

ORAL PRESENTATION

Open Access

0473. Necrosis and apoptosis in liver, spleen, pancreas, kidney and intestinal tissue induced by intra-abdominal hypertension in a porcine model. Second part of an experimental study

JA Buensuseso Alfaro^{1*}, M Poblano Morales¹, MA Moreno Eutimio², J Mendoza Escorza¹, S Zamora Gómez¹, G Magdaleno Lara¹, FJ Tendillo Cortijo³, M Lomelí Terán⁴, JJ Martínez Mazariegos⁵, E Deloya Tomas⁶, L Torres López¹, T Mondragon Labelle¹

From ESICM LIVES 2014

Barcelona, Spain. 27 September - 1 October 2014

Introduction

Intra-abdominal hypertension (IAH) and abdominal compartment syndrome (ACS) are increasingly recognized as severe complications of critical illness.

Objectives

Characterize the apoptosis and necrosis in the renal, intestinal, splenic, pancreatic and hepatic tissue in an experimental porcine model after six hours of IAH.

Methods

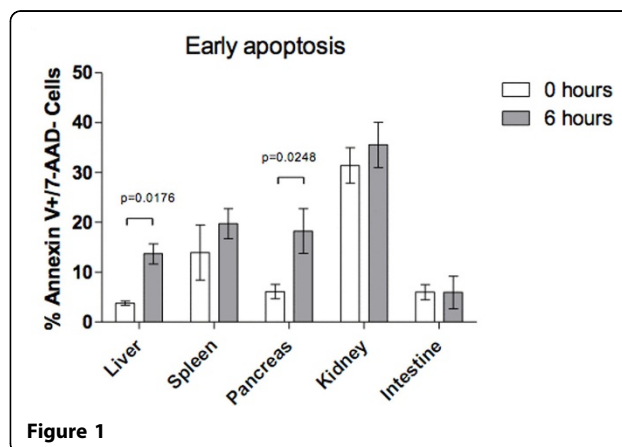
Four York-Landrace mixed breed piglets with a mean body weight of 30 kg were obtained from Center for Teaching, Research and Extension in Swine Production, Faculty of Veterinary Medicine, National Autonomous Mexican University.

Biopsies were taken from liver and kidney by laparoscopy prior to induction of IAP, the intra-abdominal pressure was increased with an intra-peritoneal catheter that was placed in the peritoneal cavity at the level of the umbilicus; and then a saline 0.9% solution was infused to increase intra-abdominal pressure. The IAP was increased up to 20 mmHg, renal and liver biopsies were performed by exploratory laparotomy after the increase of IAP to 20 mmHg and 6 hours after sustained elevated IAP.

The biopsy was cut in two pieces and these were immediately placed into a disposable disaggregator

Medicon with 50 μ m separator mesh plus 1 mL of ice-cold PBS and processed for 50 s in the Medimachine System.

The cell suspension were stained with FitC-conjugated mAb specific for CDXX, PE-conjugated mAb specific for CDXX. Briefly, 1×10^6 were stained with the fluorochrome-conjugated mAb specific for cell surface antigen markers for 20 min in the dark at 4°C. After incubation, the cells were resuspended in 200 μ L PBS for subsequent flow cytometric analysis using a Accuri C6 flow cytometer and then were analysed using FlowJo software V10.



¹Hospital Juarez of Mexico, Intensive Care Unit, Mexico, Mexico
Full list of author information is available at the end of the article

