Upregulation of inducible nitric oxide synthase in acute cholecystitis

M.E. Bond[1,2], M. Michael[2], C.M. Woods[1], J. Toouli[1], B.O. Al-Jiffry[3], G.T.P. Saccone[1], [1]General & Digestive Surgery, Flinders University, Bedford Park, SA, Australia, [2]Gastroenterology & Hepatology, Flinders University, Bedford Park, SA, Australia, [3]Hepatobiliary & Liver Transplantation, King Abdulaziz Medical City, Riyadh, Saudi Arabia

Introduction: Acute cholecystitis is a serious and often painful disease, which involves inflammation of the gallbladder. A role for nitric oxide (NO) produced by inducible nitric oxide synthase (iNOS) has been demonstrated in the progression of other inflammatory diseases, however, the role of NO and iNOS in acute cholecystitis remains unclear. Aim: To determine if iNOS mRNA is upregulated during the progression of acute cholecystitis. Methods: This study used anaesthetised (IV infusion sodium thiopentone, 5mg/kg/h) Australian Brush-tail possums. Acute cholecystitis was induced via injection of *Escherichia coli* lipopolysaccharide (LPS) into the gallbladder lumen, with control animals receiving saline[1]. At 0, 4, 8, 12 or 24h post LPS/saline instillation the gallbladder was harvested and stored at –70°C (n=2-4 for each time point). Animals were then euthenased. mRNA was extracted from the gallbladder and iNOS expression quantified relative to normal gallbladder tissue, via real-time polymerase chain reaction using possum specific iNOS primers. Results: At 4h and 8h there was an increase in iNOS expression of about 10 fold in LPS treated animals. At 12h there was a marked increase in iNOS expression of up to 100,000 fold in LPS treated animals. At 24h iNOS expression in LPS treated animals returned to near base-line levels. Saline treated animals showed minimal increases in iNOS expression at all time points. Conclusion: iNOS expression is upregulated during acute cholecystitis, with peak levels at 12 hours post induction. This suggests that NO produced by iNOS may be involved in the inflammatory processes in acute cholecystitis.

This study was approved by the Animal Welfare Committee of Flinders University.

The support of the National Parks and Wildlife Service of South Australia is acknowledged.

(1) Al-Jiffry et al (2004) Neurogastroenterology and Motility, 16, 125-133.