

Assessment of peripheral lymph node tuberculosis: a prospective study of 24 cases

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ABSTRACT

Introduction: Tubercular lymphadenitis which comes under Extra-pulmonary Tuberculosis (EPTB) has been affecting mankind since ancient times. Peripheral lymph node involvement is the commonest form of EPTB among which cervical lymph nodes are most frequently affected.

Objectives: The aim of this study was to evaluate the demographic, clinical characteristics and treatment outcomes of peripheral lymph node Tuberculosis cases in a rural tertiary health care centre.

Methods: The study was conducted prospectively at Prathima Institute of Medical Sciences, Nagunur, Karimnagar between January 2021 to August 2022. Pathologically confirmed cases of lymph node Tuberculosis were assessed and followed up.

Results: 24 cases of lymph node TB were included with 83.3% females and 16.6% males ($p=0.02$) with a mean age of 32.6 ± 15.24 years. The mean age among males was 37 ± 15.59 years and among females was 31.75 ± 15.24 years. 58.3% were from rural areas. All of them presented with a history of swelling, 37.5% had a fever, 50% had a loss of appetite and 54.1% had a loss of weight. 8% had a past history of tuberculosis. 79.1% had cervical swelling and 20.8% had axillary swelling. 83.3% had multiple lymph nodes and 33.3% had lymph node matting. Three cases were lost to follow-up, 79% improved with standard anti-Tuberculosis treatment (ATT) and one case died during treatment.

Conclusion: Lymph node TB is still prevalent in TB endemic countries and has to be considered first in the differential diagnosis of peripheral lymph node swellings.

KEYWORDS: caseating granulomas, extrapulmonary tuberculosis, lymphadenitis

INTRODUCTION

Extrapulmonary TB comprises 10-50% of all TB cases in HIV-negative subjects and 35-80% among HIV-infected subjects. EPTB constitutes 15 to 20% of all TB cases in India and 40% of EPTB cases are TB lymphadenitis with cervical lymph nodes being the most common site

followed by mediastinal and axillary lymph nodes.^[1] Lymph node TB irrespective of location of nodes is considered Extra Pulmonary TB and is an easily diagnosable, easily treatable and least complicated form of EPTB.^[2] Lymph node TB formed 20% of EPTB cases among immunocompetent individuals and 50% of EPTB cases in HIV-positive individuals in India in 2020.^[3]

In humans, *Mycobacterium tuberculosis* usually results in a primary complex with the formation of a granuloma in a thoracic lymph node.^[4] These lymph nodes act as niches for the growth and persistence of *Mycobacterium tuberculosis*, reactivation of which leads to tubercular lymphadenitis; other nodes being spread from a lung lesion, spread from a TB tonsil or by hematogenous spread.^[1]

TB lymph node is considered to be the local manifestation of a systemic disease.^[5] Primary lymph node TB, which is due to direct exposure to infection, is rare and secondary lymph node TB occurs due to the reactivation of dormant TB bacilli in the lymph nodes.^[6] Lymphadenitis is also caused by Non mycobacterial infections as well as bacterial infections hence thorough microbiological investigations are required for correct diagnosis.

The present study aims to determine the demographic characteristics, clinical presentation, different diagnostic approaches and pathological aspects of cases of peripheral lymph node TB and to assess the value of short-term chemotherapy.

Materials:

The present study involved 24 patients with peripheral lymph node swellings attending the outpatient department of Respiratory medicine at Prathima Institute of Medical Sciences, Nagunur, Karimnagar, which is a rural-based tertiary health care centre, from January 2021 to August 2022. For the purpose of this study, peripheral swellings arising from cervical, axillary and inguinal regions were evaluated. Informed consent in the subject's own language was taken and strict confidentiality was maintained regarding the results. Institutional Ethics Committee clearance of Prathima Institute of Medical Sciences, Karimnagar was obtained as per the guidelines.

METHODS

After a detailed history and thorough physical examination, patients underwent routine investigations like complete blood picture, ESR (erythrocyte sedimentation rate) and random blood sugar. Tuberculin skin test (TST) was performed in all cases. Skin responses were evaluated 48 hours after application, with a transverse diameter of 10 mm induration being judged as a positive reaction. To detect a pulmonary manifestation, all subjects underwent chest radiographs and sputum analysis. Definitive diagnosis was established by histopathological, bacteriological and radiological methods. Ultrasound features showing confluent mass, central necrosis and loss of fatty hilum were suspected to have Tuberculosis. Fine needle aspiration cytology (FNAC) and lymph node excisional biopsy were used to investigate peripheral lymph nodes. Lesions showing caseous granulomatous inflammation or the presence of acid-fast bacilli were diagnosed as Tuberculosis. Microbiological diagnosis using CBNAAT (cartridge based nucleic acid amplification test) was performed on tissue samples wherever possible. Cases which were detected to have TB lymphadenitis based on above tests were taken into the study.

