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A study on cervical lymphadenopathy in a rural based teaching hospital in India

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ABSTRACT

Background: Presence of cervical lymphadenopathy may indicate serious systemic disease process. Proper evaluation of cervical lymphadenopathy is of extreme clinical importance. **Aims and Objective:** The study objective was to evaluate clinical and demographic profile of cervical lymphadenopathy, to find the etiology, and to study the role of fine-needle aspiration cytology (FNAC) in it's etiological diagnosis. **Materials and Methods:** Prospective observational study was carried out in a rural based teaching hospital in India for 1 year. One hundred and twenty-one patients of more than 12 years of age from both genders were included in the study. Detailed history, clinical, blood examination, radiological, microbiological evaluation, and FNAC from lymph node were done for all patients. Excision biopsy was done for selective cases. **Results:** It was a male predominant study with male: female ratio of 1.12:1 and mean age of the patient was 34.54 years. Cervical lymphadenopathy was mostly unilateral (77.69%) and it was more common in the right side (43.80%). Tuberculosis (TB) (36.37%) was the most common cause of cervical lymphadenopathy in our study followed by reactive hyperplasia of lymph node (23.14%) and metastatic deposit (19%). Among metastatic deposit, 9 (39.13%) had squamous cell carcinoma, 5 (21.74%) had adenocarcinoma, and 1 (4.35%) had small cell carcinoma. **Conclusion:** TB is the most common cause of cervical lymphadenopathy followed by reactive hyperplasia and metastatic secondary deposit. FNAC is a simple inexpensive relatively painless rapid and reliable method for diagnosis which can be considered as a frontline investigation and can guide requirement for further investigation in the management of cervical lymphadenopathy.

Key words: Cervical lymphadenopathy; Tubercular lymphadenopathy; Metastatic lymphadenopathy

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INTRODUCTION

Lymph nodes are an integral component of the immune system. The neck consists of nearly two-third of the total lymph nodes of the body. Cervical lymphadenopathy may present with an abnormal increase in size and altered consistency of lymph nodes. The enlargement of these lymph nodes is quite significant in that there are so many etiological agents and are an index spread of infections and malignancy.[1] Cervical lymphadenopathy can present as an isolated feature or as part of generalized lymphadenopathy.[2,3] Etiology may vary in different geographical location depending on demographic profile of that region. One of the previous studies have shown that there is a change of proportion of different etiologic category over a decade in same geographical area.[4] All of these commonly create confusion among clinician regarding proper management approach of patients having cervical lymphadenopathy. Fine-needle aspiration cytology (FNAC) is a safe, reliable, rapid, and inexpensive method of establishing the diagnosis of a lesion and also helps in indicating the pattern of the investigation.[5]

Although few studies regarding such clinical manifestation are being published in India in the past, most of the studies are from developed countries of the world. Hence, there is an urge for a new study in this clinical condition particularly on subjects from population living in rural area.

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Aims and objectives

This study was carried out with the objective of evaluating clinical and demographic profile of cervical lymphadenopathy cases, to find the etiology of cervical lymphadenopathy, and to study the role of FNAC in etiological diagnosis of cervical lymphadenopathy.

MATERIALS AND METHODS

This prospective observational study was carried out with patients of cervical lymphadenopathy attending to the Respiratory Medicine department of Midnapore Medical College and Hospital in Paschim Medinipur district of West Bengal, India. This institution serves as the only teaching hospital in that district and patients attending to this hospital are mostly of rural background. The study period was 1 year from October 2019 up to September 2020. We included patients of more than 12 years age of both genders having cervical lymphadenopathy of more than one centimeter diameter. Immunocompromised patient having cervical lymphadenopathy, those already diagnosed, and undergoing treatment and those unwilling to give consent were excluded from this study. The study proposal was placed before the Institutional Ethics Committee for approval and permission obtained.

