Alpha-Lipoic Acid Attenuates Polymicrobial Sepsis-Induced Neuroinflammation and Oxidative Stress in Rats

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INTRODUCTION: Sepsis is an infection causing disturbance in the normal regulation of many organic systems, including the central nervous system. Pathophysiological mechanisms of sepsis-induced brain dysfunction involve oxidative stress and neuroinflammation. **AIM:** We aimed to study the alpha-lipoic acid (ALA) effect as an important antioxidant and anti-inflammatory compound on brain dysfunction in rats using a relevant animal model of polymicrobial sepsis. **MATERIAL AND METHODS:** Sepsis was induced in Wistar rats by cecal ligation and perforation (CLP) or sham (control) and treated with oral administration of ALA (200 mg/kg after CLP) or vehicle. The experimental groups were divided into Sham+saline, Sham+ALA, CLP+Saline and CLP+ALA. Twelve and twenty-four hours after CLP, the hippocampus, prefrontal cortex and cortex were obtained and assayed for levels of TNF-α and IL-1β, nitrite/nitrate concentration, myeloperoxidase (MPO) activity, thiobarbituric acid reactive species (TBARS) formation, protein carbonyls, superoxide dismutase (SOD) and catalase (CAT) activity. **RESULTS AND DISCUSSION**: ALA reduced cytokine levels, nitrite/nitrate concentration and MPO activity in the brain regions between 12 and 24 hours after CLP. To oxidative damage, ALA reversed lipid peroxidation in 24 hours in all structures and protein carbonylation in 12 and 24 hours only in the hippocampus and cortex after sepsis. This reflected of the increase of CAT activity in the hippocampus and cortex in all times. **CONCLUSION:** Our data provides the first demonstration that ALA reduces the consequences of polymicrobial sepsis in rats, by decreasing inflammatory and oxidative stress parameters in the brain.

Palavra chave: Alpha-lipoic acid; Brain; Sepsis.

Patrocínio: CNPq, CAPES.