% and inguinal (3.2%), majority of the involved in unilateral side, only 50% inguinal was bilateral. (Shown in table 2).

Table 2: Site and Side of Lymph Node Group Involved In Various Lymph Node Lesions

S.no	Site	Side		Total	% of total case
		Unilateral	Bilateral		
1	Cervical	80	7	87	69.6%
2	Axillary	7	-	7	5.6%
3	Submandibular	17	-	17	13.6%
4	Supracalvicular	6	-	6	4.8%
5	Submental	4	-	4	3.2%
6	Inguinal	2	02	4	3.2%
	Total	116	09	125	100%

A cytological diagnosis by FNAC was made in 125 cases, out of them, 30 cases (24%) were diagnosed as tubercular lymphadenitis followed by 29 cases (23.2%) of reactive lymphadenitis, 19 cases (15.2%) of granulomatous lymphadenitis, 16 cases (12.8%) of chronic non-specific lymphadenitis, 11 cases (8.8%) of metastatic lymphadenitis, 09

(7.2%) cases of suppurative lymphadenitis abscess and Necrotizing Lymphadenitis and rest 02 cases (1.6%) of lymphoma. (Table 3)

The majority of cases recorded were those of Tuberculous Lymphadenitis (24%) in which most of them from the cervical group of lymph nodes

Table 3: Cytomorphological Lesion of Lymph Node

S.no	Cytomorphological Diagnosis	No of Cases	Percentage %
1	Suppurative Lymphadenitis/Abscess	09	7.2%
2	Tuberculous Lymphadenitis	30	24.00%
3	Granulomatous Lymphadenitis	19	15.2%
5	Reactive Lymphadenitis	29	23.2%
6	Chronic Non Specific Lymphadenitis	16	12.8%
7	Necrotizing Lymphadenitis	09	7.2%
8	Metastatic Lymphadenitis	11	8.8%
9	Lymphoma	02	1.6%
	Total-----	125	100%

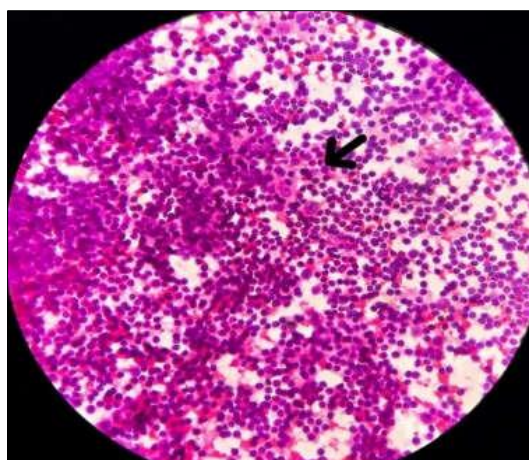


Fig 1: Aspirates from reactive lymphadenitis, showing polymorphous population of lymphoid cells and a tingible body macrophage (arrow) (H & E, 40x)

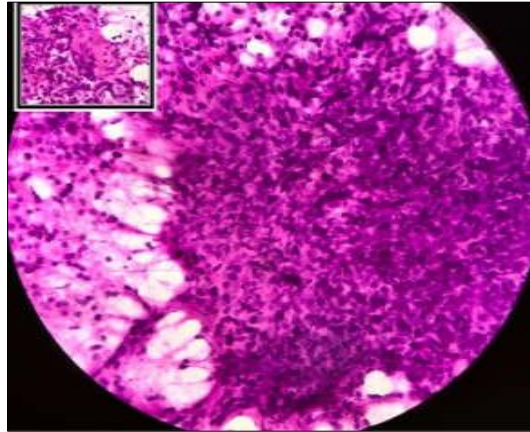


Fig 2: Aspirates from tuberculous lymphadenitis show well-formed granulomas and inset shows giant cell with epithelioid cells (H&E, 40X)