After getting patient consent, detailed history, including demographic data and clinical examination of lymph node including involvement of other groups of lymph nodes, was done. Systemic examination and routine hematological, biochemical, and serological test were conducted on each case. Sputum examination, chest X-ray, ultrasonography, and lymph node discharge examination for microbiological assessment were carried out in clinically relevant cases. After making a clinical diagnosis, all patients were subjected to fine-needle aspiration cytology. Both cytological and microbiological observations were recorded. In cases, where fine-needle aspiration cytology was inconclusive and or there was a strong clinical suspicion of alternate diagnosis those offered for excision biopsy. Special investigation such as CT scan, fungal preparation, aspiration, and examination of body fluid and image-guided biopsy was done in selected cases.

Data analysis

All data collected in a pre-designed structural pro forma were first entered into a Microsoft Excel spread sheet, 2007 version and then analyzed by SPSS, version 20 software.

RESULTS

Our study included 121 cases of cervical lymphadenopathy, of which 64 patients (52.89%) were male and 57 patients (47.11%) were female. Male: female ratio was 1.12:1.

The mean age of all patient presented with cervical lymphadenopathy was 34.54±1.417 years (mean±SEM). Youngest patient was 12 years of age and oldest of 75 years.

In most of the occasion, cervical lymphadenopathy was unilateral (n=94, 77.69%). Bilateral involvement was observed in 23.31% (n=27) cases. It was more common in the right side (n=53, 43.80%). Most cases were presented with solitary lymphadenopathy (n=76, 62.81%) rather than multiple (n=45, 37.19%) one.

Etiology of cervical lymphadenopathy (Table 1) cases was identified as tuberculosis (TB) (36.37%), reactive hyperplasia of lymph node (23.14%), metastatic malignancy (19%), suppurative inflammation (11.57%), non-specific inflammation (6.61%), lymphoproliferative disorders (1.65%), and sarcoidosis (0.83%). One case (0.83%) remained undiagnosed despite full workup.

Age distribution of cervical lymphadenopathy according to different etiology was calculated. Among 121 cases, cervical lymphadenopathy was most common in 21–30 years age group (32 cases, 26.45%) followed by <20 years age group (31 cases, 25.62%), 31–40 years age group (27 cases, 22.31%), 41–50 years age group (14 cases,11.57%), 51–60 years group (9 cases,7.44%), and only eight cases (6.61%) in above 60 age group. Hence, most of the cases seen among patients of below 50 years of age. When we closely look into the data, it indicates that most of the infective, inflammatory, and reactive hyperplasia cases which are usually benign in nature tend to occur in younger (<50 years) age group compared to most of the malignant and lymphoproliferative disorders observed to appear in more advanced (>50 years) age group (Figure 1).

Tubercular lymphadenopathy (n=44, 36.37%) was the most common etiology behind cervical lymphadenopathy in our study. Among 44 cases, only 12 (27.27%) had contact history of TB. Physical appearance of tubercular cervical lymphadenopathy is observed as (Figure 2) matted (n=20, 45.45%), discrete (16, 36.36%), sinus (4, 9.09%), abscess (3, 6.81%), and ulcer (n=1, 2.27%). During blood examination, ESR was raised among 27 (61.36%) patients.

Table 1: Etiology of cervical lymphadenopathy

Diagnosis	Number	Percentage
Tuberculosis	44	36.37
Reactive hyperplasia	28	23.14
Metastatic malignancy	23	19
Suppurative inflammation	14	11.57
Nonspecific inflammation	8	6.61
Lymphoproliferative disorders	2	1.65
Sarcoidosis	1	0.83
Undiagnosed	1	0.83
Total	121	100

During cytological and histopathological examination of lymph node of tubercular cases, mainly, three patterns were observed. Granulomatous lesion with caseation necrosis (n=26, 59.09%) was most common pattern (Figure 3) followed by Granulomatous lesion without caseation necrosis (n=15, 34.09%) and only necrosis (4, 9.09%) in few cases. Bacteriological evidence of tubercle bacilli was found in total 11 cases (25%) either by ZN staining(eight cases) or CBNNAT testing (three cases) or culture (one case). Bacteriological positivity was more common in only necrotic group (75%) compared to other groups. Not a single patient was reported of having Rifampicin resistance during CBNAAT testing. During radiological investigation, pulmonary infiltrate was detected in five (11.36%) cases among them one had cavitary lesion also. Pleural effusion was found among two (4.55%) of the TB cases.

