

The Effects of Ellagic Acid on Rat Heart Induced Tobacco Smoke

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Abstract : One of the common causes of cardiovascular disease (CVD) is smoking. Moreover, tobacco smoke decreases the amount of oxygen that the blood can carry and increases the tendency for blood clots. Ellagic acid is a powerful antioxidant found especially in red fruits. It was shown to block atherosclerotic process suppressing oxidative stress and inflammation. The aim of this study was to examine the protective effects of ellagic acid against oxidative damage on heart tissues of rats induced by tobacco smoke. Twenty-four male adult (8 weeks old) Sprague-Dawley rats were divided randomly into 4 equal groups: group I (Control), group II (Tobacco smoke), group III (Tobacco smoke + corn oil) and group IV (Tobacco smoke + ellagic acid). The rats in group II, III and IV, were exposed to tobacco smoke 1 hour twice a day for 12 weeks. In addition to tobacco smoke exposure, 12 mg/kg ellagic acid (dissolved in corn oil), was applied to the rats in group IV by oral gavage. An equal amount of corn oil used in solving ellagic acid was applied to the rats by oral gavage in group III. At the end of the experimental period, rats were decapitated. Heart tissues and blood samples were taken. Histological and biochemical analyzes were performed. Vascular congestion, hyperemic areas, inflammatory cell infiltration and increased connective tissue in the perivascular area were observed in tobacco smoke and tobacco smoke + corn oil groups. Increased connective tissue in the perivascular area, hemorrhage and inflammatory cell infiltration were decreased in tobacco smoke + EA group. Group-II GSH level was not changed (significantly), CAT, SOD, GPx activities were significantly higher than group-I. Compared to group-II, group-IV GSH, SOD, CAT, GPx activities were increased, and MDA level was decreased significantly. Group-II and Group-III levels were similar. The results indicate that ellagic acid could protect the heart tissue from the tobacco smoke harmful effects.

Keywords : ellagic acid, heart, rat, tobacco smoke

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