

Comparison of diagnosis of Leptospirosis by microscopic agglutination test and polymerase chain reaction

P. D. Gangani¹, Y. de Silva¹, N. Fernando¹, S. Rajapakse², S. Premawansa³,
S. M. Handunnetti¹

¹*Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, Sri Lanka*

²*Postgraduate Institute of Medicine, University of Colombo, Sri Lanka*

³*Department of Zoology and Environment Sciences, Faculty of Science,
University of Colombo, Sri Lanka*

Leptospirosis is a zoonotic disease caused by spirochaetes of genus *Leptospira*. Sri Lanka is considered as a hotspot for leptospirosis. Leptospirosis includes wide spectrum of clinical features ranging from mild fever to multi-organ dysfunction which mimics many other infectious diseases. The objective of this study was to detect *Leptospira* DNA using *flaB* nested PCR in a set of patient samples (n=105) which had been previously tested for leptospirosis using Microscopic Agglutination Test (MAT). Patient blood samples collected during May 2012 and October 2014, having days of onset of symptoms <10 and clinically characterised as severe or mild were used. MAT positivity was considered as having a titer of ≥ 400 in acute serum, a four-fold rise in MAT titer between acute and convalescent sera and seroconversion ≥ 100 in paired sera. DNA was extracted from whole blood samples and *flaB* nested PCR was carried out as described previously. Of the 105 samples, 75 (71%) showed MAT positivity and 41 samples (39%) were positive in *flaB* nested PCR. No significant differences were observed in days of onset of symptoms in both MAT positive and negative patients as well as PCR positive and negative patients. Within the MAT positive group, 45% were negative by *flaB* nested PCR. Among the MAT positive patients, the proportion of PCR positive, severe leptospirosis patients (68%) was significantly higher than those who were PCR positive and having mild leptospirosis ($p < 0.005$). Considering MAT as a reference standard, *flaB* nested PCR showed 54.66% sensitivity and 100% specificity. Together, these findings are consistent with previous studies indicating that a combination of positivity through MAT and PCR is more suitable as a diagnostic option for confirming leptospirosis which is defined as a biphasic infection.

Keywords: *Leptospira, Sri Lanka, Microscopic Agglutination Test, flaB nested PCR, Days of symptoms*

Acknowledgements: This work was supported by the ICGEB CRP/LKA17-01 and NRC-17-098 grants awarded to SH.