Effects of the ginkgo biloba extract on the superoxide dismutase activity and apoptosis of endothelial progenitor cells from diabetic peripheral blood

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ABSTRACT. Although ginkgo biloba extract (GBE) was shown to have antioxidant effects, little has been reported on the ability of GBE to help endothelial progenitor cells (EPCs) resist oxidative stress. The present study evaluated the influence of different concentrations of GBE on superoxide dismutase (SOD) and apoptosis of diabetic peripheral blood EPCs. Twenty-five diabetic patients without any vascular complications were included in the experimental group, while 15 healthy adults made up the control group. Peripheral blood mononuclear cells were isolated with density gradient centrifugation, and, after in vitro differentiation, were determined to be EPCs using FITC-UEA-I and Dil-Ac-LDL dual staining. After the colony and fusiform adherent cells were observed, on day 7, various concentrations of ginkgo biloba extract (0, 10, 25, 50 mg/L) were added to the culture medium for a 24-h incubation. EPC-SOD activity and apoptosis were subsequently detected. We found that within the experimental group, GBE significantly improved SOD
activity within EPCs and reduced the rate of apoptosis. These effects became more obvious with increasing GBE concentrations (25 mg/L, \( P < 0.05 \); 50 mg/L, \( P < 0.01 \)). GBE also improved SOD activity and reduced the rate of apoptosis within EPCs of the control group; however, the changes were not statistically significant. We conclude that GBE can improve SOD activity and reduce the rate of apoptosis of EPCs within the peripheral blood of diabetic patients, effects that are dose-dependent.

**Key words:** Ginkgo biloba extract; Endothelial progenitor cells; Superoxide dismutase; Apoptosis