



Serum Zinc Levels in Leprosy Patients with ENL Reaction, Non-Reaction Controls, and Healthy Controls: A Comparative Study

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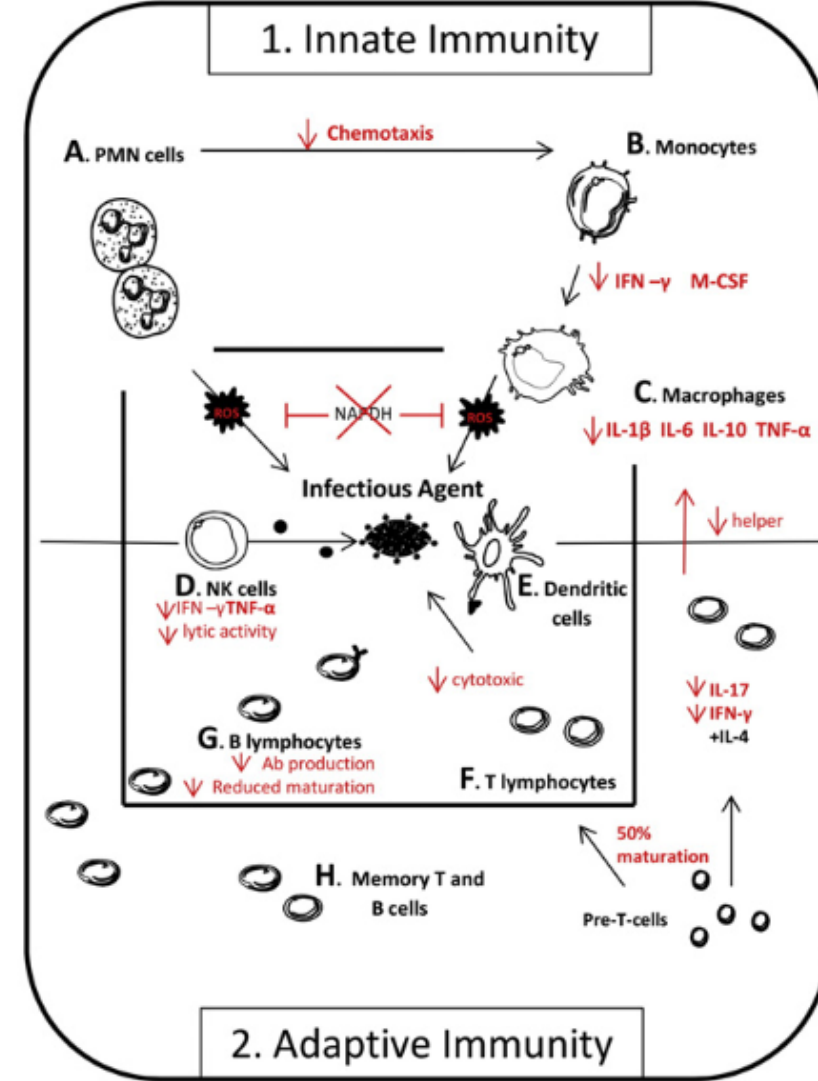
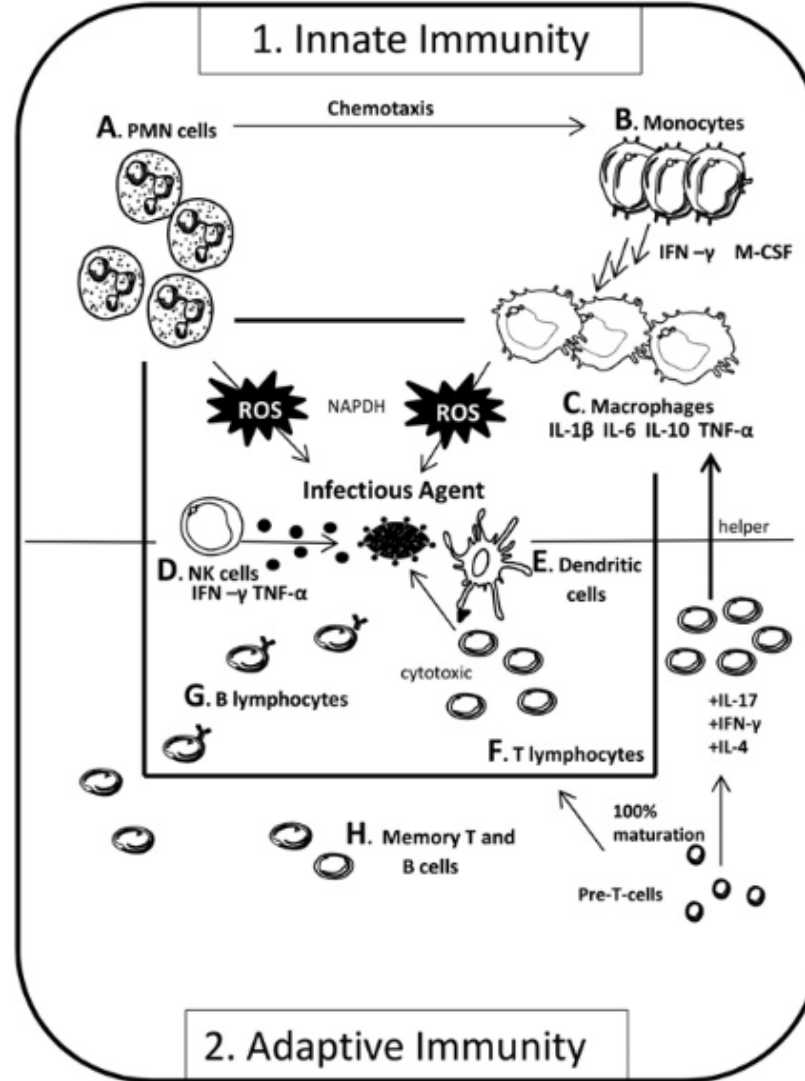
Background

