

Abstract

During cold acclimation the heat production is shifted from shivering to non-shivering thermogenesis, which is mediated by adrenergic signaling. It has also been observed, that cold acclimation may increase the organismal resistance to pathological stimuli and may affect functional parameters of cardiovascular system. However, acute exposure to severe cold is often associated with detrimental effects on the body. We have recently shown that chronic exposure to cold increases the heart's resistance to ischemia-reperfusion injury without negative side effects when mild temperatures are used, however the mechanism of protection is not yet known. The aim of this work was to determine whether: i) if the sensitivity of the heart to ischemia changes already after the first day of cold exposure and does not show any negative effects, ii) if β_1 -adrenergic signaling plays a role in chronic regimen of cold-induced cardioprotection. The results of this work showed that i) one day of exposure to mild cold did not change the sensitivity of the heart to ischemia and ii) metoprolol treatment reduced the infarct size in the control group, but did not affect the heart of cold-adapted rats.

Key words : Heart, rat, beta 1 adrenergic receptors, cold acclimation