Among 23 cases with metastatic deposit of cervical lymph node (Figure 4), 9 (39.13%) had squamous cell carcinoma, 5 (21.74%) had adenocarcinoma, and 1 (4.35%) had small cell carcinoma. Poorly differentiated carcinoma was seen in 4 (17.39%) cases and another four cases (17.39%) had unclassifiable cytological and histological features. Two patient (4.55%) had lymphoproliferative disorder; among them, one 15-year-old boy had acute lymphoid leukemia and another 62-year-old lady was diagnosed as non-Hodgkin lymphoma.

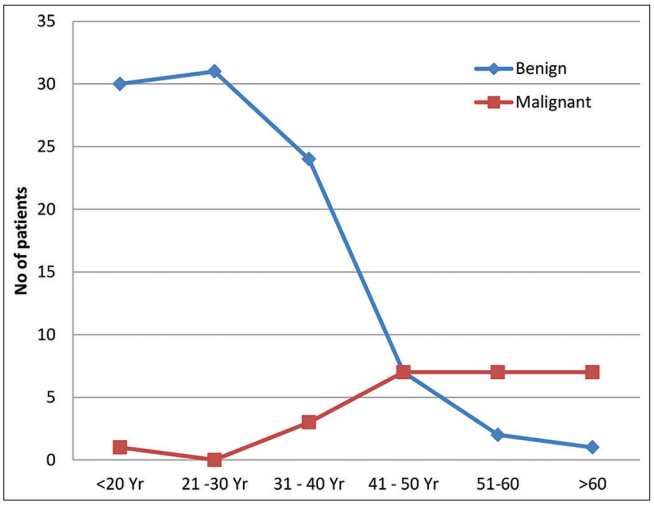

Figure 1: Line diagram showing age distribution of cervical lymphadenopathy. Benign disorders usually more frequently seen in younger age group whereas malignant processes are more common in advance age group

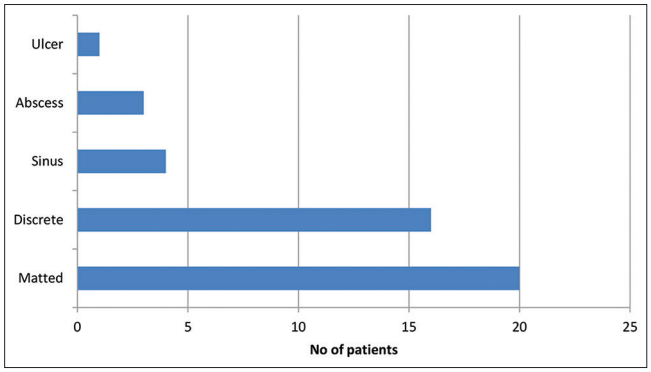

Figure 2: Bar diagram showing physical appearance of tubercular lymphadenopathy

DISCUSSION

Lymphadenopathy as a clinical manifestation serves an excellent clue to the underlying disease. It can arise either from benign or malignant causes depending on the geographical condition and socioeconomic setup.[6] In the present prospective observational study, 121 cervical lymphadenopathy cases were evaluated. TB (36.37%) was the most common cause of cervical lymphadenopathy in our study followed by reactive hyperplasia of lymph node (23.14%) and metastatic deposit (19%). Jha et al.,[7] reported in their study a high incidence of

