



SPECTRUM OF CUTANEOUS TUBERCULOSIS: A CASE SERIES FROM A TERTIARY CARE CENTRE IN TRIBAL AREA.

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Abstract

Background: Cutaneous tuberculosis (CTB) is a rare extrapulmonary manifestation of tuberculosis caused primarily by *Mycobacterium tuberculosis*. It accounts for approximately 1.5–3% of all tuberculosis cases and remains an important diagnostic challenge, particularly in resource-limited and tribal populations. **Materials and Methods:** This observational study was conducted in the Department of Dermatology, Venereology and Leprosy at a tertiary care centre in Northern Telangana in tribal area from November 2023 to March 2025. Patients diagnosed with CTB based on clinical findings, CB- NAAT, culture, and/or histopathology were included. All patients underwent routine hematological, serological, radiological, and immunological investigations. Ultrasonography-guided FNAC was performed where indicated. Patients received standard anti-tubercular therapy (ATT) under the national tuberculosis program. **Results:** Nine patients were diagnosed with CTB over 17 months. The age ranged from 5 to 60 years with a male-to-female ratio of 7:2. Lesions predominantly involved the face, neck, and chest, with cervical lymphadenopathy being the most common nodal involvement. Six patients completed standard ATT with complete clinical resolution. One patient succumbed to meningitis shortly after diagnosis. Two atypical chronic non-healing lower limb lesions, associated with prolonged intralesional steroid use, showed significant improvement after initiation of ATT. **Conclusion:** Cutaneous tuberculosis remains uncommon but clinically significant in tribal populations. Scrofuloderma was the predominant presentation, with strong Mantoux reactivity and favourable response to standard ATT. The presence of steroid-associated and atypical lesions highlights the need for high clinical suspicion, particularly in chronic non-healing ulcers. Early diagnosis using CB-NAAT and histopathology facilitates timely management and prevention of systemic complications.

Keywords: Cutaneous tuberculosis; Scrofuloderma; Extrapulmonary tuberculosis; CB-NAAT; Histopathology; Anti-tubercular thera.



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INTRODUCTION

Tuberculosis (TB) is a chronic granulomatous infection caused primarily by *Mycobacterium tuberculosis* (Mtb). It has a global distribution, with a higher prevalence in developing countries. Cutaneous tuberculosis (CTB) is a rare extrapulmonary manifestation, comprising only 1.5% to 3% of TB cases.¹ China, India, and Indonesia together account for 45% of global TB cases. The Southeast Asia and African regions contribute to 85% of all TB-related deaths worldwide, highlighting the disproportionate disease burden in these areas.² In India, the prevalence of childhood skin TB has been reported to be 18.7% of all cases of skin TB in Chandigarh, 20.4% in Varanasi, 24.41% in Chennai and higher prevalence ranging from 31.7% to 53.9% in recent case series from Delhi.³ The primary causative agent of cutaneous tuberculosis is *Mycobacterium tuberculosis*. Less commonly, it may arise from *Mycobacterium bovis* or the BCG vaccine strain (attenuated *M. bovis*). *M. tuberculosis* is a non-motile, non-sporulating, not encapsulated, rod-shaped bacillus (1–10 µm long, 0.2–0.6 µm wide). It is acid-fast, retaining red fuchsin stain despite exposure to acid-alcohol. The cell wall is rich in lipids, providing chemical resistance, though it remains vulnerable to heat and UV radiation.⁴

