

## Increased oxidative stress in severe leptospirosis

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Release of reactive oxygen and reactive nitrogen species (ROS and RNS) contribute to increased oxidative stress and to tissue damage which is thought leading to multi-organ failure in leptospirosis. Serum nitrite level is a direct reflection of RNS produced in an acute infection while serum antioxidant capacity (AOC) is an indirect measure of ROS production which indicates the potential for overall protection against oxidative damage. The objective of this study is to assess the level of oxidative stress caused by RNS and ROS in severe leptospirosis patients. Patients fulfilling clinical and epidemiological criteria for a diagnosis of leptospirosis were recruited (n=120). Confirmation of leptospirosis was based on microscopic agglutination test titre. Laboratory confirmed severe (SL) and mild leptospirosis (ML) patients (SL, n=60 and ML, n=60) were selected. RNS levels were determined by measuring serum NO<sub>2</sub><sup>-</sup> and ROS levels were indirectly determined using AOC levels. Serum NO<sub>2</sub><sup>-</sup> and AOC levels of confirmed leptospirosis patients were compared with age, sex matched healthy controls (n=30) and non-leptospirosis fever (NLF) controls (n=60). Serum NO<sub>2</sub><sup>-</sup> levels of severe leptospirosis patients were significantly higher compared to ML patients, NLF controls and healthy controls (p<0.05). Serum AOC levels of severe patients were significantly lower compared to ML patients, NLF controls and healthy controls (p<0.01). Only SL patients showed a significant negative correlation between serum nitrite and AOC levels (R=0.255, p<0.05) among all patient groups whereas healthy controls had a significant positive correlation (R=0.417, p=0.02). Significantly high serum RNS, low serum AOC levels and negative correlation between RNS and AOC predict significantly increased oxidative stress in severe leptospirosis.

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