

POSTER PRESENTATION

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Pre-existing systemic inflammation attenuates bacterial clearance by the liver in porcine abdominal sepsis

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Introduction

Bacterial translocation from the gut has been suggested to induce and maintain the systemic inflammatory response (SIRS) and organ dysfunction. The reticulo-endothelial system in the liver has a pivotal role in clearing the blood from circulating bacteria. To date, the effects of SIRS on hepatic bacterial clearance are not fully understood.

Objectives

To investigate if pre-existing inflammation, as seen in sepsis, influences the trans-hepatic bacterial clearance.

Methods

The study was conducted on anesthetized pigs in an intensive care setting. All animals were subjected to an infusion of *E coli* in the portal vein for 3 hours. In Group 1 (n=6), a systemic inflammatory response was induced by a continuous intravenous endotoxin infusion starting 24 h prior to the bacterial infusion. Group 2 (n=6) received the bacterial infusion without prior endotoxin exposure. Three animals (Group 3), serving as controls for effects of 24 h anesthesia, received saline instead of endotoxin for 24 h prior to the bacterial infusion. Bacterial counts in the portal and hepatic vein, as well as the levels of tumor necrosis factor- α (TNF- α) in venous blood were analyzed hourly during the bacterial infusion.

Results

All animals subjected to endotoxin developed SIRS. The amounts of bacteria administered were comparable

between the groups. The ratio of hepatic to portal vein bacterial counts was higher in Group 1 vs. 2 ($p < 0.001$; Figure 1). Peak plasma levels of TNF- α in Group 1 (1957 pg/mL (1843-2092) median (IQR)) were lower compared to Group 2 (69200 pg/mL (60305-77350); $p < 0.001$). Group 3 was numerically intermediate in bacterial counts and TNF- α levels and, according to the pre-defined plan, not included in the primary analysis.

Conclusions

Our results suggest that despite lower inflammatory response to bacterial infusion, the trans-hepatic bacterial clearance is a magnitude lower in pigs with pre-existing systemic inflammatory response. Should similar mechanisms operate in human critical illness, then hepatic clearance of bacteria from the gut is impaired by SIRS.

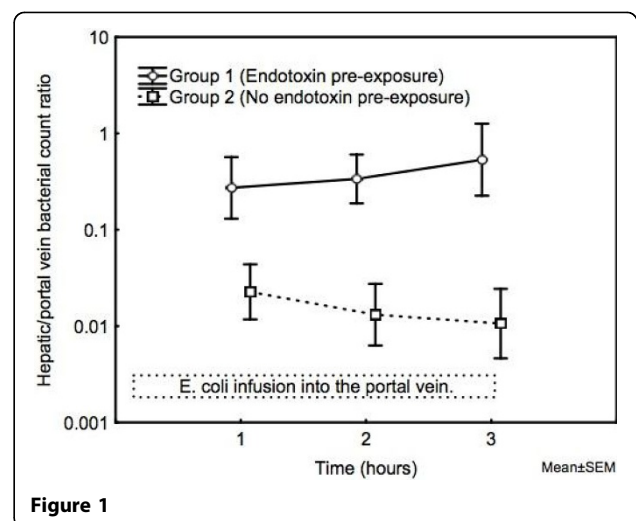


Figure 1

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