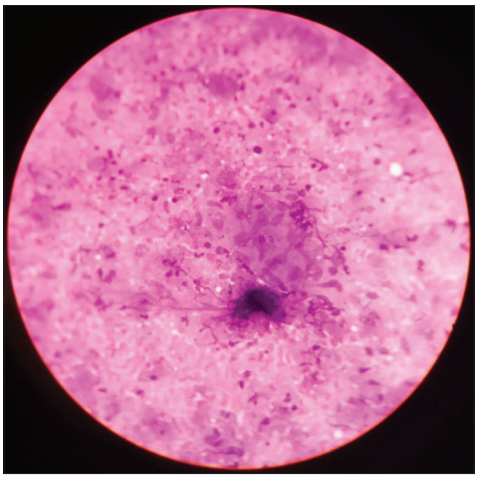

Figure 3: Fine-needle aspiration cytology from cervical lymphadenopathy in ×40 with PAP stain showing cytological picture of epithelioid granuloma in the background of caseation necrosis consistent with tuberculosis

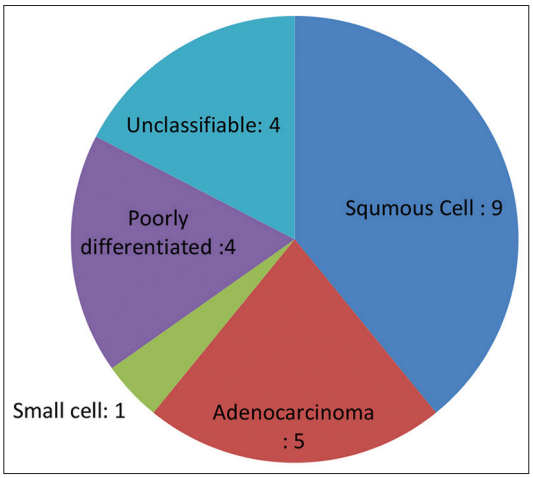

Figure 4: Pie diagram showing different types of metastatic deposit in cervical lymphadenopathy

TB lymphadenitis (63.8%) in the year 2001. Study conducted by Dasari et al.,[8] found TB (51.6%) as the most common cause of cervical lymphadenopathy followed by reactive/nonspecific lymphadenopathy (24.6%). They also found metastatic deposit in 12.33% cases. Batni et al.,[9] in their study, observed metastatic carcinoma in 17.18% cases of cervical lymphadenopathy. Our study findings were consistent with above-mentioned studies.

Cervical lymphadenopathy was slightly more common in male (52.89%) in the present study with male: female ratio of 1.12:1. The mean age of cervical lymphadenopathy was 34.54±1.417 years (mean±SEM). Batni et al.,[9] in their study on 64 patients with enlarged cervical lymph nodes, found male preponderance (53.1%) with mean age at the mid of third decade. Malhotra et al.,[10] in their study of lymphadenopathy, found mean age of 20.09 years for benign lesions and 45.48 years for malignant lesions. Our study have shown that most of the benign aetiologies behind cervical lymphadenopathy tend to occur in relatively younger (<50 years) age group whereas most of the malignant disorders behind cervical lymphadenopathy observed to appear in more advanced (>50 years) age group. Unilateral (77.69%) cervical lymphadenopathy was more common in our study and it was more common in the right side (43.80%). Dasari et al.,[8] found 76% of cervical lymphadenopathy in unilateral side and right side was involved in 43% cases. Overall solitary lymphadenopathy (62.81%) was more common than multiple (n=45, 37.19%). Subhan et al.,[11] also reported similar observation. In cases of tubercular lymphadenopathy, more cases presented with multiple and in matted form.

In a developing country like India, the incidence of TB is high and tubercular lymphadenitis is the commonest extra pulmonary manifestation of the disease.[12] Malhotra et al.,[10] in their study on lymphadenopathy cases in India, shown that the most common site of lymphadenopathy was cervical region (71.79%) followed by axillary region (11.11%). Tubercular lymphadenitis (44.02%) was the single most common cause of lymphadenopathy followed by reactive lymphadenitis (42.64%), metastatic lesions (9.40%), and malignant lymphoma (4.70%).

