



Renal Injuries after Cardiac Arrest: A Morphological Ultrastructural Study

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Background: This study aims to investigate the probable lesions and injuries induced in the renal tissue after a cardiac arrest. The renal ischemia-reperfusion model in cardiac arrest describes the effects of ischemia in the kidneys, alongside a whole-body ischemia-reperfusion injury. This protocol excludes ischemic conditions caused by surgical vascular manipulation, venous injury or venous congestion.

Methods: For the experimental study, 24 swine were subjected to cardiac arrest. Seven minutes later, the cardiopulmonary resuscitation technique was performed for 5 min. Afterwards, advanced life support was provided. The resuscitated swine consisted one group and the non-resuscitated the other. Tissue samples were obtained from both groups for light and electron microscopy evaluation.

Results: Tissue lesions were observed in the tubules, parallel to destruction of the microvilli, reduction in the basal membrane invaginations, enlarged mitochondria, cellular vacuolization, cellular apoptosis and disorganization. In addition, fusion of the podocytes, destruction of the Bowman's capsule parietal epithelium and abnormal peripheral urinary space was observed. The damage appeared more extensive in the non-resuscitated swine group.

Conclusions: Acute kidney injury is not the leading cause of death after cardiac arrest. However, evidence suggests that the kidney damage after a cardiac arrest should be highly considered in the prognosis of the patients' health outcome.