CAN SHORT-TERM PRECONIDITIONING WITH LEMON BALM EXTRACT PROTECT THE HEART FROM I/R INJURY?

Draginic N[1,2], [1]Milosavljevic I [1]Andjic M, [3]Rankovic M, [1]Jeremic J, [3]Sretenovic J, [3,4]Zivkovic V, [2]Bolevich S, [2,3]Jakovljevic V

[1]*Department of Pharmacy, Faculty of Medical Sciences, University of Kragujevac, Serbia*
[2]*Department of Human Pathology, First Moscow State Medical, University IM Sechenov, Moscow, Russia*
[3]*Department of Physiology, Faculty of Medical Sciences, University of Kragujevac, Serbia*
[4]*Department of Pharmacology of the Institute of Biodesign and Complex System Modelling, First Moscow State Medical, University I.M. Sechenov*

The role of phytochemicals as a safe and efficient cardioprotective strategy is gaining scientific attention. Thus, this study aimed to explore whether 8-day application of ethanolic *M. officinalis* extract can salvage the heart from deleterious effects of myocardial ischemia-reperfusion injury (I/R).
The research involved 32 male *Wistar* rats randomly divided into following groups (n=8): I/R- nontreated rats with I/R injury, ME50, ME100 and ME200- rats with I/R injury treated with either 50, 100 or 200 mg/kg of ME for 8 days *per os.* After accomplishing the protocol, the animals were sacrificed, the hearts were isolated and mounted on *Langendorff* apparatus to continuously monitor cardiodynamic parameters. After 20-min stabilization, we induced 20-min ischemia, followed by 30-min reperfusion. Oxidative stress parameters were determined from both coronary venous effluent (O_2^-, H_2O_2, NO_2^-, TBARS) and the samples of heart tissue homogenate (TBARS, SOD, CAT and GSH).
Lemon balm extract induced improvement of cardiac contractility via increase in dp/dt max and dp/dt min, improved SLVP and CF, with no effect on heart rate compared to I/R group. Additionally, significant reduction of prooxidants, O_2^-, H_2O_2 and index of lipid peroxidation (TBARS) was noticed, while NO_2^- was significantly increased in treated groups compared to I/R group. No significant changes on antioxidant enzymes were observed. In general, most prominent effects were noticed in ME200 group.
This study`s results suggest that even 8-day administration of lemon balm may improve cardiac function and mitigate oxidative stress in I/R conditions. Thus, this plant extract may be considered a useful cardio-preventive strategy.

Keywords: Melissa officinalis; lemon balm; Oxidative stress; isolated rat heart; I/R injury