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High serum nitrite levels as a prognostic marker for severe leptospirosis

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At present, there are no standard prognostic markers related to factors contributing to pathogenesis of severe leptospirosis. The objective of this study was to assess the potential of serum nitrite level as a prognostic marker of disease progression to severity. Laboratory confirmed severe (SL) and mild leptospirosis (ML) patients (SL, n = 60 and ML, n = 60) and non-leptospirosis fever (NLF) patients (n = 60) were selected. Serum nitrite (NO_2^-) levels were tested in patients using the Griess assay and compared with healthy controls (n = 40). Intra-assay and intra-assay coefficients of variability (%CV), ANOVA, Independent samples t-test, and Mann-Whitney U test were performed and ROC curves were plotted. Both intra-assay %CV (7.363) and Inter-assay %CV (8.619) were within the acceptable range. SL patients had significantly high serum NO_2^- levels (1.99 ± 1.57 µM) compared to ML (1.14 ± 0.62 µM), NLF (0.86 ± 0.88 µM) and HC (0.84 ± 0.80 µM) ($P < 0.001$). Serum NO_2^- levels of ML patients were comparable to those of the NLF patients. Comparison of acute and convalescent sera of SL and ML patient (n = 13/group) showed that although the NO_2^- levels of acute sera were significantly different, they were comparable at the convalescent stage (1.93 ± 1.41 µM and 1.11 ± 0.61 respectively). Among SL patients, the serum NO_2^- levels decreased significantly from acute to convalescent stage ($P = 0.003$) where as in the ML patients NO_2^- levels in both stages were comparable. Serum NO_2^- levels were not dependent on the number of days of illness. Area under the curve of ROC (SL vs ML) was 63.5 % with the P value of 0.01. Using a serum nitrite cutoff value of 1.99 µM, the test had a specificity of 90% and a sensitivity of 45% in detecting a case of severe leptospirosis. Serum NO_2^- levels may be used a prognostic marker with high specificity, albeit relatively low sensitivity, for developing severe leptospirosis.

Acknowledgements: Financial assistance by National Research Council (NRC-12-077)

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