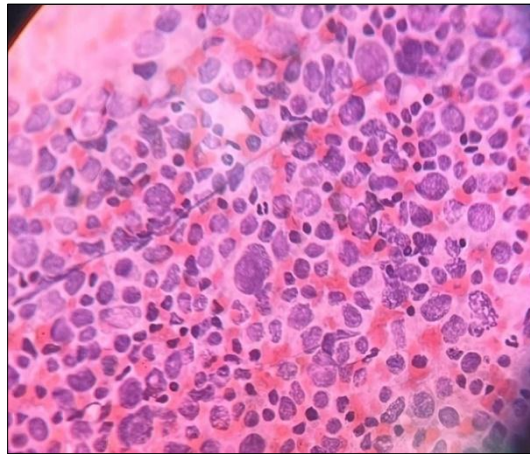


Fig 3: Non-hodgkin's lymphoma (Giemsa stain, 40x)

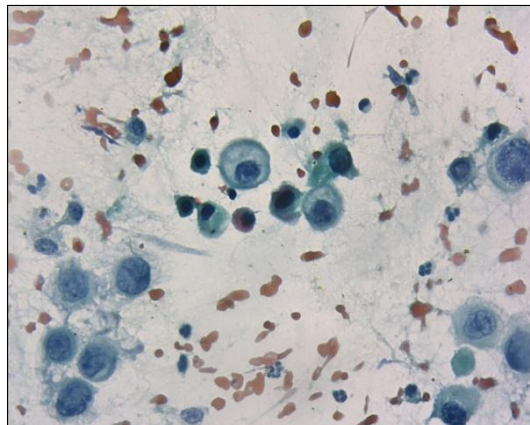


Fig 4: Metastatic deposits of squamous cell carcinoma, smear showing malignant cell against a hemorrhagic background (Pap stain, 40X)

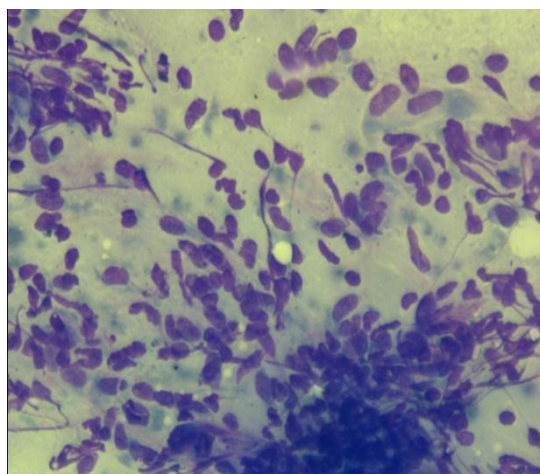


Fig 5: Granulomatous lymphadenitis, smear showing epithelioid cell granuloma with caseation (Pap stain, 40x)

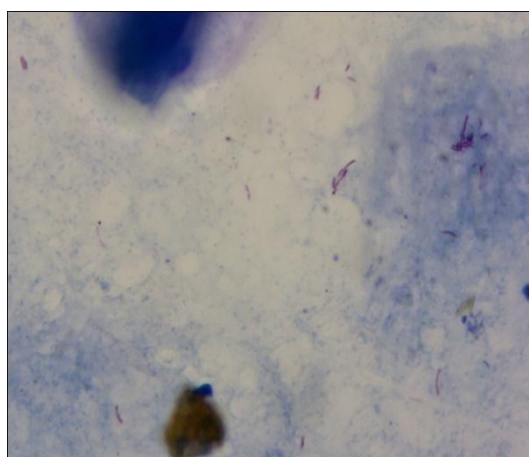


Fig 6: Mycobacterium tuberculosis (ZN stain, 100X).

Discussion

Lymphadenopathy has many underlying causes, ranging from self-limiting acute or chronic inflammatory diseases, benign disease to severe neoplastic proliferations. FNAC is a best reliable tool for the initial investigation of enlarged lymph nodes. In the present study majority of the patients belong to 16-30 years age groups which was comparable with the study done by Chaithra S *et al.*^[10] and Patel AS *et al.*^[11]. A slight male predominance was noted in the current study, concordance to the studies conducted by M Dedeepya *et al.* [12] and Khajuria *et al.*^[13], discordance to that Anand B *et al.*^[14] observed female predominance in their study.