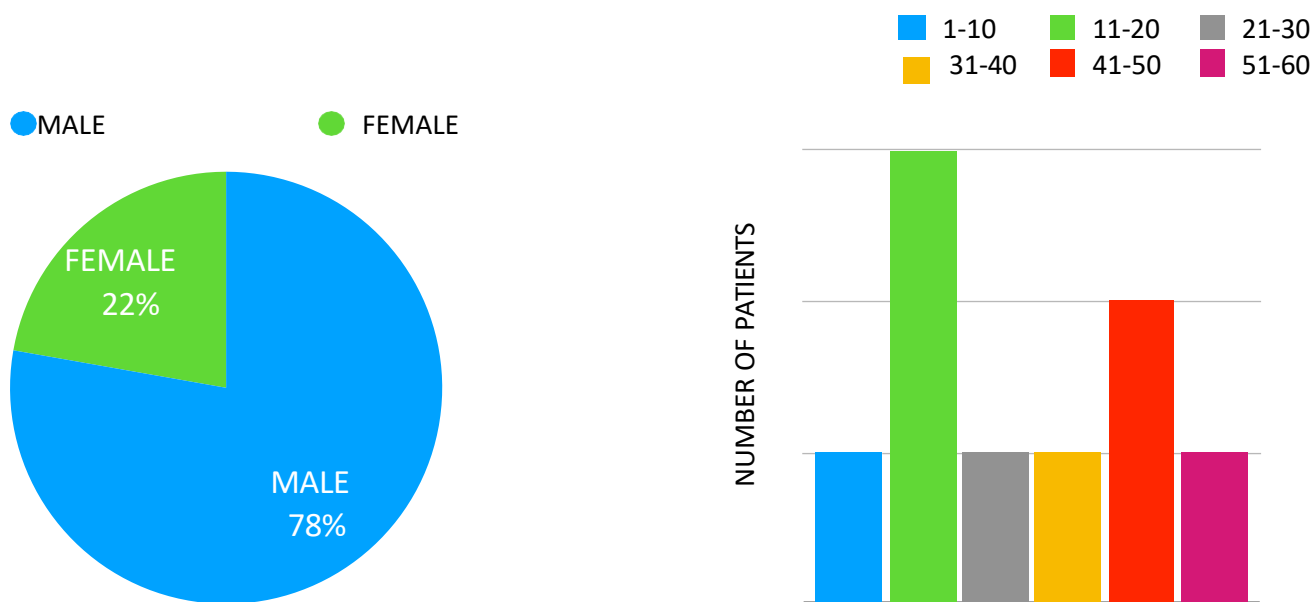
MATERIALS AND METHODS

The study was conducted at a tertiary care centre situated in tribal area in Northern Telangana in the Department of Dermatology, Venereology and Leprosy from Nov 2023 to March 2025. Patients diagnosed with cutaneous tuberculosis by clinical features, culture for *Mycobacterium tuberculosis*/ cartridge-based nucleic acid amplification test (CB-NAAT) were evaluated. The medical records consisted of investigation reports and post-treatment clinical images taken routinely along with written informed consents from each patient or their guardians accordingly. Detailed diagnostic evaluation of these patients included routine blood investigation (complete blood count, liver function test, renal function test, blood sugar, erythrocyte sedimentation rate), viral makers for hepatitis B and C viruses and human immunodeficiency virus, routine urine analysis, Mantoux test. Radiological investigations included chest x-rays, CT scan and abdominal ultrasonography as indicated. All patients received anti-tubercular treatment (ATT) from district tuberculosis centre.

RESULTS

A total of nine patients suffering from cutaneous tuberculosis were found. The youngest patient among nine cases was five years and oldest being 60 years. Male to female ratio was found to be 7:2. Sites of lesions involved were predominantly around neck, chest and face in 7 patients and two patients had their lesions on lower limbs. On palpation lymph nodes were multiple, matted with predominantly involving cervical region, followed by axilla in 6 cases. For one patient lesions were present on face, neck but no regional lymphadenopathy was noted. Two cases had lesions around legs with no regional lymphadenopathy. No involvement of inguinal lymph nodes was noted.