Follow up:

After diagnosis, all patients were started on a standard short-term chemotherapy course (daily regimen, directly observed treatment short course) consisting of Isoniazid, Rifampicin, Pyrazinamide and Ethambutol in intensive phase for 2 months and Isoniazid, Rifampicin, Ethambutol for 4 months in continuation phase. Patients were followed up every month for treatment responsiveness. Most of the cases (79.1%) showed a decrease in size of lymph nodes. However, 5 cases (20.8%) showed an increase in size of lymph nodes. These cases were subjected to excision biopsy followed by CBNAAT which were negative and ruled out any resistance to Rifampicin. Data was statistically analysed using the statistical package for social sciences (SPSS) version 25 for MS Windows.

RESULTS

24 cases of lymph node TB included significantly higher females, 83.3% ($p=0.02$). Mean age of overall subjects was 32.6 ± 15.24 years. (Table 1) Mean age among males was 37 ± 15.59 years and among females was 31.75 ± 15.24 years, suggesting that lymph node Tuberculosis was more common in younger age groups and in females. 8.3% belonged to <20 years of age, 50% belonged to 20-30 years of age, 12.5% each belonged to 30-40 years, 40-50 years and 50-60 years, 4.1% belonged to >60 years of age. 58.3% were from rural areas and 41.7% were from urban areas. Most of them were either labourers (37.5%) or housewives (25%). None of them were smokers, only one person was alcoholic and one was a tobacco chewer. However, 25% of subjects gave a history of passive smoking and 45.8% had exposure to biomass fuel exposure. 8.3% had a past history of TB.

| Parameter | N (%) |
|------------------------|------------------|
| Age (years) | 32.6 ± 15.24 |
| Females | 20 (83.3) |
| Males | 4 (16.6%) |
| Comorbidities | |
| Diabetes mellitus | 1 (4.1) |
| HIV-AIDS | 1 (4.1) |
| Chronic kidney disease | 1 (4.1) |
| Hypertension | 2 (8.2) |

Table 1: Demographics characteristics among study subjects

All of them presented with a history of swelling, out of which 79.1% had cervical swelling and 20.8% had axillary swelling. (Table 2) 83.3% had multiple lymph nodes, while the nodes were solitary in 16.7%. 33.3% showed matting and fixity of the nodes to surrounding structures. None of the patients showed skin changes and sinus formation. Main symptoms among the subjects were fever (37.5%), loss of appetite (50%) and loss of weight (54.1%). Among those subjects who had fever, more than half of them (55.5%) had fever for a duration of 1-4 weeks. 58.3% of subjects with loss of appetite had the symptom for a duration of 1-4 weeks. 61.5% of subjects with weight loss had the symptom for a duration of 1-4 weeks. (Table 2) One patient each had Diabetes, chronic kidney disease, HIV-AIDS and two patients had a history of hypertension. (Table 1)

The ESR was raised in all but two cases and was a useful index during follow-up. It was between 20-50 mm/hr in 50% of cases, between 50-100 mm/hr in 20.8% of cases and more than 100 mm/hr in 20.8% of cases. The Mantoux test was positive in 70.8% of cases with a transverse diameter of 10 mm induration. Associated pulmonary lesions like pleural effusion and fibrosis were detected in three cases only. However, sputum AFB and CBNAAT were negative in all cases.

The diagnosis was established by FNAC in 84% of cases and by HPE in 20.8% of cases, in few cases, both the tests were performed. (Figures 1 and 2) 58.3% of cases showed features of Tuberculosis on radiological examination using Ultrasonography. All cases were started on standard short course chemotherapy, of which 87.5% completed treatment and 12.5% (3 cases) were lost to follow up. 79.1% showed improvement after treatment, one subject had suffered adverse effects due to treatment and one subject died due to underlying chronic kidney disease during the course of the treatment. 20.8% showed an increase in size of the lymph nodes after initiation of ATT whereas the remaining 79.1% showed a decrease in the size of lymph nodes.

| Parameters | N (%) |
|---------------------|-----------|
| Swelling | 24 (100) |
| Fever | 9 (37.5) |
| Loss of appetite | 12 (50) |
| Loss of weight | 13 (54.1) |
| Tenderness | 5 (20.8) |
| Sinuses | 0 |
| Skin changes | 0 |
| Site of involvement | |
| Cervical | 13 (54.1) |
| Axillary | 5 (20.8) |
| Inguinal | 0 |
| Single | 4 (16.6) |
| Multiple | 20 (83.3) |
| Matted | 8 (33.3) |
| Non-matted | 16 (66.6) |
| Past history of TB | 2 (8.3) |
| Treatment outcomes | |
| Improved | 19 (79.1) |
| Loss to follow up | 3 (12.5) |
| Adverse effects | 1 (4.1) |
| Death | 1 (4.1) |