In our study cervical lymph nodes were most commonly involved, which is similar to the many other studies like Chaurasia RK *et al.*^[15], Ashwini HN *et al.*^[16] and Pavithra *et al.*^[17]. In the present study Submandibular lymph node involvement was the second most common group of lymph nodes after the cervical which was quite similar to the Biradar *et al.*^[18]. Current study found tuberculous lymphadenitis was most commonly cytomorphologically diagnosed lesion, comparable to the many other studies like: Kochher *et al.*^[19] and Shilpa *et al.* [20].

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. But, in a region (like our country) where tuberculous infection is common and other granulomatous diseases are rare, the presence of a granulomatous feature in FNAC is highly suggestive of tuberculosis. In our study reactive lymphadenitis was observed second most common lymph node lesion after the tuberculous lymphadenitis whereas studies conducted by Gandhi, *et al.* [21] and Sushma R *et al.* [22] observed reactive lymphadenitis was the most common lesion. In the present study lymphoma was rarely diagnosed by cytomorphologically observed only in 1.6% cases, this was accordance to the Sameer A *et al.* [23] found lymphoma in 1.81% cases. Suppurative Lymphadenitis/Abcess formation found in 7.2% cases in current study, similarly Majithia *et al.* [24] reported 5% Abcess formation in their study.

ZN staining for acid fast bacilli was seen in 20.6% cases in our study, similar finding also reported by Sharma P *et al.* [25]. Low incidence of AFB positivity in our study could be due to compromised immune status or inadequacy of the cellular immune response, epithelioid cell granulomas with necrosis and cases with epithelioid cell granulomas without necrosis.

Majority of lymphadenopathies in this study were due to benign conditions (89.6%), which was in accordance with earlier studies Biradar *et al.* [18] and Ahmad S *et al.* [26]. FNAC provides a simple, reliable and convenient method for the initial management of cervical lymphadenopathy. FNAC has a valuable role in diagnosing neoplastic and metastatic lesions.

Conclusion

Lymphadenopathy is a commonly encountered clinical condition requiring prompt and accurate diagnosis to provide treatment as early as possible. FNAC is the first line gold standard valuable tool for the diagnosis of lymph node lesions. We conclude that cervical lymph nodes were most commonly encountered. Tuberculous lymphadenitis was the most common presentation followed by reactive lymphadenitis.

Conflict of interest

The authors declare that they have no conflict of interest.

Funding

Nil

References

1. Bhatta S, Singh S, Sangita RC. Diagnostic value of fine needle aspiration cytology, in the assessment of cervical lymphadenopathy. *Med Phoenix*. 2018;3(1):36-40.
2. Akhter R, Hamdani SM, Qayoom N, Reshi R. Cytological pattern of cervical lymphadenopathy in children in a tertiary care hospital. *J Cytol Histol*. 2018;9:4. DOI:10.4172/2157-7099.1000512.
3. Badge SA, Ovhal AG, Azad K, Meshram AT. Study of fine-needle aspiration cytology of lymph node in rural area of Bastar District, Chhattisgarh. *Med J DY Patil Univ*. 2017;10(2):143-48.
4. Orell SR, Sterrett GF, Whitaker D. Lymph Nodes. In: Miliauskas J, editor. *Fine*

