

Turkish Journal of Medical Sciences



Turkish Journal
of
Medical Sciences

Effects of Cigarette Smoking on Blood Antioxidant Status in Short-Term and Long-Term Smokers

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Abstract: To determine the effects of cigarette smoking on blood antioxidant status and lipid peroxidation, 16 healthy male current smokers (CS) and 16 healthy male non-smokers (NS) serving as controls were studied. CS were divided into two groups: short-term smokers (STS) 35.4 ± 5.8 years of age (mean \pm SD), and long-term smokers (LTS) 60.9 ± 4.9 years of age. The average smoking period of STS and LTS were 8.1 ± 1.1 years (mean \pm SD) and 20.5 ± 4.5 years (mean \pm SD) respectively. STS and LTS had their own controls, who were NS (young NS and old NS respectively). When STS and LTS values are compared with their control values, the following are determined: 1-SOD and catalase activities increased significantly ($p < 0.05$) in LTS, but were unchanged in STS. 2-STs and its control contained the same quantity of total glutathione and reduced glutathione (GSH). However, the oxidized glutathione (GSSG) level in STS was significantly elevated ($p < 0.01$). 3- In LTS, reduced glutathione diminished ($p < 0.01$), while GSSG increased significantly ($p < 0.01$), but total GSH was unchanged. 4- Smoking did not affect a-tocopherol level in STS, but an apparent decrease was observed in LTS ($p < 0.05$). 5-Thiobarbituric acid reactive substance (TBARs) level as an index of lipid peroxidation increased significantly ($p < 0.05$) in LTS, in spite of being unchanged in STS. 6-In comparing short-term and long-term smokers to each other, significant decreases were observed in total glutathione, reduced glutathione and a-tocopherol levels ($p < 0.05$) in LTS. There were no significant differences between STS and LTS in the other measured parameters. It was concluded that the changes in the enzymatic and nonenzymatic antioxidant defense systems of elderly smokers may be due to oxidative stress caused by cigarette smoking.

Key Words: Oxidative stress, antioxidants, TBARs

Turk J Med Sci 2001; **31**(6): 553-558.

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