
**Abstract**

Stress is implicated in the pathogenesis of numerous disorders such as cardiovascular diseases or neurodegeneration. The extensive overlap between diseases attributed to stress and oxidative damage is indicative of their potential relationship. We hereby study the influence of alpha-tocopherol (alpha-toc) on the development of stress biomarkers (morphological and biochemical), on specific biomarkers of radical insult (lipid peroxidation, oxidized proteins, or glutathione content in brain and liver), as well as on drug metabolism. In our experimental protocol two groups of female rats are exposed to stress conditions, i.e. cold plus starvation. Before stress and during its application one group is treated with alpha-toc for 20 d (0.42 mmol/kg per os, once daily). Our results indicate that oxidative damage accompanies the development of stress, while treatment with alpha-toc completely prevents stress-induced radical attack and reduces stress indices like plasma corticosterone, uropepsinogen, and morphological changes. It is found that stress increases the drug metabolic potential of the liver (total P450, CYP2E1, or CYP3A1 activity). Administration of alpha-toc, in combination with stress, further increases erythromycin N-demethylation (CYP3A1) compared to stress control, while 4-nitrophenol hydroxylation (CYP2E1) is not affected significantly.