

# HO-1 mediates the effects of HBO pretreatment against sepsis.

[Chang KY](#), [Tsai PS](#), [Huang TY](#), [Wang TY](#), [Yang S](#), [Huang CJ](#).

Department of Orthopedics, Mackay Memorial Hospital, Taipei, Taiwan.

**BACKGROUND:** We have recently shown that attenuation of sepsis-induced lung injury by hyperbaric oxygen (HBO) pretreatment involves expression regulation of inducible nitric oxide synthase (iNOS) and heme oxygenase (HO)-1. This study was performed to determine the effects of HBO pretreatment on acute kidney and liver injuries in septic rats and the roles of iNOS and HO-1. **MATERIALS AND METHODS:** One group of adult male rats (n = 48) were pretreated with HBO. The other group of rats (n = 48) breathed air at normal atmospheric pressure instead. Rats in each group were randomly allocated to receive injection of lipopolysaccharide (LPS), normal saline (N/S), LPS plus hemin (a HO-1 inducer), hemin, LPS plus SnPP (a HO-1 inhibitor), SnPP, LPS plus hemin plus SnPP, or hemin plus SnPP. Hemin and SnPP were injected at 1 h before HBO or air pretreatment. Rats were maintained for 6 h before sacrifice. **RESULTS:** LPS caused prominent kidney and liver injuries as well as iNOS and HO-1 expression in stimulated rats. HBO pretreatment significantly attenuated LPS-induced kidney but not liver injury. However, in conjunction with hemin (a HO-1 inducer), HBO pretreatment did attenuate LPS-induced liver injury. In addition, the inhibition of iNOS expression by HBO pretreatment was associated with "super-induction" (i.e., further enhancement) of LPS-induced HO-1 expression. Furthermore, the therapeutic effect of HBO could be counteracted by SnPP (a HO-1 inhibitor). **CONCLUSIONS:** HBO pretreatment significantly attenuates LPS-induced acute organ injuries in septic rats. The beneficial effect of HBO pretreatment against sepsis is mediated, at least in part, by "super-induction" of HO-1.