- Leprosy is caused by *Mycobacterium leprae*, and the host immune response determines the clinical presentations of the disease.
- 20-50% of leprosy cases undergo inflammatory exacerbations before, during or even after MDT treatments in the form of type 1 (T1R) or type 2 (T2R, or Erythema Nodosum Leprosum, ENL) reactions.
- The knowledge on the pathophysiology of these leprosy reactions is limited.
- Zinc plays a crucial role in immune function and infection prevention.
- Zinc deficiency has been implicated in various immune dysfunctions, and its role in leprosy, particularly in reactional states, warrants investigation.

Normal immune system

VS

Zinc deficient immune system





Objective

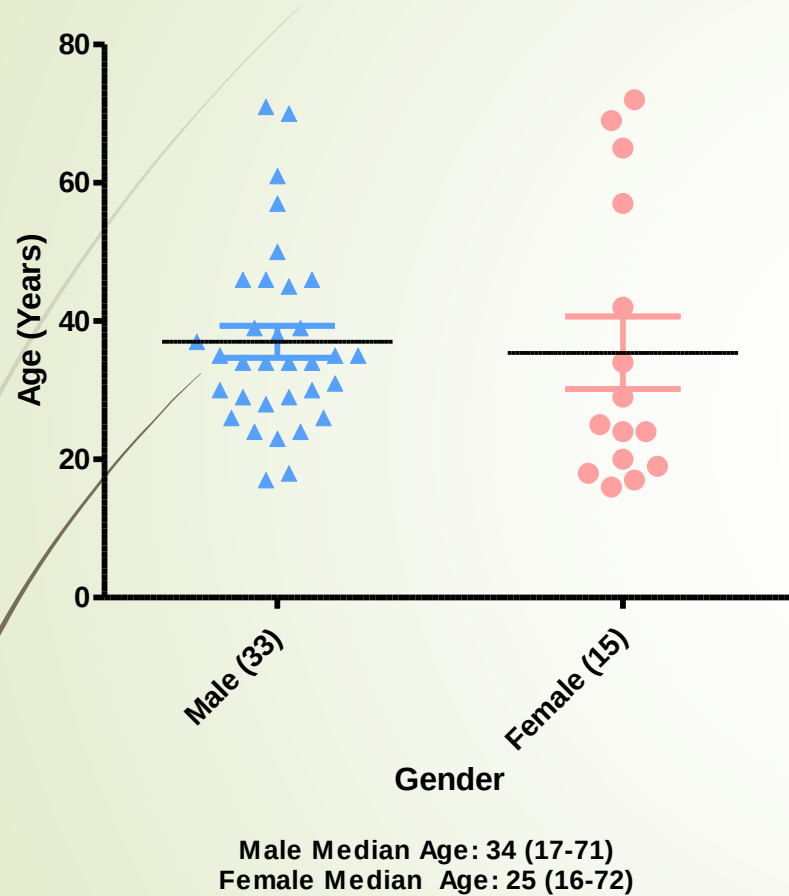
- The objective of this research is to assess the level of serum Zinc in Leprosy patients with Erythema Nodosum Leprosum (ENL) or Type 2 Reaction and compare it with Non-reactional leprosy patients and Healthy controls.

