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SMALL BOWEL ISCHEMIA – A COMPARATIVE EXPERIMENTAL STUDY

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Introduction: Serious small bowel injuries can occur during superior mesenteric artery (SMA) occlusion. Nevertheless significant damage of the small intestine can be observed following lower limb vascular occlusions as well as a systemic consequence of local ischemic-reperfusion (IR) injury of the muscles and might be due to the redistribution in systemic circulation. There are limited data available on the determination of the degree of injury after lower limb vascular operations.

Aim: To evaluate the effects of lower limb ischemia and SMA ischemia on small intestinal injury, and to compare the obtained result.

Materials and Methods: Male Wistar-rats ($n=30$) underwent in one group ($n=10$) 3 hours of bilateral lower limb ischemia achieved by infrarenal aortic occlusion. In another group of rats ($n=10$) 1 hour of mesenteric ischemia was induced. The length of reperfusion was standardized in 6 hours in both groups. Sham operated groups were created for each IR group ($n=2 \times 5$). For analysis of redox-homeostasis (*free-radical-content, antioxidant-levels*) and for histological assessment (Chiu-score), samples were taken from specified sections (jejunum and ileum) of the small intestine.

Result: Free-radical-content has increased significantly after SMA (jejunum: $p=0.025$ ileum: $p=0.029$), as well as after infrarenal occlusion (jejunum: $p=0.014$ ileum: $p=0.010$) in the small intestine, compared to the Sham-operated groups. The levels of tissue antioxidants were significantly ($p<0.05$) reduced in both IR-injured groups in comparison with the Sham-groups. Except for the jejunum SH-group values there were no significant alterations between the two IR-injured groups regarding the redox-state parameters ($p>0.05$). Considering the histological evaluation of intestinal injury no significant differences were detected between the two occlusion groups with the Chiu semiquantitative score ($p>0.05$).

Conclusion: In this study we demonstrated that sublethal mesenteric IR-injury and 3 hours of bilateral lower limb ischemia can induce similar extent of small bowel damage.

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