- needle aspiration cytology. 5th ed. Edinburgh: Churchill Livingstone, Elsevier, 2012, 77-111.
5. Vimal S, Dharwadkar A, Chandanwale S, Vishwanathan V, Kumar H. Cytomorphological study of lymph node lesions: A study of 187 cases. *Med J Dr DY Patil Univ* 2016;9:43.
 6. Chand P, Dogra R, Chauhan N, Gupta R, Khare P. Cytopathological pattern of tubercular lymphadenopathy on FNAC: Analysis of 550 consecutive cases. *J Clin Diagn Res.* 2014;8:FC16-9.
 7. 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.
 8. Chawla N, Nandini NM. FNAC in lymph node disorders a hospital study in Southern India. *J Cytol.* 2007;24(2):105-7.
 9. Shamsad Ahmad S, Akhtar Shakeel, *et al.* Study of Fine Aspiration Cytology in Lymphadenopathy with special reference to Acid Fast Staining in cases of Tuberculosis. *JK Science.* 2005;7(1):1-4.
 10. Chaithra S, Deoshree Solanki, Prabhu H Mural. Cytomorphological Study of Lymph Node Lesions: A Study of 130 Cases. *Indian J Pathol Res Pract.* 2020;9(2-1):27-32.
 11. Patel MM, Italiya SL, Dhandha ZB, Dudhat RB, Kaptan KR, Shah MB, *et al.* Study of metastasis in lymph node by fine needle aspiration cytology: Our institutional experience. *Int J Res Med Sci.* 2013;1:451-4.
 12. Dedeepya M, Ramaswamy AS, Kumarguru BN, Udaya Kumar M. A Comparative Study of Cytomorphological Patterns of Lymph Node Aspirates in Paediatric and Adult Populations, *Journal of Clinical and Diagnostic Research.* 2020 Oct;14(10):EC01-EC06.
 13. Khajuria R, Goswami KC, Singh K, Dubey VK. Pattern of lymphadenopathy on FNAC in Jammu. *JK Sci.* 2006;8:157-9.
 14. Anand B, Mariaselvam A. Cytomorphology of lymphadenopathy with a report on patterns of tuberculous lymphadenitis in a resource limited setting. *J Curr Res Sci Med.* 2020;6:45-50.
 15. Chaurasia RK, Sharma P. A cytological study of pattern of lymph node lesions at tertiary care centre in Uttar Pradesh. *International Journal of Research and Review.* 2019;6(12):568-573.
 16. Ashwani HN, Mounika TS, Sneha SP, Ram SDM, Shruthi Goyal S, Cytomorphological spectrum of enlarged lymph nodes, *Indian J pathol Oncol.* 2021;8(2):294-298.
 17. 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.
 18. Shilpa Somashekar Biradar, Deepa Siddappa Masur, Spectrum of Lymph Node Lesions by Fine Needle Aspiration Cytology: A Retrospective Analysis, *Annals of Pathology and Laboratory Medicine.* 2017 May-June, 4(3).
 19. Kochhar G, Duggal K, Singh S Kochhar. Spectrum of cytological findings in patients with lymphadenopathy in rural population of southern Haryana, India—Experience in a tertiary care hospital. *The Internet Journal of Pathology.* 2012;13:2:1-6.

20. Shilpa G, Nataraju G. Pattern of lymph node diseases in a tertiary level referral center: a cytological study of 943 cases. *International Journal of Biological and Medical Research*. 2013; 4(3):3448–52.
21. Gandhi S, chandel S, Singh AD. Cytomorphological Evaluation of enlarged lymph nodes: a tertiary hospital-based study. *J med Sci res*. 2022;5:68-71.
22. Gulhane Sushma R, Ghanghurde Swati B, Gangane Nitin. Cytomorphological evaluation of lymph node lesions by FNAC: a study of 252 cases, *Indian journal of applied research*. 2019 June, 9(6). print ISSN no. 2249 - 555x
23. Sameer A Kadam, Arun T Miskin, Vijay D Dombale. Role of FNAC in study of cytomorphological patterns in cervical lymph node, *Medica Innovatica*. 2020 Jul-Dec;9(2):88-91.
24. Majithia HJ, Algotor C, Chokshi T, Mori NK, Ghelani S. Cytomorphological study of lymph node lesions, *IP Arch Cytol Histopathology Res*. 2020;5(4):280-282.
25. Sharma P, Rana S, Gill MK, Singh P, Satarkar RN, Kalhan S. Spectrum of lymph node lesions on cytology in rural Haryana: a retrospective analysis. *Int J Res Med Sci*. 2015;3:1125-30.
26. Ahmad S, Akhtar S, Akhtar K, Naseem S, Mansoor T. Study of Fine needle aspiration cytology in lymphadenopathy with special reference to acid-fast staining in cases of tuberculosis. *JK science*. 2005;7(1):1-4.