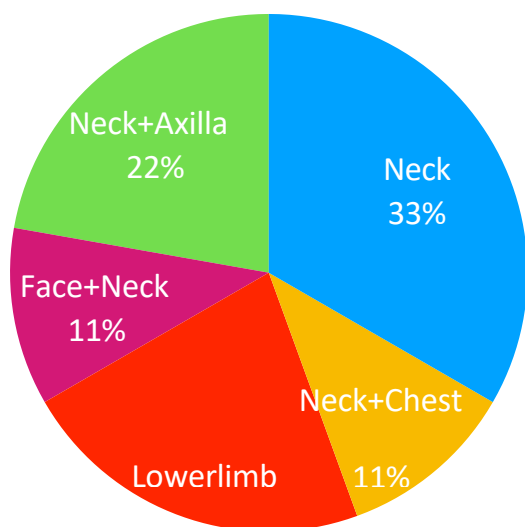
Patients were advised routine investigations including complete blood picture, liver function test, renal function test, RBS, ESR which all were within normal limits. Viral status (HIV, Hep B, C) of all patients was also negative. Mantoux test was done which was positive in all cases with induration more than 15mm in all. Bacterial culture done from pus from the lesions did not reveal any growth of organism. Along with bacterial cultures, CBNAAT was done which was positive in 7 out of 9 cases with none showing rifampicin resistance. Chest X ray was done in all patients which was normal. Ultrasonography of lesions was done which showed features consistent with infective/ koch's etiology. Under usg guidance FNAC was performed from the lesions which revealed caseating granulomas in 7 out of 9 cases. Based on the above features, 6 patients were started on antitubercular drugs with HRZE regimen in intensive phase for 2 months and HRE in continuous phase for 4 months which resulted in complete cure. One patient died of meningitis within four days of diagnosis. Other two cases for which lesions were on legs which were secondary to prolonged high doses of intralesional steroids as a treatment option for prurigo nodularis (male) and heel pain due to calcaneal spur (female), were chronic and non healing to any topical and systemic antibiotics, so were given a trail of ATT for 6weeks after which lesions started improving so complete course of ATT was given which showed promising results.



