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Clinical Insights on Pre- and Novel Postconditioning in Equine Jejunal Ischemia

Ilker Sengul^{1,2}, Demet Sengul³

¹Division of Endocrine Surgery, Giresun University Faculty of Medicine, Giresun, Turkey

²Department of General Surgery, Giresun University Faculty of Medicine, Giresun, Turkey

³Department of Pathology, Giresun University, Faculty of Medicine, Giresun, Turkey

Corresponding author: Demet Sengul, MD. Professor (Assoc) of Pathology. Founder Chair, Department of Pathology. The Founder Chair, Scientific and Research Laboratories, Giresun University Faculty of Medicine. Gazipasa Compound, Gazi Avenue. 28100 Giresun, Turkey. E-mail: demet.sengul.52@gmail.com. ORCID ID: <http://www.orcid.org/0000-0002-0416-0621>.

Conditionings still remain as one of the challenging, attractive, and mysterious issues in reperfusion injury, to date. Murry and colleagues (1) introduced the concept of ischemic preconditioning (IPC), i.e. the repetitive brief episodes of ischemia in order of rendering the myocardium more resistant to a subsequent prolonged ischemic insult that causes irreversible injury in 1986. In 2003, the Vinten-Johansen Laboratory of Cardiothoracic Surgery reported a canine coronary artery occlusion-reperfusion experimental model, that termed as ischemic postconditioning (IPoC), in which a similar regimen of brief episodes of ischemia carried out just after, instead of just before, revealing the reduced infarct size, coronary artery endothelial dysfunction, and neutrophil accumulation in the area at risk (2). We read with respect the research article, entitled: 'The effect of ischaemic postconditioning on mucosal integrity and function in equine jejunal ischemia' (3). This research purposed to investigate the feasibility of ischemic postconditioning (IPoC) in equine intestinal ischemia and to evaluate its effect on histomorphology, electrophysiology and paracellular permeability. For this purposes, the authors induced the experimental jejunal ischemia for 90 min in horses under general anesthesia and the jejunum was reperfused without further intervention in the control group, while inducing the ischemia for 90 min with the implementation of reocclusion, following its release by clamping the mesenteric vessels in three cycles of 30 seconds, which followed by 120 minutes of reperfusion in IPoC group. Finally, Verhaar et al. (3) reported in their study, for which they declared as the first intestinal IPoC study in horses, the intestinal mucosa was being revealed less villus denudation and paracellular permeability following IPoC, indicating the IPoC protection on the equine intestinal ischemia-reperfusion (I/R) injury. The authors previously reported their valuable research, entitled 'Preconditioning with lidocaine and xylazine in experimental equine jejunal ischaemia' (4). Herewith, they declared that preconditioning with lidocaine did not have any effect on the tested variables while xylazine exhibited a beneficial effect on ischemia-reperfusion (I/R) injury as apoptosis rate and inflammation. Nevertheless, the clinical significance of these findings remains uncertain due not to reveal a concurrent reduction of histomorphologic injury. However, their surgical procedure and sample collection were defined as the experimental surgical resections of i) 10 cm intestinal segment, 1 m proximal to the jejunoileal junction (pre-ischemia [P] sample); ii) 10 cm intestinal segment, 2 m proximal to the jejunoileal junction (ischemia [I] sample) where an ischemia-induced by an umbilical tape for 90 min; and iii) an intestinal segment (reperfusion [R] sample) from the preoccluded area which left for reperfusion for 30 min in the same horse for each (4). We currently stated that I sample was acquired after exposing to the one (the excision of 10 cm intestinal segment, 1 m proximal to the jejunoileal junction) and R sample was got after exposing to the two (the excision of 10 cm intestinal segment, 1 m proximal to the jejunoileal junction and 10 cm intestinal segment, 2 m proximal to the jejunoileal junction in the same horse for each) surgical procedures, published in Vol 74, *Medical Archives* (5). Of note, in living organisms, hormonal and metabolic responses to surgical and other physiological stresses, *per se*, are identified as a kind of complex phenomena (6). Herein, we specified that the mentioned ineffective and unfruitful properties of xylazine and lidocaine would reverse as protective and beneficial as the surgical sampling procedure was performed after the same horse did not undergo one or two surgical interventions, so close to the sampling sites,

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as regarding and rating the whole body of this animal, horse (4,5). Vinten-Johansen group is one of the crucial leading groups in conditionings and we reported with him that the intestinal IPoC exhibited a protective effect on the mucosa with the demonstration of the best protection in the six-cycle algorithm by using four different experimental procedures in four different groups (7). Verhaar and colleagues (3) very recently reported IPoC protection on the equine intestinal I/R injury in their work with two different surgical procedures in two different groups. Consequently, the first equine intestinal IPoC study revealed its targeted histopathologic protection of reperfusion injury (3). Anecdotally, we postulate that the so-called postconditioning concept, *per se*, is enriched and revealed the positive outcomes by the application of the relevant individual surgical procedures in entirely different groups of the novel equine postconditioning (3,7,8), comparing the previous equine preconditioning model by Verhaar and colleagues (4), in terms of experimental intestinal conditionings in order to cope with reperfusion injuries. This issue merits further investigation. We thank Verhaar et al. (3,4) for their valued works.

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