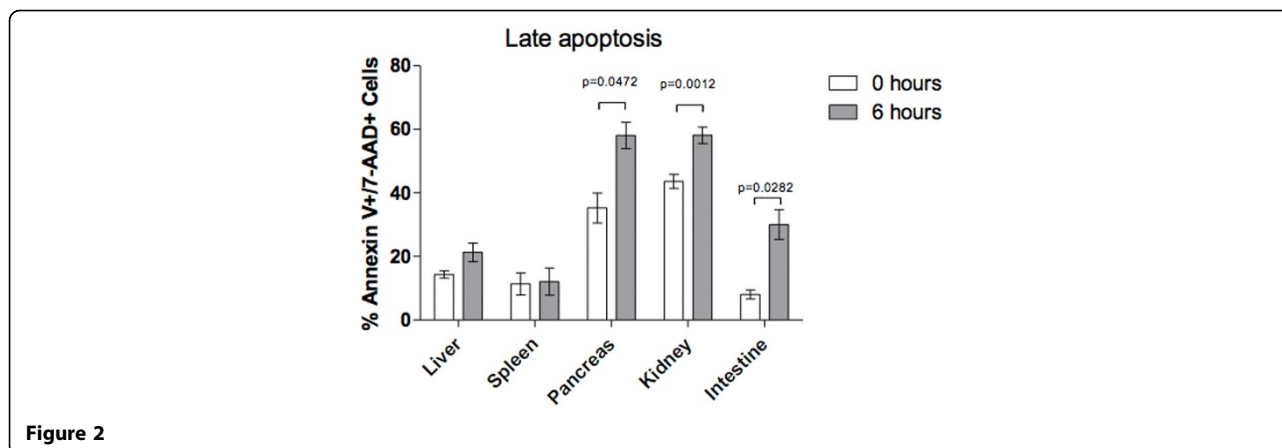


Figure 2

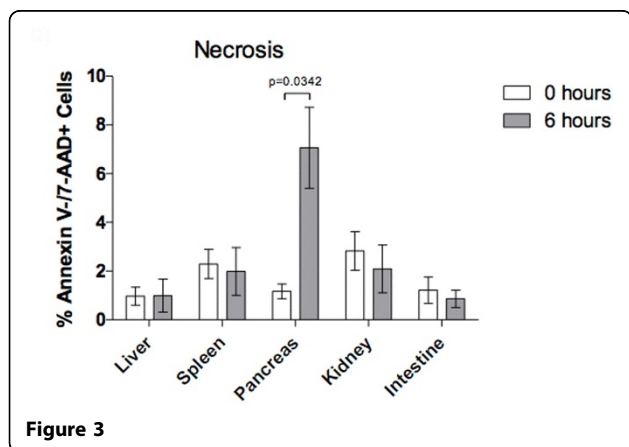


Figure 3

Results

After 6 hours of sustained IAH there was no difference in the percentage of cells in early apoptosis in the spleen ($p=0.19$) and intestinal tissue ($p=0.24$). There was difference in the liver ($p=0.01$) and pancreas ($p=0.02$).

There was difference in pancreas ($p=0.04$), kidney ($p=0.01$) and intestinal tissue ($p=0.02$) after 6 hours of sustained IAH in the percentage of cells in late stage apoptosis, and only the pancreatic tissue shown necrosis ($p=0.03$) (Fig. 1, Fig. 2, Fig. 3)

Conclusions

Apoptosis and necrosis presents in pancreas above all, but also in hepatic, splenic, intestinal and kidney tissues after six hours of IAH. Our data suggests that the greatest harm of sustained IAH take place in the pancreas, kidney and intestinal tissue in an early fashion and more lately in the liver.

Authors' details

¹Hospital Juarez of Mexico, Intensive Care Unit, Mexico, Mexico. ²Hospital Juarez of Mexico, Learning and Investigation Center, Mexico, Mexico. ³Sanity Investigation Institute Puerta de Hierro, Medical-Surgery Investigation Unit,

Madrid, Spain. ⁴Hospital Tec 100, Intensive Care Unit, Santiago de Queretaro, Mexico. ⁵Specialty Hospital Better Life ISSTEC, Intensive Care Unit, Tuxtla Gutierrez, Mexico. ⁶General Hospital San Juan del Rio, Intensive Care Unit, Santiago de Queretaro, Mexico.

Published: 26 September 2014

References

1. Al Mufarrej F, et al: Understanding intra-abdominal hypertension: from the bench to the bedside. *J.Intensive Care Med* 2012, **27**:145-160.
2. Gallagher JJ: Intra-abdominal hypertension: detecting and managing a lethal complication of critical illness. *AACN Adv.Crit Care* 2010, **21**:205-219.
3. Malbrain ML, et al: Intra-abdominal hypertension in the critically ill: it is time to pay attention. *Curr.Opin.Crit Care* 2005, **11**:156-171.

doi:10.1186/2197-425X-2-S1-O15

Cite this article as: Alfaro et al.: 0473. Necrosis and apoptosis in liver, spleen, pancreas, kidney and intestinal tissue induced by intra-abdominal hypertension in a porcine model. Second part of an experimental study. *Intensive Care Medicine Experimental* 2014 **2**(Suppl 1): O15.

Submit your manuscript to a SpringerOpen® journal and benefit from:

- Convenient online submission
- Rigorous peer review
- Immediate publication on acceptance
- Open access: articles freely available online
- High visibility within the field
- Retaining the copyright to your article

Submit your next manuscript at ► springeropen.com