Methodology

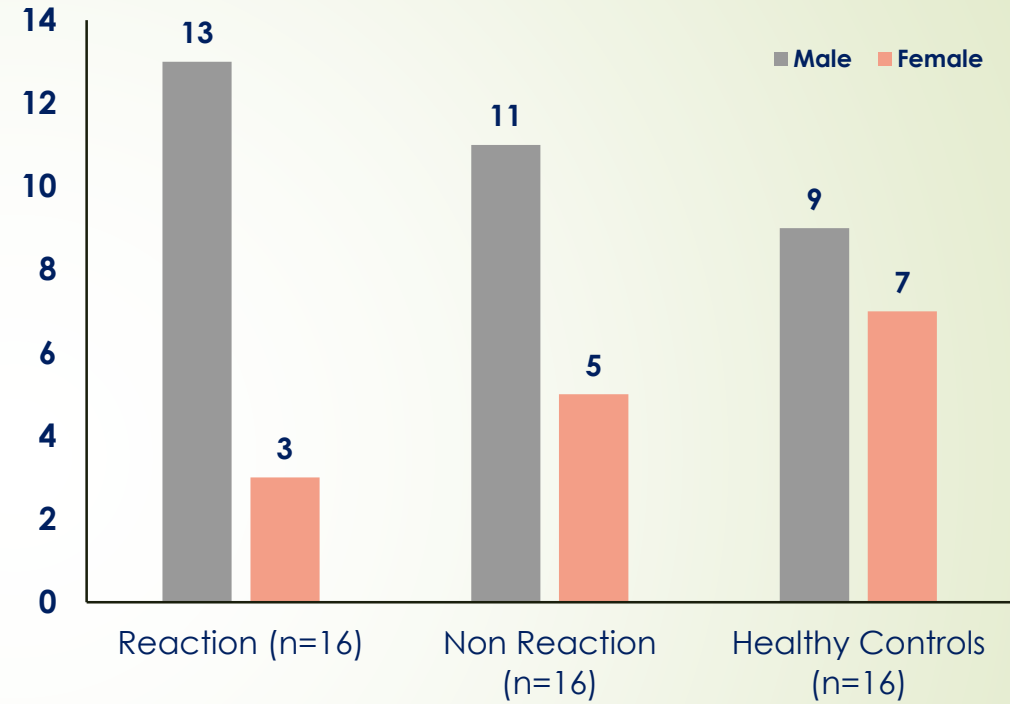
- Retrospective study (2022-2025) was designed to analyze the serum zinc levels in three groups: patients with leprosy experiencing ENL (n=16), non-reactional leprosy patients undergoing MDT treatment (n=16), and non-leprosy healthy controls (n=16).
- Blood samples from study participants were collected in metal-free vial and serum zinc levels (Reference range: 75-291 μ g/dL) were estimated using spectrophotometric technique.
- The median values for each group were calculated and compared.
- Data analysis included descriptive statistics and statistical tests to evaluate the differences between groups.

