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Optimizing Leptospirosis Diagnosis in Sri Lanka: Selection of Regional Serovar Panel for Cost-Effective MAT Implementation

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Background: Leptospirosis remains underdiagnosed in Sri Lanka despite its endemicity. The Microscopic Agglutination Test (MAT) is the recommended diagnostic method; however, its use is restricted to a few laboratories due to the high cost of maintaining live serovars, procedural complexity, and the lack of region-specific panels. Although previous studies have reported reactive serovars in Sri Lanka, updated evidence from clinically suspected patients in the North Central Province (NCP) remains extremely limited.

Objectives: To identify the most prominent reactive *Leptospira* serovars in clinically suspected leptospirosis patients in NCP, to support the development of region-specific, limited-serovar MAT panels.

Methods: A total of 329 serum samples, received between May 19, 2022, and July 18, 2025, from four government hospitals in the NCP, were tested at the Public Health Research Laboratory, Rajarata University, using an 11-serovar MAT panel. MAT positivity was defined as a titre $\geq 1:400$ in acute or paired samples, or a four-fold rise in titre.

Results: Seventy-one samples (21.6%) were positive, with the highest diagnostic MAT titres at $\geq 1:3200$ (n=28, 39.4%), 1:1600 (n=22, 31%), 1:800 (n=12, 16.9%), and 1:400 (n=9, 12.7%). Fifty-eight (81.7%) showed seropositivity in acute-phase samples, while 13 (18.3%) were confirmed through paired sera. All 11 serovars exhibited varying degrees of seropositivity. Eighteen patients (25.4%) reacted to a single serovar, whereas 53 (74.6%) showed cross-reactivity with two or more serovars. Serovar Icterohaemorrhagiae was the most frequently reacted serovar (n=54, 76.1%), followed by Canicola (n=49, 69%), Bratislava (n=45, 63.4%), and Patoc (n=42, 59.2%). Serovar Bratislava was the predominant serovar to yield the highest titre ($\geq 1:3200$) in 18 (25.4%) patients. Overall, 64/71 (90.1%) samples showed seropositivity with at least one of these four predominant serovars, highlighting their diagnostic relevance.

Conclusions: This study demonstrated four predominant *Leptospira* serovars accounted for 90.1% of seropositivity with samples from NCP. These findings support the use of region-specific MAT panels with fewer serovars as a feasible approach to improving diagnostic coverage.

Keywords: Leptospirosis, MAT panel, Seropositivity.