

The Effects of Preconditioning with Normobaric Hyperoxia on Tissue Damage, Mechanical Performance and Arrhythmias Induced by Ischemia-Reperfusion in Isolated Heart of Morphine Dependent Rat

Mazloom, R.¹, Hajjzadeh, S.², Semnianian, S.³, Pourkhalili, K.⁴, Bayat, G. R.⁵, Alavian, F.⁶, Safari, F.⁷

Abstract

Introduction: Hyperoxia is an easy access preconditioner which attracts the researcher to use it in the clinic. Drug dependence is a widespread prevalence among different societies and one of the confounding factors in many diseases. Among different drugs, morphine dependence has shown preconditioning effects. According to both widespread phenomenon of drug addiction and use of hyperoxia in the clinic, there is a high probability of interaction between these two preconditioner factors on the ischemia-reperfusion injuries. Therefore, in this study, interaction of these two preconditioners on the ischemia-reperfusion injuries has been investigated. **Method:** Each containing ten rats, hearts were isolated in langendorff setup and after local ischemia, release of creatine phosphokinase (as a tissue damage index) and rate pressure product (as a mechanical function index) were measured. Furthermore, episode numbers of ventricular tachycardia and ventricular fibrillation (as arrhythmias indices) during ischemia and reperfusion period were studied separately. **Results:** normobaric hyperoxia in isolated morphine dependent rat hearts decreased creatine phosphokinase and increased mechanical function during reperfusion period. However, there was no significant difference in arrhythmias toward each of these preconditioners alone. **Conclusion:** preconditioning with normobaric hyperoxia in isolated morphine dependent rat heart induced reduction of tissue damage and improved cardiac function.

Keywords: preconditioning, ischemia-reperfusion, normobaric hyperoxia, morphine dependence

۸

۸

سال ششم، شماره ۲۱، بهار ۱۳۹۱
Vol. 6, No. 21, Spring 2012

1. Author-in-chief: Ph.D. Student of Medical Physiology of Tarbiat Modares University. E-mail: rohammazloom@hotmail.com
2. Professor of Tarbiat Modares University & Institute for Cognitive Science Studies
3. Professor of Tarbiat Modares University
4. Assistant Professor of Boushehr University of Medical Sciences
5. Ph.D. of Medical Physiology of Tarbiat Modares University
6. Ph.D. Student of Medical Physiology of Tarbiat Modares University
7. Assistant Professor of Shahid Sadoughi University of Medical Sciences