Results

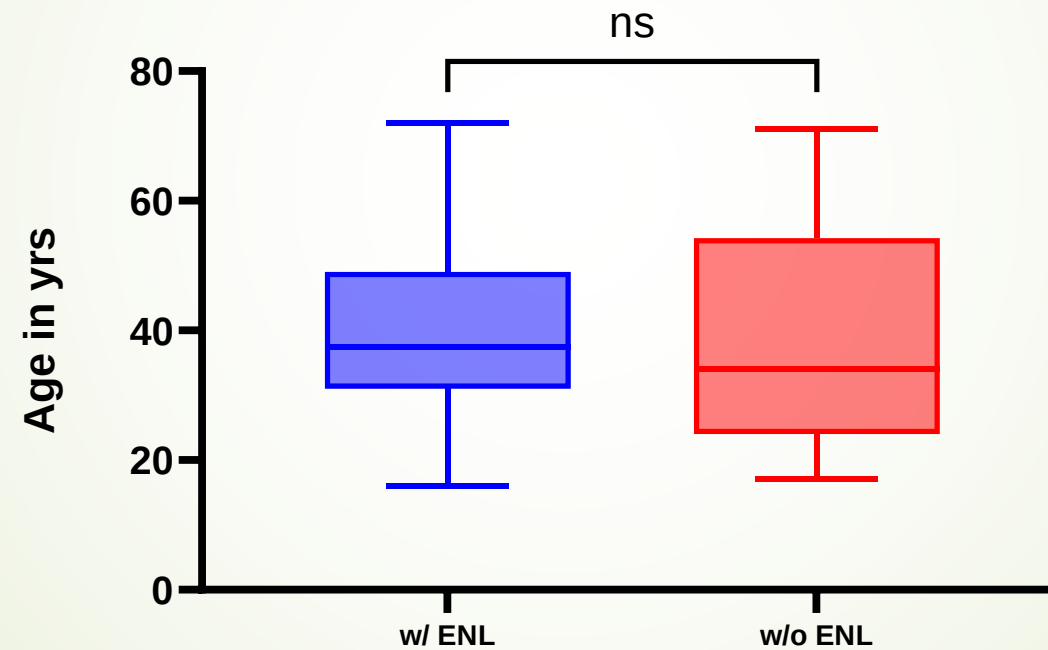
Age and gender distribution of study participants



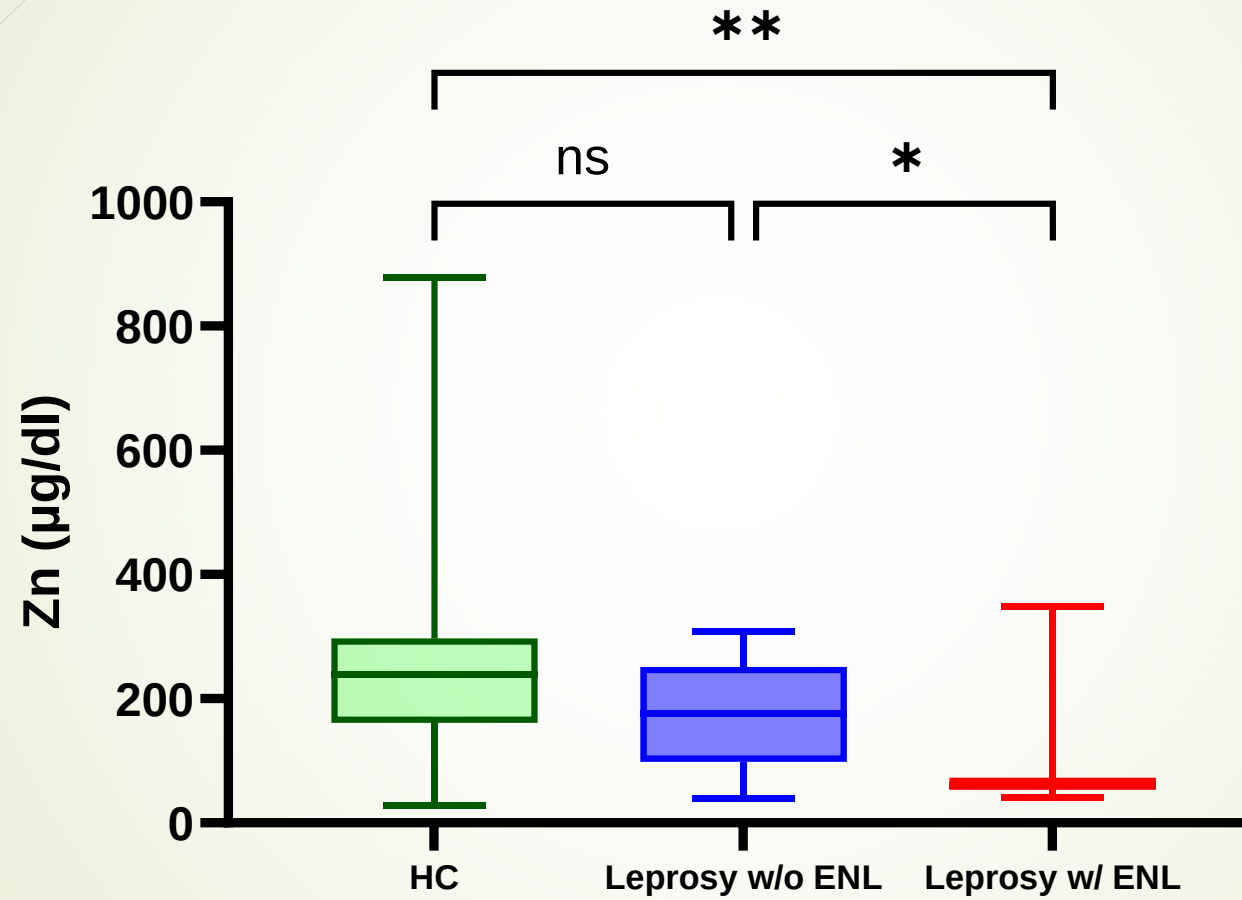
Gender Distribution in each study groups



