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Induction of selective liver hypothermia prevents significant ischemia/reperfusion injuries in rats after 24 hours

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Abstract

Background and Aims: induction of liver hypothermia is a surgical tool able to prevent warm ischemic injuries. Protective mechanisms involved are not completely understood, but the protection to liver microcirculation and reduction of inflammation are potential candidates to explain the attenuation of the reperfusion injuries. The study aims to investigate the effects of induction of selective liver hypothermia, the role of endothelial and inducible oxide sinthases (eNOS and iNOS), inflammatory citokines and histopathological injuries in a rodent model.

Methods: 19 male Wistar rats were subjected to 90 minutes partial 70% liver ischemia either in normothermia (Group N) or selective 26ºC hypothermia (Group H). 24-hours after reperfusion, livers were sampled and sent to analyses. Anatomopathological

sections were scored for sinusoidal congestion, ballooning, hepatocelllular necrosis and neutrophilic infiltrates.

Results: At the end of the experiment, liver tissue expressions of TNF-α, IL-1ß, iNOS and TNF-α/IL-10 ratio were significantly reduced in the H group compared to N group ($P<0.05$), whereas IL-10 and eNOS were significantly increased ($P<0.05$). IL-6 expression was similar between the groups. Histopathological injury scores revealed significant decrease in H group ($P<0.05$)

Conclusions: Selective liver hypothermia prevents I/R injury by limiting the release of inflammatory citokines, preservation of microcirculation, and attenuation of the inflammatory response. The supression of the inflammatory cascade by selective liver hypothermia enabled maintainance of the liver architecture.