



Preconditioning with the low dose of lipopolysaccharide attenuates apoptosis in the heart during septic shock in mice

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Abstract:

Despite advances in medical treatment, septic shock is associated with very high mortality. Myocardial injury is a common condition in septic shock. The pretreatment with a low dose of lipopolysaccharide (LPS) was proven to diminish injury in the animal heart. The purpose of the study was to investigate whether pretreatment with a low dose of bacterial LPS (preconditioning) may also inhibit apoptosis occurring in the mouse heart during septic shock. Three groups of male C57BL/6J mice were injected intraperitoneally with various doses of LPS (*E.coli* 055:B5): 0.5 mg/kg, 10 mg/kg, and 0.5 mg/kg 24 h prior to 10 mg/kg (the preconditioned group). Control group received solvent. Mice were sacrificed 24 h after the last injection. Apoptosis was evaluated on formalin-fixed slides using TUNEL-fluorescein method. Phosphorylation of STAT3 and expression of Bcl-2 was assessed by Western blotting. High dose of LPS (10 mg/kg) increased the incidence of apoptosis in the heart, whereas pretreatment with the preconditioning dose (0.5 mg/kg) of LPS significantly attenuated this effect. Western blot analysis revealed that a single treatment with low dose of LPS resulted in increased phosphorylation of Stat3. The expression of the Bcl-2 in the preconditioned animals was significantly higher than in animals treated with the high LPS dose alone.

Preconditioning with the low dose of LPS attenuates the activation of apoptosis in the course of septic shock. This effect may rely on activation of Stat3, hence, preservation of higher levels of antiapoptotic proteins, like Bcl-2.

Key words:

lipopolysaccharide, preconditioning, septic shock, heart, apoptosis, mice