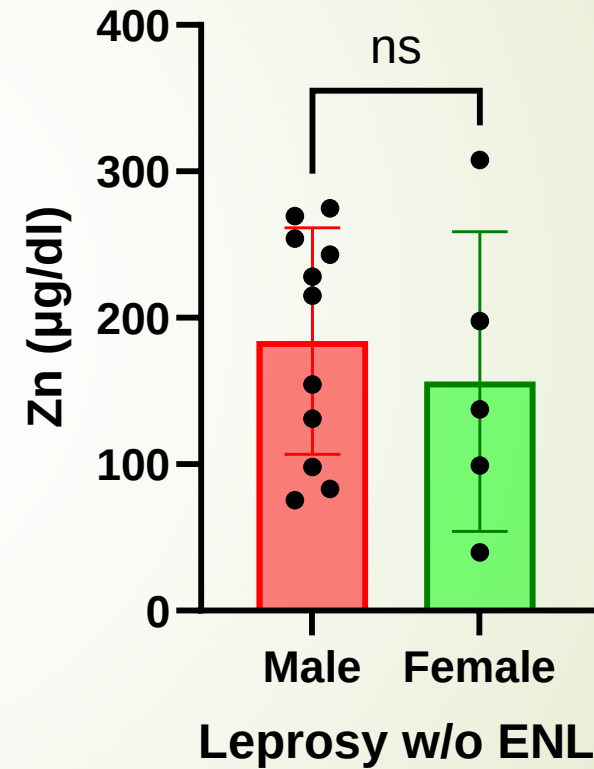
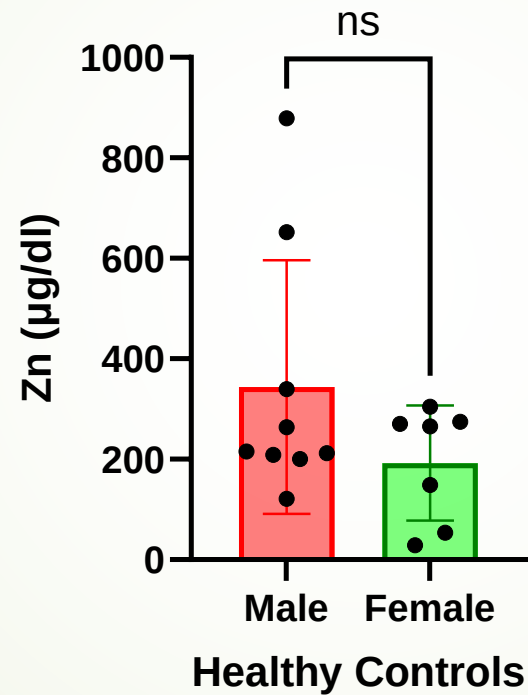
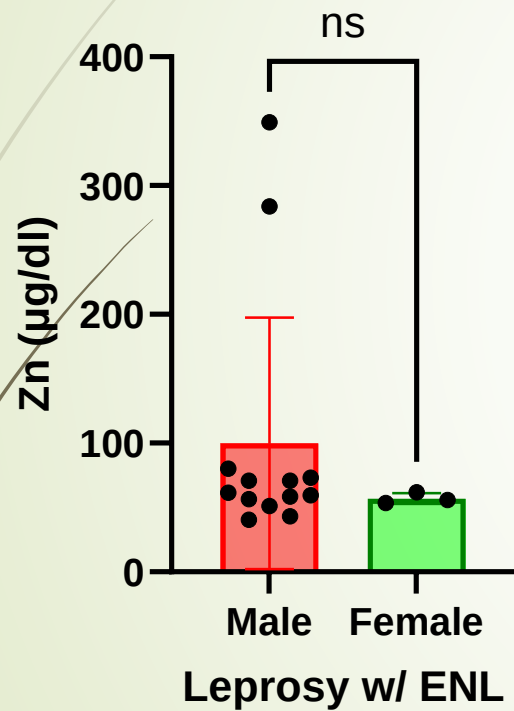
Distribution of Age in ENL vs non-ENL Leprosy patients



