

## Serum anti-oxidant capacity and NO<sub>x</sub> levels in leptospirosis patients

Wickramasinghe S A<sup>1</sup>, Handunnetti S M<sup>1</sup>, Kalugalage T L<sup>1</sup>, Eugene EJ<sup>1</sup>, Gunaratna R I<sup>1</sup>, De Silva H J<sup>2</sup>, Rajapakse S<sup>3</sup>

<sup>1</sup>*Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo*

<sup>2</sup>*Department of Medicine, Faculty of Medicine, University of Kelaniya.*

<sup>3</sup>*Department of Clinical Medicine, Faculty of Medicine, University of Colombo*

### Introduction

Release of reactive oxygen and reactive nitrogen species (ROS and RNS) contribute to increased oxidative stress and also tissues damage which is thought to lead to multi-organ failure in Leptospirosis. The antioxidant capacity (AOC) of serum provides a measure of overall protection against oxidative damage. RNS (ie., nitric oxide (NO<sup>•</sup>) released is immediately converted to NO<sub>2</sub> and NO<sub>3</sub> (NO<sub>x</sub>) and serum NO<sub>x</sub> levels reflect the level of NO<sup>•</sup> released.

### Objectives

To assess the serum antioxidant capacity and NO<sub>x</sub> levels in severe leptospirosis patients.

### Methods

Patients fulfilling clinical and epidemiological criteria for a diagnosis of leptospirosis were recruited in 2009 (n=75), 2010 (n=83) and 2011 (n=81). Confirmation of leptospirosis was based on microscopic agglutination test titre ( $\geq 400$ ) and/or presence of leptospira specific IgM antibodies. RNS and ROS levels were determined by measuring serum NO<sub>2</sub> and NO<sub>x</sub> and AOC levels respectively. Age, sex matched healthy controls and non-leptospirosis fever (NLF) controls were included.

### Results

In all three sample collections, serum NO<sub>2</sub> levels of confirmed, acute leptospirosis patients were significantly higher compared to healthy controls (P<0.05). In both 2010 and 2011 sample collections, serum NO<sub>x</sub> levels (31.1-18.5  $\mu$ M; n=50) of severe patients were significantly higher compared to mild leptospirosis patients, NLF and healthy control groups (19.3-14.3 $\mu$ M; n=46, 12.7-12.3  $\mu$ M; n=68 and 5.8-5.5 $\mu$ M, n=43; P<0.05 respectively. Both severe and mild leptospirosis patients had comparable levels of AOC levels (1.05 $\pm$ 0.04 and 1.03 $\pm$ 0.09  $\mu$ M/mg protein respectively) which were significantly higher compared to NLF and healthy control groups (0.97 $\pm$ 0.04 and 0.92 $\pm$ 0.03  $\mu$ M/mg protein; P<0.05 respectively).

### Conclusion

Serum NO<sub>x</sub> levels could be used as prognostic indicators in severity of leptospirosis infections. AOC levels as a biomarker of oxidative stress needs to be further investigated.

*This work was supported by IBMBB, University of Colombo. This work was published as a 1) Poster at the Proceedings of the 6th Annual Sessions of the Institute of Biochemistry, Molecular Biology and Biotechnology, University of Colombo, April, 2012, and 2) 2. Poster at the 6th Biennial Sessions of the Allergy and Immunology Society of Sri Lanka, 15<sup>th</sup> June, 2012.*