Table 2: Clinical characteristics and treatment outcomes of study subjects

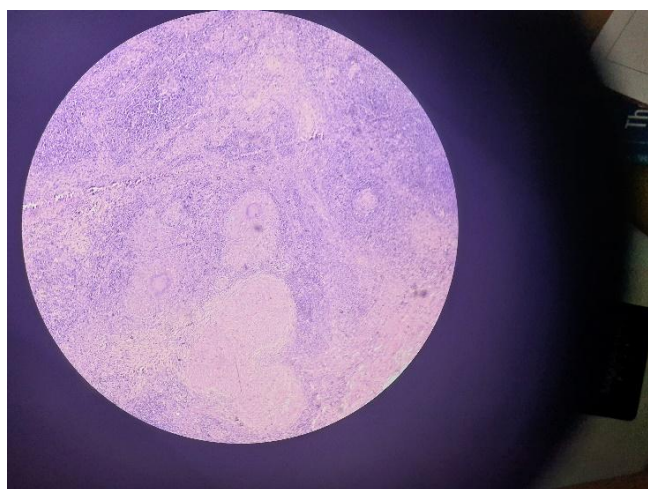


Figure 1: Low power view of section from lymph node from one of the study subjects showing multiple granulomas composed of central caseous necrosis (H & E, X10)

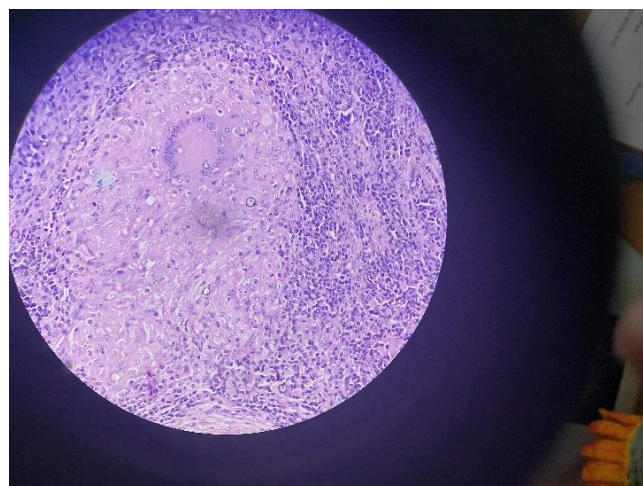


Figure 2: High power view of a section from a lymph node from one of the study subjects showing Langhans giant cell with caseous necrosis with epithelioid histiocytes rimmed by lymphocytes and fibrous tissue (H & E, X40)

DISCUSSION

Peripheral lymph node Tuberculosis is the most common form of extrapulmonary Tuberculosis. Its incidence in Asia and Africa has not decreased even though there has been an improvement in standard of living in these populations. [7] As reported by others (68.3% in a study by Henning et al. [8] 74% in a study by Khandkar et al. [9]), female preponderance was noted in our study (83.3%). [7] This may be due to the fact that females have a low nutritional status, [10] have hormonal changes [11] and are exposed to overcrowding more than males. Also, females are more conscious of their appearance and may present early. [7]

Peak age is considered to be 20-40 years of age, as seen in our study (62.5%). [7], [12] Higher Tuberculin skin test positivity in our study of 70.8% was also seen in a study published by Yashveer and Kirti et al. [13]

The present study showed the predominance of cervical lymph node TB when compared to other peripheral sites. This could be the result of the tonsils, adenoids and Waldeyer’s ring providing an easy portal of entry to Mycobacteria. [12] The portal of entry is by inhalation and deposition of *M.tuberculosis* in the pharyngeal wall leading to cervical lymph node involvement. [14] Also, there are enriched lymphatics in the cervical region and are in close communication with the pulmonary system. [15] Multiple lymph nodes were noted in our study in the majority of the cases (83.3%) compared to 80.5% of solitary lymph nodes in a study by Gupta et al. [10] Ultrasonogram in tubercular lymphadenitis, which was done in all our subjects, is described to detect features of involvement of multiple nodes with a tendency toward fusion. [16]

Standard 6-month regimen (National Tuberculosis elimination programme for drug sensitive TB) was followed as most guidelines recommend the same regimens as for

Pulmonary TB.^[10]After initiation of ATT, 79.1% showed decrease in size of lymph nodes. 5 cases showed an increase in size of lymph nodes, which were subjected to excision biopsy followed by CBNAAT which were negative and ruled out Tuberculosis, indicating successful treatment outcome using standard ATT.

CONCLUSION

TB lymph nodes remain a major cause of Extrapulmonary Tuberculosis in India, especially in rural parts. There was a preponderance of peripheral lymph node TB among females and in the 20-40 years of age group. The most common site involved was the cervical region, followed by the axillary region. Ultrasonography detects multiple lymph nodes with the presence of matting. A standard 6-month ATT regimen was sufficient for successful treatment outcomes.

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