# Platonin, a photosensitizing dye, improves circulatory failure and mortality in rat models of endotoxemia

周敦穗

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## 摘要

## Abstract

Platonin, a cyanine photosensitizing dye, is a potent macrophage-activating agent and an immunomodula-tor. In this study, we compare the inhibitory effects of platonin with those of the three clinical drugs minocycline, clindamycin, and cyclosporin, on hypotension, tachycardia, and nitric oxide (NO) formation in a rat model of circulatory shock induced by Escherichia coli lipopolysaccharide (LPS). We also evaluate the effect of drugs on the 6 h survival rate in LPS-treated rats. Administration of LPS (15 mg/kg) caused a rapid drop in mean arterial blood pressure (MAP). Minocycline (10 mg/kg, i.v.) significantly prevented the fall of MAP at 3 h, and platonin (100 μg/kg, i.v.) markedly prevented the fall of MAP within the 0-3 h period after LPS administration. However, neither clindamycin (10mg/kg, i.v.) nor cyclosporin (15 mg/kg, i.v.) had any effects in this study. On the other hand, an inducible NO synthase inhibitor, NG-nitro-L-arginine ester (L-NAME), caused a significantly increase in MAP and a moderate bradycardia after LPS administration. In addition, an increase in plasma nitrate formation elicited by endotoxemia was significantly reduced by pretreatment with either minocycline (10 mg/kg) or platonin (100 μg/kg). However, only platonin (100 μg/kg) markedly reduced the mortality and prolonged the mean survival time in LPS-treated rats. Minocycline, clindamycin, and cyclosporin had no effects under the same conditions. Further studies using an electron spin resonance (ESR) method were conducted on the scavenging activity of platonin on the free radicals formed. Platonin (10 μM) greatly reduced the ESR signal intensity of superoxide anion, hydroxyl radical, and methyl radical formation. In conclusion, platonin has beneficial effects on ameliorating endotoxaemia. This protective effect of platonin may be mediated, at least partly, by the reduced drop in MAP and the inhibition of NO and free radical formation in rat models of endotoxemia