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MELATONIN REDUCES LIPOPOLYSACCHARIDE-INDUCED KIDNEY DAMAGE IN RATS

Danka Sokolović[1], Milan Lazarević[2,3], Dragan Milić[2,3], Zoran Stanojković[1], Milan N. Petković[2], Nikola M. Stojanović[2], Dušan T. Sokolović[2]

1Blood Transfusion Institute Niš, Niš, Serbia
2University of Niš, Faculty of Medicine, Niš, Serbia
3University Clinical Centre Niš, Clinic for Cardiovascular and Transplant Surgery, Niš, Serbia

Contact: Dušan T. Sokolović,
Zorana Đinđića 81, 18000 Niš, Serbia;
Phone number: +381642136478;
e-mail: dusantsokolovic@gmail.com

Lipopolysaccharide (LPS) is a constituent of Gram-negative bacterial cell walls, thus LPS injection has been widely used as a model of experimental acute kidney injury associated with sepsis. LPS-induced sepsis is caused by excessive secretion of pro-inflammatory mediators and reactive oxygen species (ROS). The neurohormone melatonin, which is mainly secreted by the pineal gland, regulates the circadian rhythm, has an anti-inflammatory and immunoregulatory role. Melatonin and its metabolites have been shown to scavenge various free radicals and reactive oxygen intermediates. The aim of this study was to evaluate the effect of melatonin in preventing endotoxemia-induced kidney damage caused by LPS, by analysing the concentration of urea and creatinine in the blood serum of rats. Twenty-eight Wistar albino rats were randomly divided into four groups (n = 7 per group) as follows: 1) Control group, 2) MLT group (50 mg/kg, per os), 3) LPS group (10 mg/kg, i.p.) and 4) LPS + MLT group (10 mg/kg + 50 mg/kg). Serum levels of creatinine and urea were significantly higher ($p<0.05$) in the LPS-treated animals compared with values in the control group. Co-application of LPS and MLT significantly reduced an increase in serum creatinine and urea levels ($p<0.05$). It can be concluded that oral administration of melatonin significantly alleviates LPS-induced acute nephrotoxicity in rats. It is likely that the beneficial effects of melatonin are related to its known antioxidant effects on kidney tissue, and possibly to some other less known/studied effects. *Acta Medica Medianae 2023;62(1):15-20.*

Key words: *melatonin, lipopolysaccharide, kidney, urea, creatinine*