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0078. Establishing a detailed short-term rat model of partial ischaemia/reperfusion injury

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Introduction

Liver ischaemia/reperfusion (I/R) injury may be observed after major hepatic surgery or resuscitation from severe trauma/haemorrhage. Well-characterised and representative animal models are needed to better understand mechanisms of injury, apply effective treatments and prevent complications.

Objectives

To establish a well-characterized rat model of partial liver I/R injury.

Methods

Under isoflurane anaesthesia, tracheotomized male Wistar rats underwent left common carotid artery and right jugu-

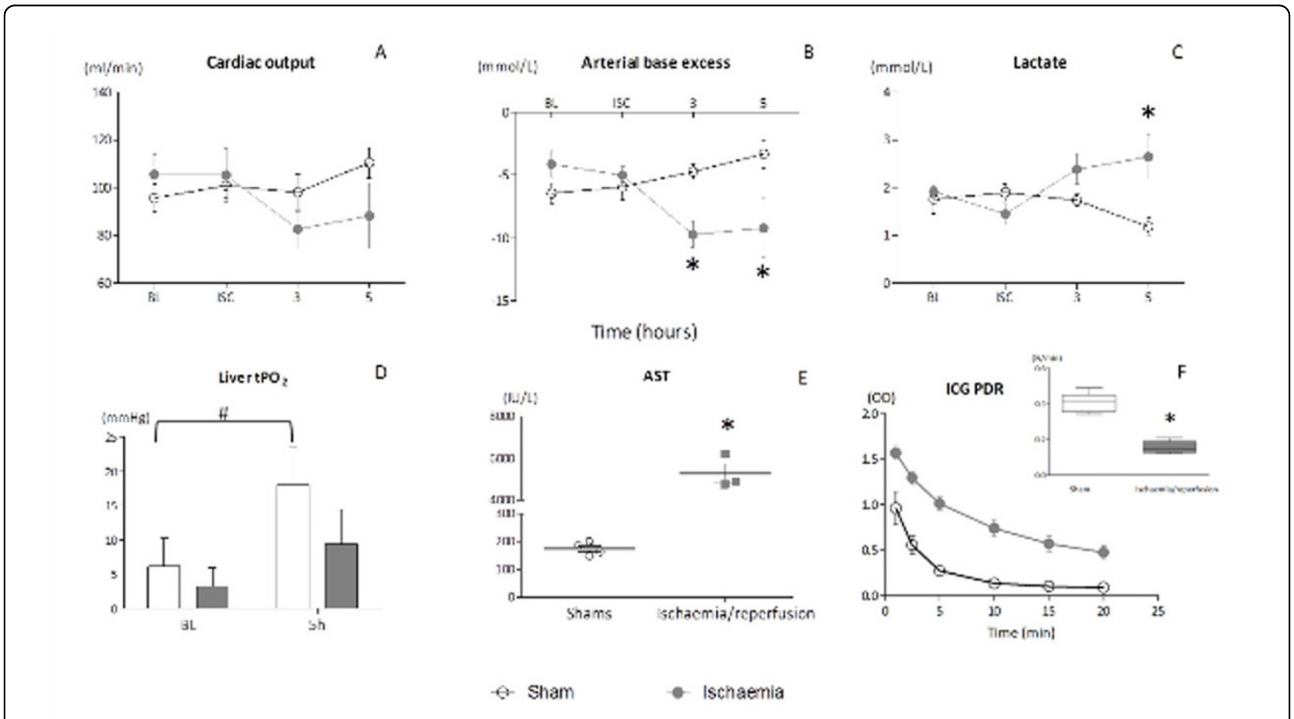

Figure 1 ISC= Ischaemia, BL= baseline, OD= optical density AST= aspartate aminotransferase. Data shown as mean (SEM) (A-E) or median (interquartile range) (F). Sham= 6, Ischaemia= 5/group, *p< 0.05 comparing ischaemia to sham, #p< 0.05 comparing BL to 5h. Statistics performed using t-test or two-way ANOVA and Bonferroni's test for multiple comparisons, as appropriate.

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lar vein instrumentation for BP measurement/blood sampling and fluid infusion (10 ml/kg/hr), respectively, and bladder catheterization for urine output measurement. Via a transverse subcostal laparotomy, blood vessels to the median and left liver lobes were occluded with a surgical clamp for 60 mins. On release of the clamp, the remaining liver lobes were ligated to prevent a steal phenomenon. The animals were observed for a further 5 hours. Sham animals underwent the same procedure except for vascular occlusion. Measurements were made of haemodynamics (BP, echocardiography), blood gas analysis, and biochemical and functional (Indocyanine Green plasma disappearance rate, ICG-PDR) liver function tests. A tissue PO_2 probe (tPO_2) (Oxford Optronix, UK) was placed in contact with liver tissue to measure hepatic tissue PO_2. Tissue samples were taken to assess microscopic and ultrastructural injury both locally and remotely (data not shown).

Results

See figure 1.

Liver ischaemia resulted in an increase of markers of hepatic injury (AST) and function (ICG-PDR and Lactate). Cardiac output was maintained but arterial base excess was different between groups. tPO_2 at 5 hours post-reperfusion recovered in shams but not in I/R group.

Conclusions

This severe liver I/R model demonstrates derangement of hepatic function, biochemistry, haemodynamic and ultrastructure. It offers utility for the assessment of interventions aimed at preventing or reducing I/R injury.

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