Dasari et al.,[8] in their study, found that 25% of tubercular lymphadenopathy had history of contact with TB patient. Our study found 27.27% tubercular cervical lymphadenopathy patient of having positive contact history. In our study, we found more number of matted lymphadenopathy than discretes one. Abscess formation, ulcer, and sinus were less common. Similar observations were also reported by Dandapat et al.[13] and Subrahmanyam et al.[14]

FNAC is one of the most important diagnostic investigations in the evaluation of tubercular lymphadenitis. It is a safe, easy, and cost effective procedure which minimizes the requirement of an invasive excision biopsy in majority of cases.[15] In case of suspected TB lymphadenitis, the aspirated material is stained with ZN stain to confirm the presence of the causative organism.[16] Paliwal et al.,[17] stated that FNAC is both safe and sensitive for the diagnosis of TB lymphadenitis. Chand et al.,[18] found an incidence of acid fast bacilli (AFB) positivity of 44.5%. Our study displays bacteriological confirmation in 25% of tubercular lymphadenopathy cases. AFB positivity (75%) was most commonly found in those smears, in which there was presence of only caseous necrosis. Paliwal et al.,[17] found similar correlation between morphologic appearance of cytologic smear and AFB positivity in cases of TB lymphadenitis. This may be a reason why we got a less number of bacteriological evidence as most of our cases had granulomatous lesion and only few (9.09%) had only necrosis. During radiological evaluation, we found pulmonary infiltrate in 5 (11.36%) cases of tubercular cervical lymphadenopathy. Compared to result of study by Magsi et al.,[19] who found 7.5% coexisting active tubercular lesion in chest, we observed more radiological lesion. It may be possible as we have done CT scan of thorax in some cases.

We found metastatic deposit in 23 (19%) cases of cervical lymphadenopathy. Squamous cell carcinoma (39.19%) was the most common lesion found followed by adenocarcinoma (21.74%). Khajuria et al.,[12] and Hirachand et al.,[20] found similar pattern in their study.

Limitations of the study

Our study was limited by few factors like having relatively lesser number of sample size, after initial diagnosis further follow-up of all cases were not done, the study was conducted in a smaller geographical region and possible presence of referral bias cannot be ruled out. Wave of COVID-19 pandemic disrupted the preplanned study framework partially. Further, multicentric studies with more number of sample size with follow-up of all patient may provide more updated information regarding this clinical condition.

CONCLUSION

TB is the most common cause of cervical lymphadenopathy followed by reactive hyperplasia and metastatic secondary deposit. Among secondary deposits, squamous cell pattern is most common. Overreliance with clinical findings may not be sufficient in establishing root cause. Although excision biopsy of lymph node is gold standard for diagnosis, FNAC as a simple, inexpensive, relatively painless, rapid, repeatable, and reliable method for diagnosis can be placed as a frontline investigation which can guide requirement for further investigation.