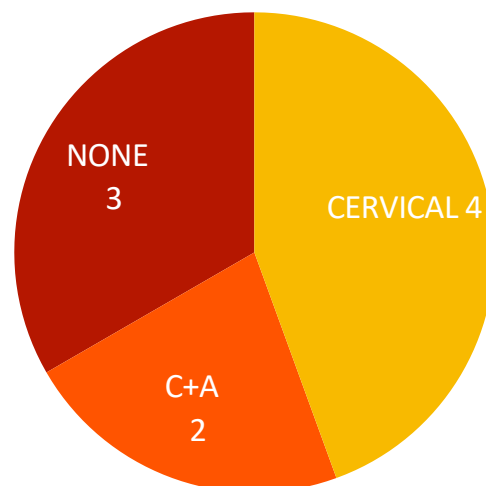
Pie diagram showing gender distribution

Bar diagram showing age distribution

● CERVICAL ● AXILLARY
● INGUINAL ● NONE ● C+A

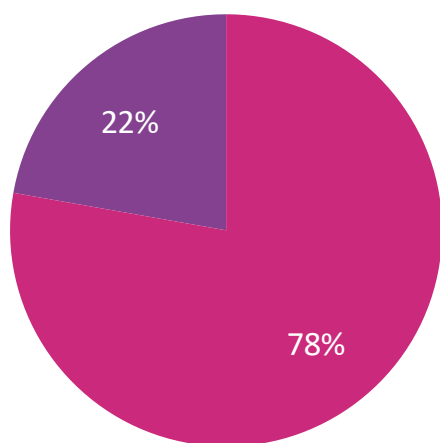


Pie chart showing site of lesions



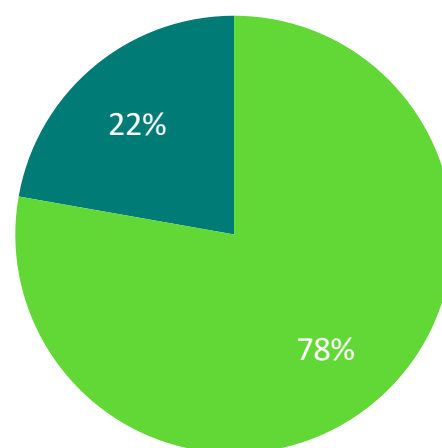
Pie chart showing site of lesions

● Positive ● Negative

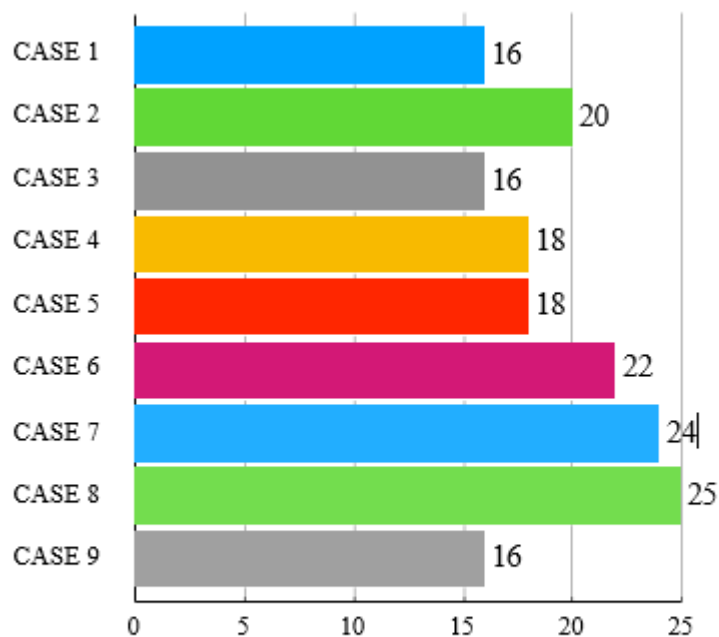


Pie chart showing CBNAAT results

● Positive ● Negative



Pie chart showing FNAC RESULTS



Bar chart showing MANTOUX TEST [results in mm]

CASE 1: A 5-yr old male child with scrofuloderma pre treatment and post treatment after ATT



CASE 3: 43 yr old male with scrofuloderma on neck and chest pre treatment and post ATT



CASE 4: 13 yr old male with lesions on right heel which resolved after treating with ATT for 6months.



DISCUSSION

Tuberculosis (TB) remains a persistent global health concern, with cutaneous tuberculosis (CTB) forming a small but clinically significant subset of total TB cases. Despite its relatively low prevalence, early and accurate recognition of CTB is crucial to avoid misdiagnosis and treatment delays. 5,6 Cutaneous tuberculosis can develop through different pathogenic mechanisms. Exogenous infection occurs when MTB directly enters the skin, leading to lesions such as tuberculous chancre or tuberculosis verrucosa cutis. Endogenous spread may occur by contiguous extension causing scrofuloderma and orificial tuberculosis, hematogenous dissemination resulting in miliary tuberculosis, tuberculous gumma, or lupus vulgaris, and lymphatic spread contributing to lupus vulgaris. 6 Among these forms, scrofuloderma and lupus vulgaris are most commonly encountered in endemic regions like India.5,7

Compared to significant long-term studies that reported 52 CTB cases over three years in Central India 7 and 30 cases over thirty months in South Rajasthan 8, our 17-month study found a total of 9 cases of cutaneous TB. This emphasizes the relative rarity of CTB and increases the risk of underdiagnosis in resource-constrained environments and tribal populations. However, rather than a true lower prevalence, the smaller population and restricted access to healthcare in tribal areas are likely the reasons for the lower number of cases in our study.

