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Evaluation of IgM Anti-PGL-1 Levels in Leprosy Diagnosis: Correlation with Bacteriological Index and PCR

RES-370

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Background

Leprosy, caused by Mycobacterium leprae, is a chronic neglected disease often associated with delayed diagnosis and severe disabilities. Accurate classification into paucibacillary (PB) and multibacillary (MB) forms is essential for effective treatment and transmission control.

Objective

This study evaluates the diagnostic utility of the IgM anti-PGL-1 serological test in differentiating leprosy types.

Method

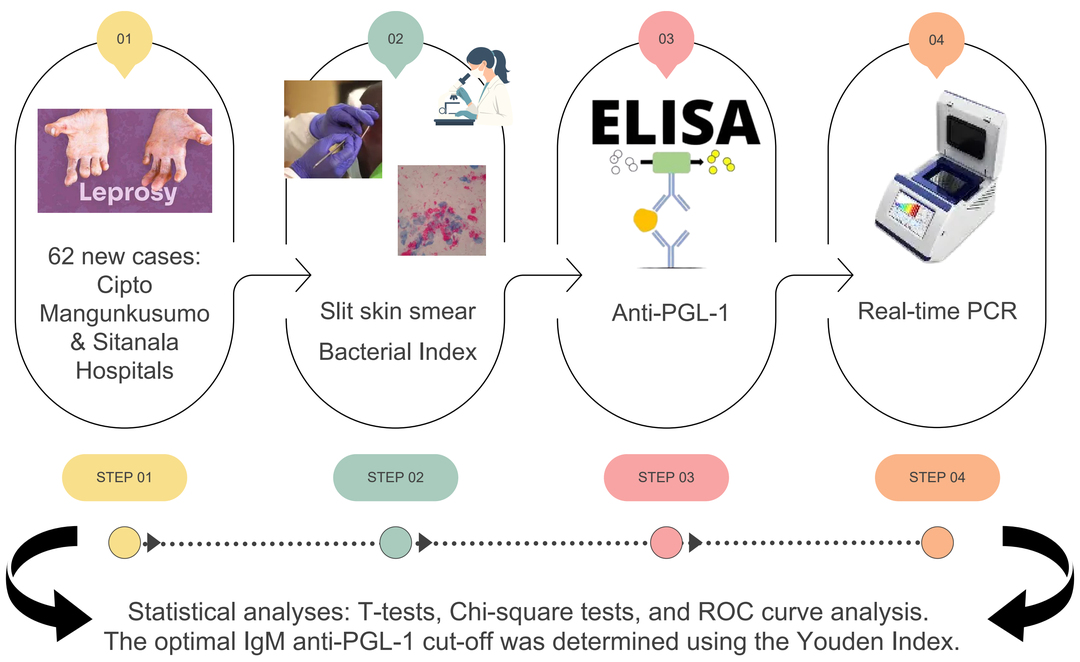

Fig1. Schematic Graph of Methodology

Results

The optimal IgM anti-PGL-1 cut-off was 170.76 pg/ml (*Youden Index: 0.806*), with 100% sensitivity and 80.6% specificity.

Table1. IgM anti-PGL-1 cut-off

IgM anti-PGL-1				
Positive if Greater Than or Equal To	Sensitivity	Specificity	1 - Specificity	***Youden Index (YI)***
.....	.....	.....	.....	....
152	1	0.774	0.226	0.774
170.76	***1***	***0.806***	***0.194***	***0.806***
185.225	0.968	0.806	0.194	0.774
.....	.....	.....	.....	....

All MB patients (n=32, 100%) had IgM levels above the cut-off, compared to 6 of 30 PB patients (20%).

Table2. IgM anti-PGL-1 Level among Leprosy Patients

IgM anti-PGL-1 level (pg/ml)	Leprosy type (N)		Total (N)
	Multibacillary	Paucibacillary	
High (≥170,76)	32	6	38
Low (<170,76)	0	24	24
Total	32	30	62

Bacterial index (BI) ranged from +1 to +5 in MB and was 0 in all PB cases. PCR positivity was 100% (32/32) in MB and 53.3% (16/30) in PB cases.

Table3. PCR Examination Results among Leprosy Patients

PCR Result	Leprosy type (N)	
	Multibacillary	Paucibacillary
Positive	32	16
Negative	0	14
Total	32	30

There was strong agreement between IgM levels and BI classification (Kappa = 0.838, p<0.001).

Table4. Agreement between IgM levels and BI classification

	Value	*Asymptotic Standard Errora*	*Approximate T*	*Approximate Significance*
Measure of Agreement Kappa	**0.838**	0.07	11.97	0.001
N of Valid Cases	62			

ROC analysis showed high discriminatory power for BI (AUC = 0.984) and IgM anti-PGL-1 (AUC = 0.9098).

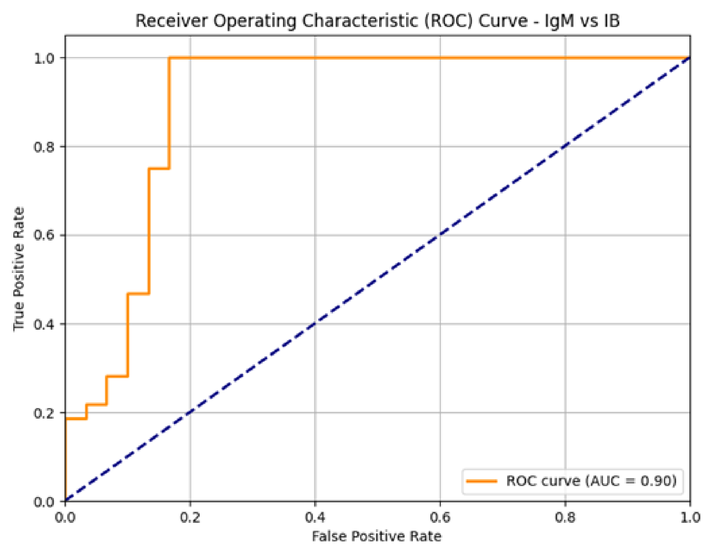

Fig2. ROC Analysis for BI and IGM anti-PGL-1

Conclusions

Although IgM anti-PGL-1 serology has limitations in diagnosing all forms of leprosy, it serves as a valuable supplementary tool for distinguishing between paucibacillary and multibacillary, aiding in accurate classification and management.

References:
1. World Health Organization. 2022. Global leprosy (Hansen disease) update, 2021: moving towards interruption of transmission. *Wkly. Epidemiologi. Rec.* **36**: 429–450.
2. Buhrer-Sekula, S. 2008. PGL-1 Leprosy Serology. *Revista da Sociedade Brasileira de Medicina Tropical* **41(Suplemento II)**:3-5.

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