Quercetin and tin protoporphyrin attenuate hepatic ischemia reperfusion injury: role of HO-1.

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Abstract

Ischemia reperfusion (IR) injury occurs in many clinical situations such as organ transplantation and hepatectomies resulting in oxidative stress and immune activation. Heme oxygenase-1(HO-1) is the rate-limiting step in the heme-degradation pathway and has a critical cytoprotective role. Induction of HO-1 improves liver I/R injury. Quercetin, a plant pigment (flavonoid), is an antioxidant and HO-1 inducer. Tin protoporphyrin (SnPP) is a HO-1 inhibitor. This study was designed to investigate the protective effect of quercetin in hepatic I/R injury and the role of HO-1. Wister rats were randomly divided into four groups (sham, I/R, quercetin, and SnPP). Liver ischemia was induced for 45 min then reperfusion was allowed for 1 h. Quercetin and surprisingly SnPP ameliorate the deleterious effect of I/R by reducing the oxidative stress and hepatocyte degeneration. Both agents decreased the elevated inflammatory cytokines and improved the inhibition of the antiapoptotic marker, Bcl2. They induced HO-1 content and expression. Quercetin has better cytoprotective effect than SnPP. These findings suggest that quercetin has a hepatoprotective effect against I/R injury via HO-1 induction and unexpectedly, SnPP showed the similar effect. Quercetin has more prominent protective effect than SnPP because of its superior ability to induce HO-1.

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