In our study, 2 of 9 patients were children and 7 were adults, with 7 cases of scrofuloderma and 2 probable inoculation-type lesions. Most were young adults in the Central India series, and the most common type was lupus vulgaris, which was followed by scrofuloderma. 7 The South Rajasthan series also featured a large number of young adults, but the most common type was scrofuloderma, followed by lupus vulgaris. 8 Over half of the 1458 Indian patients in the largest cohort were children, and lupus vulgaris once more predominated, followed by scrofuloderma and a number of other forms.5 Our cohort differs from the three studies in that it has two likely inoculation-type cases, has fewer children, no classical lupus vulgaris, and is more biased toward scrofuloderma.

Seven out of nine cases in our study had lesions on the face, neck, and chest, with two cases affecting the lower limbs. This outcome is in line with additional Indian data that indicates the head and neck are the most frequently affected areas for CTB. 5 Cervical lymph nodes, which were numerous and matted, were most frequently involved, followed by axillary nodes without any inguinal involvement. The South Rajasthan cohort showed that 60% of cases involved the head and neck 8, and the Central India study also showed that the face and neck were common sites.7 This pattern also reflects the most prevalent nodal involvement in TB data, which is cervical tuberculous lymphadenitis.

Mantoux test was strongly positive (induration more than 15 mm) in all nine patients in contrast to the 56.7% positivity found in South Rajasthan 8 and varying reactivity noted in other studies. This consistently strong Mantoux result in our cohort indicates that cell-mediated immunity is intact, due to the relatively early detection.

Pus cultures were sterile, while CB-NAAT from tissue or exudate was positive in most cases

without detecting rifampicin resistance indicating the paucibacillary nature of cutaneous tuberculosis and the low sensitivity of smear and culture. Histopathology and imaging supported an infective etiology, with ultrasound-guided FNAC frequently demonstrating caseating granulomas, consistent with other Indian studies which had clinicopathological correlation. Previous studies in resource limited settings relied on clinicopathological correlation and therapeutic response to ATT because molecular testing was unavailable. In contrast, the present findings emphasize the growing role of molecular techniques such as

CB-NAAT (GeneXpert) and line probe assays, which allow rapid detection of *Mycobacterium tuberculosis* and simultaneous identification of drug resistance even in paucibacillary specimens.⁹

Our cohort's treatment patterns and results were consistent with those of larger studies. Six patients were completely clinically cured after receiving standard HRZE for two months and HRE for four months as part of the national TB program. The Central India series also showed excellent responses to ATT regimen 7, and the large 1,458-patient cohort reported positive treatment outcomes in 99.2% of cases using standard ATT. 5 One of our patients passed away from meningitis four days after receiving a diagnosis of CTB, in contrast to many other studies that hardly ever discuss mortality. This underscores the dangers of systemic spread and involvement of the central nervous system, as well as the necessity of carefully assessing potential extracutaneous sources.

Our series identified two atypical chronic non-healing leg lesions at sites of prolonged intralesional steroid injections that were unresponsive to antibiotics but resolved with ATT, suggesting CTB unmasked by local steroid-induced immunosuppression; such injection-site CTB is rarely reported in major series focused on classical forms.

CONCLUSION

This study highlights that cutaneous tuberculosis, though rare, continues to present diagnostic and therapeutic challenges in tribal and resource-limited settings. Strong Mantoux positivity and caseating granulomas on FNAC supported intact cell-mediated immunity and clinicopathological correlation. The incorporation of CB-NAAT significantly enhanced diagnostic confirmation and ruled out drug resistance, underscoring its growing importance in CTB evaluation. Standard anti-tubercular therapy resulted in favourable outcomes in most cases. The occurrence of CTB in sites of prolonged intralesional steroid injections further stresses the role of local immunosuppression as a potential precipitating factor. A high index of suspicion, especially in chronic non-healing lesions unresponsive to conventional therapy, is essential for early diagnosis and effective treatment.

Overall, demographic factors, healthcare accessibility, and local practices may influence the clinical spectrum of CTB, reinforcing the importance of region-specific clinical awareness.

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