Why could prednisolone suppress the hepatic ischemia-reperfusion injury?

October 7 2008

Hepatic ischemia-reperfusion injury is a serious complication but unavoidable problem in liver surgery including liver transplantation and hepatic resection. The most important consequence of this pathological process is multiple organ failure with a high mortality rate. Steroid therapy suppresses liver injury by a variety of mechanisms, including increased tissue blood flow and suppression of oxygen free radicals, arachidonic acid derivatives, lysosomal proteases (cathepsins) and cytokine production. However, the exact intracellular mechanisms of steroid action on hepatic ischemia-reperfusion injury remains unknown.

A research article to be published on 21 July 2008, in the *World Journal of Gastroenterology* addresses this question. This research team was led by Prof. Meng Wang from Eastern Hepatobiliary Surgery Hospital of Shanghai.

The hepatic ischemia-reperfusion injury model was performed through clamped the left lateral and
median lobes of rat liver (68%) for 60 minutes and followed by 120 minutes reperfusion. Prednisolone was administered at 1.0, 3.0, or 10 mg/kg at 30 min before ischemia. In addition to biochemical and microscopic analyses, activation of calpain mu was determined using specific antibodies against the intermediate (activated) form of calpain. Degradation of talin was also studied by Western blotting.

They found that in the control and prednisolone (1.0 mg/kg) groups, serum aspartate transaminase (AST) and alanine transaminase (ALT)

level were elevated, and cell membrane bleb formation was observed after 120 min of reperfusion. Moreover, calpain mu activation and talin degradation were detected. Infusion of prednisolone at 3.0 or 10 mg/kg significantly suppressed serum AST and ALT, and prevented cell membrane bleb formation. At 10 mg/kg, prednisolone markedly suppressed calpain mu activation and talin degradation.

Their results indicate that prednisolone can suppress ischemia-reperfusion injury of the rat liver. Its cytoprotective effect is closely associated with the suppression of calpain mu activation and talin degradation.

Source: World Journal of Gastroenterology