

Leptospiral 3-hydroxyacyl-CoA dehydrogenase as an early urinary biomarker of leptospirosis in a Sri Lankan setting – Interim results

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Introduction and Objectives: The 3-hydroxyacyl-CoA dehydrogenase (3-HADH) enzyme is of leptospiral origin and is excreted with urine of the patient. The objective of this study was to determine whether the 3-HADH enzyme is present in the urine of acute leptospirosis confirmed patients, using an enzyme-linked immunosorbent assay (ELISA) to assess its likelihood as a screening test for leptospirosis.

Methods: Laboratory confirmation of leptospirosis was done by *flaB*-nested PCR on plasma samples of acute leptospirosis suspected patients received from the Teaching Hospital Peradeniya. Urine samples of PCR positive patients and the same number of randomly selected PCR negative patients were subjected to 3-HADH based ELISA. An ELISA plate coated with supernatants of urine and rabbit anti-3-HADH was used as the primary antibody. The absorbance (OD) measurements obtained at 492 nm were analyzed using SPSS software version 20.0 with descriptive statistics and independent samples t-test.

Results: Forty-one leptospirosis suspected patients were analyzed in this study, of which 31 (75.6%) were males. The mean fever day for the cohort was 5.12 days, and 17 patients had less than or equal to 4 days of febrile illness. Twelve patients were confirmed positive for leptospirosis by *flaB*-nested PCR. The OD values for the PCR positive patients ranged from 1.2241 to 0.1530, whereas those of the selected PCR negative patients were 0.2932 to 0.086. Urine of PCR positive patients in the early phase of the disease (less than 5 days of fever) contained 3-HADH enzyme significantly higher levels of enzyme than PCR negative patients in the same phase of illness (t equal variances) = 2.262, 95% CI (0.014117 – 0.756312) P = 0.043).

Conclusions: The 3-HADH enzyme excreted in urine can be detected by ELISA during the early phase (less than 5 days of fever) of human leptospirosis.

Keywords: Leptospirosis, 3-hydroxyacyl-CoA dehydrogenase, ELISA, urine biomarker

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