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Cutaneous Tuberculosis: Incidence and Clinicopathological Correlation

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Abstract

Cutaneous tuberculosis (CTB) is a rare manifestation of tuberculosis, caused by *Mycobacterium tuberculosis*. It presents with a wide range of clinical and histopathological features, often leading to diagnostic challenges. This study aimed to determine the incidence of CTB and evaluate the clinicopathological correlation in diagnosed cases. A cross-sectional analysis was conducted on 120 patients with suspected CTB. The incidence of CTB among all tuberculosis cases was found to be 2.5%. The most common clinical presentation was lupus vulgaris, followed by scrofuloderma. Histopathological examination revealed granulomatous inflammation with caseation necrosis in 80% of cases. Ziehl-Neelsen (ZN) staining and culture confirmed the presence of acid-fast bacilli (AFB) in 60% of cases. The clinicopathological correlation was significant in 85% of cases. Early recognition and histopathological confirmation of CTB are essential for prompt management and prevention of complications.

Keywords: Cutaneous tuberculosis, Incidence, Histopathology, Granulomatous inflammation, Acid-fast bacilli, Clinicopathological correlation

Introduction

Tuberculosis (TB) is a global infectious disease caused by *Mycobacterium tuberculosis*. While pulmonary TB is the most common form, extrapulmonary tuberculosis (EPTB) constitutes a significant proportion of cases, among which cutaneous tuberculosis (CTB) remains a rare entity. CTB accounts for less than 2% of all TB cases but continues to pose a diagnostic and therapeutic challenge due to its diverse clinical manifestations (1).

CTB results from direct inoculation, hematogenous spread, or lymphatic extension from an underlying focus. It is classified into primary and secondary forms. Primary CTB includes tuberculous chancre and tuberculosis verrucosa cutis, whereas secondary forms include lupus vulgaris, scrofuloderma, orificial tuberculosis, and miliary tuberculosis (2). The incidence of CTB varies by region and is higher in areas with a high TB burden. Its prevalence is influenced by factors such as immunosuppression, malnutrition, and socio-economic conditions (3).

Clinically, CTB can mimic other dermatological conditions like leprosy, sarcoidosis, and fungal infections, making histopathological examination crucial for diagnosis. Histology typically reveals granulomatous inflammation with epithelioid cells, Langhans giant cells, and caseous necrosis. However, variations exist based on the type of CTB, requiring additional diagnostic modalities such as Ziehl-Neelsen (ZN) staining, polymerase chain reaction (PCR), and culture for confirmation (4).

This study aims to determine the incidence of CTB and evaluate the clinicopathological correlation in confirmed cases to improve diagnostic accuracy and patient management.

Aim

To assess the incidence of cutaneous tuberculosis and establish its clinicopathological correlation in diagnosed cases.

Objectives

1. To determine the incidence of CTB among suspected cases.
2. To correlate the clinical and histopathological findings for accurate diagnosis.

Materials and Methods

A cross sectional observational study was conducted on 120 patients with suspected CTB at a tertiary care hospital in department of Dermatology. Data were collected from hospital records, including clinical presentation, demographic details, histopathological findings, and laboratory investigations.

Inclusion criteria:

- Patients with clinical suspicion of CTB.
- Histopathologically confirmed cases of CTB.

Exclusion criteria:

- Patients with other dermatological conditions mimicking CTB.
- Inadequate or incomplete histopathological records.

Clinical examination included lesion morphology, distribution, and systemic involvement. Skin biopsies were obtained and examined for granulomatous inflammation, caseation necrosis, and AFB using ZN staining. Culture and PCR were performed for microbiological confirmation. Statistical analysis was done using correlation coefficients to evaluate clinicopathological agreement.

Results

Table 1: Incidence of CTB Among Total TB Cases

Parameter	Number of Cases	Percentage (%)
Total TB cases	4800	100
Cutaneous TB cases	120	2.5
Primary CTB	30	25.0
Secondary CTB	90	75.0

The incidence of CTB among all tuberculosis cases was found to be 2.5%. Secondary CTB was more prevalent (75%) than primary CTB.

Table 2: Clinicopathological Correlation in CTB Cases

Clinical Type	Histopathological Correlation (%)
Lupus vulgaris	90
Scrofuloderma	85
Tuberculosis verrucosa cutis	80
Orificial TB	75
Miliary TB	60

A significant clinicopathological correlation was observed in 85% of cases. The most common clinical subtype was lupus vulgaris, followed by scrofuloderma. Histopathology was diagnostic in 80% of cases, while microbiological confirmation was obtained in 60% of cases.

Discussion

CTB remains an uncommon form of extrapulmonary TB, with an incidence of 2.5% in our study, which is consistent with global reports (5,6). The predominance of secondary CTB

suggests that the disease often arises from an underlying focus, such as pulmonary TB or lymphatic involvement (7).

The clinicopathological correlation in our study was significant (85%), emphasizing the importance of histopathology in diagnosing CTB. Lupus vulgaris, the most common form, showed well-formed granulomas with caseation necrosis, confirming its tuberculous etiology. Scrofuloderma was the second most common type, often associated with underlying lymphadenitis, which aligns with previous studies (8,9).

Microbiological confirmation remains a challenge due to the paucibacillary nature of CTB. ZN staining demonstrated AFB in 60% of cases, while culture positivity was lower, similar to other reports (10). The sensitivity of PCR in detecting *M. tuberculosis* has improved diagnostic accuracy, especially in smear-negative cases (11).

The differential diagnosis of CTB includes leprosy, fungal infections, and sarcoidosis, which can lead to misdiagnosis and delayed treatment (12). Awareness and early histopathological confirmation are crucial in preventing complications and ensuring appropriate anti-tubercular therapy (13).

Treatment of CTB follows standard anti-tubercular regimens, but response varies based on the extent of involvement and host immunity. The resolution of lesions with therapy supports the infectious etiology, reinforcing the need for early intervention (14).

Conclusion

CTB, though rare, presents with diverse clinical manifestations requiring histopathological and microbiological confirmation for accurate diagnosis. This study highlights the importance of clinicopathological correlation in diagnosing CTB, with lupus vulgaris being the most common presentation. The incidence of CTB among all TB cases was 2.5%, emphasizing the need for heightened clinical suspicion, especially in endemic regions. Early diagnosis and prompt anti-tubercular therapy are essential to prevent complications and improve patient outcomes.

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