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REFERENCES

1. Mili MK and Phookan J. A clinico-pathological study of cervical lymphadenopathy. Int J Dent Med Res. 2015;1(5):24-27.
2. Sambandan T and Christeffi Mabel R. Cervical lymphadenopathy a review. JIADS. 2011;2(1):31-33.
3. Stutchfield CJ and Tyrrell J. Evaluation of lymphadenopathy in children. Pediatr Child Health. 2012;22(3):98-102.
   https://doi.org/10.1016/j.paed.2011.09.003
4. Dasgupta S, Chakraborty S and Sarkar S. Shifting trend of tubercular lymphadenitis over a decade a study from Eastern Region of India. Biomed J. 2017;40(5):284-289.
   https://doi.org/10.1016/j.bj.2017.08.001
5. Wilkinson AR, Mahore SD and Maimoon SA. FNAC in the diagnosis of lymph node malignancies: A simple and sensitive tool. Indian J Med Paediatr Oncol. 2012;33(1):2124.
   https://doi.org/10.4103/0971-5851.96964
6. Qadri SK, Hamdani NH, Shah P, Lone MI and Baba KM. Profile of lymphadenopathy in Kashmir valley: A cytological study. Asian Pac J Cancer Prev. 2012;13(8):36213625.
   https://doi.org/10.7314/apjcp.2012.13.8.3621
7. Jha BC, Dass A, Nagarkar NM, Gupta R and Singhal S. Cervical tuberculous lymphadenopathy: Changing clinical pattern and concepts in management. Postgrad Med J. 2001;77(905):185-187.
   https://doi.org/10.1136/pmj.77.905.185
8. Dasari P, Varanasi S, Pattnayak S, Nagababu and Nandini. Cervical lymphadenopathy: A prospective study in Rajiv Gandhi institute of medical sciences, Srikakulam, Andhra Pradesh. Int J Sci Stud. 2016;4(5):233-238.
   https://doi.org/10.17511/ijmrr.2015.i9.172
9. Batni G, Gaur S, Sinha ON, Agrawal SP and Srivasatva A. A clinico-pathological study of cervical lymph nodes. Indian J Otolaryngol Head Neck Surg. 2016;68(68):508-510.
   https://doi.org/10.1007/s12070-016-1015-z
10. Malhotra AS, Lahori M, Nigam A and Khajuria A. Profile of lymphadenopathy: An institutional based cytomorphological study. Int J App Basic Med Res. 2017;7(2):100-103.
    https://doi.org/10.4103/2229-516X.205812
11. Subhan AR, Shilpa G, Hamza AM, Chaitra BE and Francis R. Role of fine needle aspiration cytology as a diagnostic tool in lymphadadenopathy with utility of CBNAAT in tubercular lymphanenopathy. IP Arch Cytol Histopathol Res. 2019;4(1):61-64.
    https://doi.org/10.18231/2456-9267.2019.0010
12. Khajuria R, Goswami KC, Singh K and Dubey VK. Pattern of lymphadenopathy on fine needle aspiration cytology in Jammu. JK Sci. 2006;8(3):145-149.
13. Dandapat MC, Mishra BM, Dash SP and Kar PK. Perepheral lymph node tuberculosis: A review of 80 cases. Br J Surg. 1990;77(8):911-912.
    https://doi.org/10.1002/bjs.1800770823
14. Subrahmanyam M. Role of surgery and chemotherapy for peripheral lymph node tuberculosis. Br J Surg. 1993;80(12):1547-1548.
    https://doi.org/10.1002/bjs.1800801218
15. Lakhey M, Bhatta CP and Mishra S. Diagnosis of tubercular lymphadenopathy by fine needle aspiration cytology, acid-fast staining and Mantoux test. J Nepal Med Assoc. 2009;48(175):230-233.
    https://doi.org/10.31729/jnma.188
16. Hemalatha A, Shruti PS, Kumar MU and Bhaskaran A. Cytomorphological patterns of tubercular lymphadenitis revisited. Ann Med Health Sci Res. 2014;4(3):393-396.
    https://doi.org/10.4103/2141-9248.133466
17. Paliwal N, Thakur S, Mullick S and Gupta K. FNAC in tuberculous lymphadenitis: Experience from a tertiary level referral centre. Indian J Tuberc. 2011;58(3):102-107.
18. Chand P, Dogra R, Chauhan N, Gupta R and Khare P. Cytopathological pattern of tubercular lymphadenopathy on FNAC: Analysis of 550 consecutive cases. J Clin Diagn Res. 2014;8(9):16-19.
    https://doi.org/10.7860/JCDR/2014/9956.4910
19. Magsi PB, Jamro B, Shaikh AA and Sangi HA. An audit of 140 cases of cervical lymphadenopathy at tertiary care hospital. Gomal J Med Sci. 2013;11(1):47-48.
20. Hirachand S, Lakhey M, Akhter J and Thapa B. Evaluation of fine needle aspiration cytology of lymph nodes in Kathmandu Medical College, Teaching hospital. Kathmandu Univ Mem J. 2009;7(26):139-142.
    https://doi.org/10.3126/kumj.v7i2.2707

Authors Contribution:
AD- Concept and design of the study, Reviewed the literature, Collection and analysis of data, Prepared first and final draft of the manuscript; **PM-** Supervision of the study, Validation, Revision of the manuscript for critical intellectual content; **PRC-** Concept, Coordination, analysis and interpretation, Validation, Revision of the manuscript; **SKS-** Concept of the study, Collection of data, Coordination and revision of the manuscript.

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