Comparison of serum Zn levels



Serum Zinc levels between Male and Females



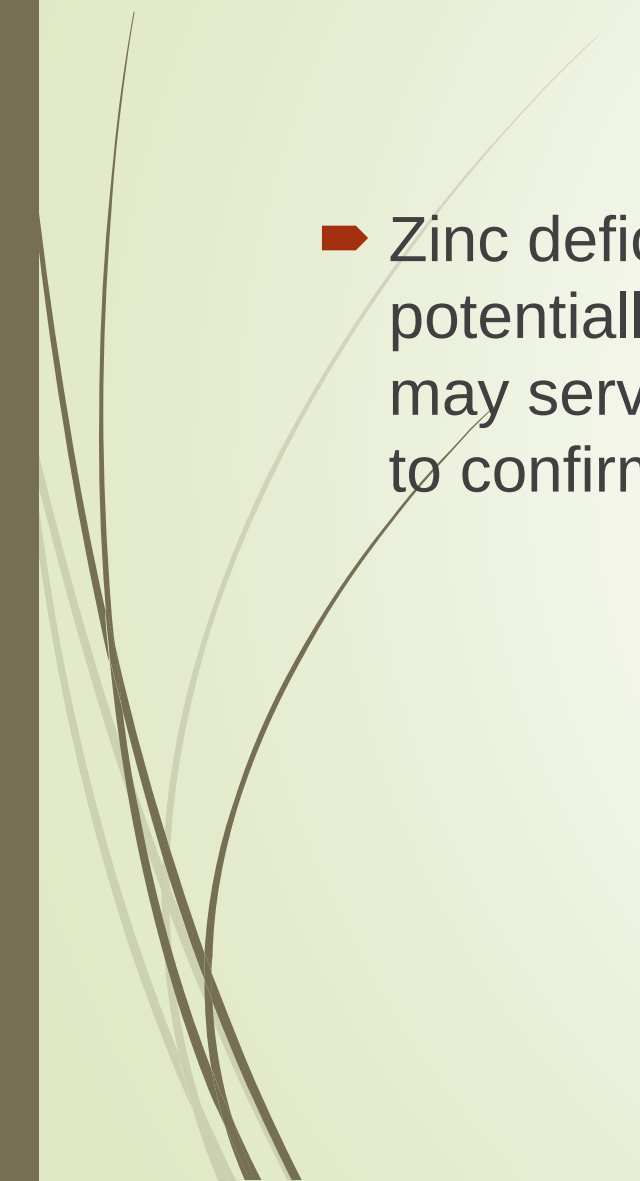


Conclusion

- These findings suggest that patients with ENL have a significant zinc deficiency compared to both non-reactional leprosy patients and healthy individuals (with $p=0.005$, Kruskal-Wallis test).
- Zinc deficiency may contribute to immune dysregulation observed in ENL, highlighting the potential role of zinc supplementation as a benefit for the therapeutic intervention.
- Further studies are required to validate these findings and explore the clinical benefits of zinc in managing leprosy reactions.



Take away message

- Zinc deficiency is significantly associated with ENL in leprosy patients, potentially contributing to immune dysregulation. Zinc supplementation may serve as a therapeutic intervention, but further studies are needed to confirm its clinical benefits.
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Acknowledgement

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3. The Leprosy Mission Great Britain, UK

I am working as a Clinical & Research Laboratory Manager at Mycobacterial Research Laboratories (MRL), Anandaban Hospital, The Leprosy Mission Nepal for the past 3 years. I received my Masters in Clinical Biochemistry from IOM in 2018. At MRL, my research interest is in the study of role of micronutrients in leprosy and its clinical outcomes

