Protective Effects of Vitamin C & E and Hydrocortisone against Intestinal Ischemia-Reperfusion Injury in Rats

Omid Azari¹, Reza Kheirandish¹, Parham Razavi Ebrahimi², Mohammad Farajli Abbasi³, Masoud Bidi², Mohammad-Reza Esmaili-Nejad²

¹ Department of Clinical Sciences, Faculty of Veterinary Medicine, Shahid Bahonar University, Kerman-Iran
² Veterinary students, Faculty of Veterinary Medicine, Shahid Bahonar University, Kerman-Iran
³ Post Graduated Student of Veterinary Surgery, Faculty of Veterinary Medicine, Shahid Bahonar University, Kerman-Iran

Email: Parhamrazavi@gmail.com

Objective- This study was performed to investigate the protective effects of different medications (vitamin C, vitamin E and Hydrocortisone) against experimental intestinal ischemia-reperfusion injury.

Design- Original Study

Animals- 25 male Wistar albino rats

Procedures- In this study rats randomly divided into five equal groups. Group Normal: Intact group, Group Control: Ischemia-reperfusion group (45 min of ischemia followed by 1 h of reperfusion), Group Vitamin C: Ischemia-reperfusion plus vitamin C treatment (50 mg/kg, IV, immediately after reperfusion), Group Vitamin E: Ischemia-reperfusion plus vitamin E treatment (10 mg/kg, IM, 15 minutes before reperfusion), and Group Hydrocortisone: Ischemia-reperfusion plus hydrocortisone treatment (50 mg/kg, IV, immediately after reperfusion). Ischemia was induced by clamping of abdominal aorta above the cranial mesenteric artery. After the experiments, the jejunum was removed and the tissues were processed for histopathologic examination. Intestinal histology was semi-quantitatively assessed.

Results- Control group animals showed severe mucosal damage. Intestinal mucosa in the Vitamin C and E groups were noticeably preserved in comparison with Control group (p<0.05). Comparison of histologic scores between the treatment groups showed that the Vitamin C and E groups have significant improvement compared to the Hydrocortisone group (p<0.05), but there is no significant difference between the Vitamin C & E groups (p>0.05). The Hydrocortisone group doesn’t show any improvement in histopathologic scores in the comparison with control group (p>0.05). There are significant differences between normal and all treatment groups (p>0.05).

Conclusion and Clinical Relevance- Based on the results, it can be concluded that administration of Vitamin C and E before reperfusion of blood flow to the ischemic tissue diminish deleterious effects of IR injuries in intestine.

Key words- Intestine, Ischemia-reperfusion, Vitamin C, Vitamin E, Hydrocortisone

References