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An overview of Leprosy- Clinical Diagnosis and Management

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ABSTRACT :

Leprosy (Hansen's disease), caused by Mycobacterium leprae and Mycobacterium lepromatosis, remains a significant public health challenge in endemic regions. This chronic granulomatous disease primarily affects the skin and peripheral nerves, leading to progressive disability if untreated. Despite effective multidrug therapy (MDT), late diagnosis and management of reactions contribute to permanent nerve damage. This review consolidates current knowledge on leprosy classification, clinical features, diagnostic methods, and evidence-based treatment approaches. We emphasize the WHO-recommended MDT regimens, management of leprosy reactions (Type 1 and Type 2), and strategies for disability prevention. Recent advances in molecular diagnostics, immunotherapy, and novel drug regimens are also discussed. With ongoing transmission in high-burden countries, enhanced surveillance, early case detection, and community-based rehabilitation remain crucial for achieving global elimination targets.

1. Introduction

Leprosy is one of the oldest recorded diseases, yet it continues to affect vulnerable populations in tropical and subtropical regions. The introduction of MDT by WHO in 1982 revolutionized treatment, but diagnostic delays and stigma persist. Globally, over 200,000 new cases are reported annually, with India, Brazil, and Indonesia accounting for 80% of cases (WHO, 2022). This review provides an updated perspective on clinical diagnosis and management, incorporating recent research findings and WHO guidelines.

2. Clinical Classification and Features

The Ridley-Jopling system classifies leprosy based on clinical, histological, and immunological criteria:

2.1 Tuberculoid Leprosy (TT)

- Strong cell-mediated immunity
- 1-3 hypopigmented, aesthetic patches with well-defined borders
- Thickened peripheral nerves (e.g., ulnar, great auricular)

2.2 Borderline Forms (BT, BB, BL)

- Immunological instability
- Multiple asymmetric lesions (BT) to numerous bilateral lesions (BL)
- Gradual nerve damage

2.3 Lepromatous Leprosy (LL)

- Poor immune response
- Diffuse infiltration, nodules (leonine facies), systemic involvement
- Symmetric nerve thickening, testicular atrophy, ocular lesions

2.4 Indeterminate Leprosy

- Early stage with vague hypopigmented macules
- May resolve or progress to definitive forms

3. Diagnostic Approaches

3.1 Clinical Diagnosis

- Cardinal signs: Hypopigmented/erythematous patches with sensory loss, thickened nerves
- WHO operational classification (1-5 skin lesions = PB, ≥6 = MB)

3.2 Laboratory Diagnosis

- Slit-skin smear: Gold standard for MB cases (AFB detection)
- Histopathology: Granulomas (TT/BT), foamy macrophages (LL)
- Molecular tests: PCR for M. leprae DNA (useful in PB cases)
- Serological tests: Anti-PGL-1 antibodies (limited sensitivity)

4. Management Strategies

4.1 Multidrug Therapy (MDT)

Classification	Regimen	Duration
Paucibacillary (PB)	Rifampicin 600mg monthly + Dapsone 100mg daily	6 months
Multibacillary (MB)	Rifampicin 600mg + Clofazimine 300mg monthly + Dapsone 100mg + Clofazimine 50mg daily	12 months

4.2 Management of Reactions

- Type 1 (Reversal reaction): Prednisolone (1 mg/kg, tapered over 12-20 weeks)
- Type 2 (ENL): Prednisolone/thalidomide (for refractory cases)

4.3 Prevention of Disabilities

- Nerve function assessment (monitoring grip strength, sensory testing)
- Protective footwear, physiotherapy
- Reconstructive surgery for advanced deformities

5. Recent Advances

- Molecular diagnostics: CRISPR-based detection (Barbieri et al., 2021)
- Immunotherapy: BCG vaccination in contacts (Düppre et al., 2020)
- Novel drugs: Rifapentine, moxifloxacin trials (WHO, 2023)

6. Challenges and Future Directions

- Stigma, late presentations, and drug resistance
- Need for point-of-care diagnostic tools
- Integration with primary healthcare systems

7. Conclusion

Leprosy remains a neglected tropical disease requiring sustained efforts in early diagnosis, prompt MDT, and disability management. Community engagement and research into vaccines and better diagnostics are essential for elimination.

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