

ABSTRACT

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Cardiovascular diseases are the world's most common cause of mortality and morbidity, in particular coronary heart disease and its most severe form – acute myocardial infarction (AMI). Better prediction of AMI can be achieved by a detailed understanding of the mechanisms of its etiopathogenesis.

In this study, we focused on the assessment of oxidative stress in 2-h model of isoprenaline cardiotoxicity, i.e. the acute state, which shares several pathophysiological similarities with early phase of AMI, in Wistar:Han rats. The marker of oxidative stress was glutathione. Moreover, the analysis of correlations of oxidized glutathione (GSSG), total glutathione (GSHt) and the ratio GSH/GSSG with ECG parameters was performed.

The rats were divided into two groups, i.e. the control group (water for injections, 2 ml/kg, s.c.) and the isoprenaline group (isoprenaline, 100 mg/kg, s.c.).

In rats, which were treated with isoprenaline and did not survive the 2-h experiment, a significant increase in the concentration of GSSG and decrease in ratio GSH/GSSG were observed.

Significant correlations were described between GSSG concentration and heart rate, amplitude P, amplitude S, QTpeak interval and RR interval, respectively. Moreover, the relationships were found between the ratio GSH/GSSG and heart rate, amplitudes P, Q, R and S, RR interval and QTpeak interval, respectively.

In conclusion, it is evident that the concentration of GSSG and particularly the ratio GSH/GSSG could be the potential markers of oxidative stress in the 2-h model of isoprenaline cardiotoxicity. The study showed that the level of oxidative stress can be at least partially evaluated by using ECG parameters, as well.

KEYWORDS:

catecholamines, isoprenalin, acute myocardial infarction, oxidative stress, glutathione, ECG