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INVESTIGATION ON THE MECHANISMS INVOLVED IN THE VASOPROTECTIVE EFFECTS OF PROPOLIS ON CHRONIC UNPREDICTABLE MILD STRESS-INDUCED VASCULAR DYSFUNCTION IN RATS

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Objectives: Chronic stress and depression have crucial role in the development of cardiovascular diseases. We have previously shown that propolis ameliorated chronic unpredictable mild stress (CUMS)-induced vascular dysfunction. In this study, we aimed to investigate the possible mechanisms of beneficial vascular effect of propolis in the UCMS-exposed rats.

Materials-Methods: Male Wistar albino rats were used. The rats in stress and stress+propolis groups were subjected to different types of stressors daily for 35 days. The extract of propolis (100 mg/kg/day) was administered orally to control+propolis and stress+propolis groups during stress protocol. At the end of the CUMS period, blood and thoracic aorta samples were collected. Serum corticosterone levels were measured to evaluate the model of stress. Vascular reactivity was measured in thoracic aorta preparations. To explore the mechanisms of vasorelaxation, cumulative propolis responses were recorded after incubation of L-NAME and indomethacin. In addition, the expressions of TNFα, IL-1β, eNOS and SOD in the thoracic aorta were assessed.

Results: Serum corticosterone levels significantly increased after stress protocol ($p<0.05$). In stress group, endothelium-dependent relaxations, and also eNOS and SOD expressions were significantly decreased, while the expressions of TNFα and IL-1β were significantly upregulated compared to controls ($p<0.05$). Propolis improved vascular function and alterations of protein expressions. Propolis-induced vasorelaxations significantly decreased after in vitro incubation of L-NAME and indomethacin ($p<0.05$).

Conclusions: Chronic treatment with propolis may prevent CUMS-induced changes in endothelial function by antiinflamatuar and antioxidant effects. Improvement of endothelial NOS and cyclooxygenase activity in vasculature after propolis treatment may contribute this beneficial effect.

Keywords: Propolis, vascular function, chronic stress, inflammatory cytokines, oxidative stress