

NITROXIDE AS AN ANTIOXIDANT IN THE PROTECTION OF HEART TISSUE IN DOXORUBICIN TREATED RATS

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The action of reactive oxygen species (ROS) leads to the oxidation of lipids and proteins. Peroxidation products such as 4-hydroxynonenal and other unsaturated aldehydes, and malonyldialdehyde react with thiobarbituric acid and form colour complexes (TBARS). In numerous studies it has been shown that oxygen free radicals play an important role in the toxicity of doxorubicin (DOX). Nitroxides are a group of stable radicals that have antioxidant properties in reactions with oxygen free radicals. In this study, nitroxides were tested for the protection of heart tissue against doxorubicin-induced lipid peroxidation.

Wistar rats were divided into 4 groups: the control; animals injected with DOX; animals injected with nitroxides (Pirolin, 3-carbamoyl-2,2,5,5-tetramethylpiroline-1-oxide and Pirolid, 3-carbamoyl-2,2,5,5-tetramethylpiroline-1-oxide); and animals injected simultaneously with DOX and a nitroxide. After 4 days, the rats were anaesthetised and their hearts were removed and frozen at -70°C. Lipid peroxidation was determined as the content of TBARS in heart homogenates.

Lipid peroxidation induced by doxorubicin was attenuated by Pirolin. Pirolid was more toxic for heart tissue than Pirolin, and together with DOX it displayed a pro-oxidant effect.