



Diagnostic Accuracy of Microbiological and Pathological Techniques in Leprosy: A Retrospective Study from Coastal Karnataka

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Abstract

Introduction: Leprosy, or Hansen's disease, remains a public health concern despite the success of multidrug therapy (MDT) in reducing its global prevalence. Accurate diagnosis necessitates a multidisciplinary approach, integrating clinical, microbiological, and pathological techniques. Slit-skin smears aid in confirming *Mycobacterium leprae*, while histopathological analysis facilitates classification and staging. This study evaluates the diagnostic efficacy of microbiological and pathological techniques in a tertiary care hospital in coastal Karnataka.

Methods: A retrospective hospital-based study was conducted from January 2022 to June 2024 in the Department of Microbiology following ethical clearance. Clinically diagnosed or suspected leprosy patients of all ages and genders were included. Slit-skin smears for acid-fast bacilli (AFB) were examined using the modified Ziehl-Neelsen staining method, with bacteriological and morphological indices calculated. Skin biopsies were processed using formalin fixation and Hematoxylin and Eosin staining, with lesions classified per the Ridley-Jopling system.

Results: Among 111 cases (age range 9–74 years, male predominance), borderline tuberculoid (36%) was the most common subtype. Histopathological confirmation was achieved in 78 cases, with the highest clinico-histopathological and microbiological correlation observed in borderline tuberculoid cases. The bacterial index ranged from 1+ to 6+, with lepromatous leprosy showing the highest values. Correlation between microbiology and histopathology was observed in 68 cases.

Conclusion: Microbiological and pathological integration enhances leprosy diagnosis, particularly for early and atypical lesions. The bacteriological index provides crucial disease burden insights, guiding classification and treatment. This combined approach improves patient care and contributes to global eradication efforts.

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Cite as: V Sindhuja, F Sneha kukanur, Avija, A. kumar, & K Ashwini. Diagnostic Accuracy of Microbiological and Pathological Techniques in Leprosy: A Retrospective Study from Coastal Karnataka. *Impact Surgery*, 2(3), 104. <https://doi.org/10.62463/surgery.165>