The effect of berberine nanomicells on hepatic cirrhosis in bile duct ligated rats

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Abstract

The present study was designed to investigate the possible hepatoprotective effect of berberine (BBR) nano micelles on liver cirrhosis induced by bile duct ligation model (BDL) in male rats.

Introduction: The anti-fibrotic effect of chronic berberine (BBR) had previously demonstrated in a rat model of bile duct ligation (BDL) - induced liver fibrosis. As a result, the aim of present study was to investigate the possible hepatoprotective effect of BBR nanomicelles on liver cirrhosis induced by Bile duct ligation model (BDL) in male rats.

Methods and Results: Male Wistar rats were divided into 7 groups (n= 6) including sham-operated, BDL + saline, BDL + nanoBBR (50 mg/kg, p.o.), BDL + nanomicelles, BDL + BBR (50 and 100 mg/kg, p.o.), BDL + silymarin (100 mg/kg, p.o.). After 21 days of drugs' treatments following bile duct ligateation, the serum and tissue levels of some hepatic markers were measured and pathologic evaluations performed.BDL could markedly increase aspartate aminotransferase (AST), alanine aminotransferase (ALT), and total bilirubin (TBIL) serum levels and tissue tumor necrosis factor-alpha (TNF-α), level along with reductions in tissue levels of glutathione (GSH), superoxide dismutase (SOD) and total protein levels. On the other hand, BBR nanomicelles (50 mg/kg, p.o.) and silymarin (100 mg/kg, p.o.) markedly decreased the serum levels of AST and ALT while enhanced GSH level. In addition, BBR nanomicelles (50 mg/kg, p.o.), silymarin (100 mg/kg, p.o.) and BBR (100 mg/kg, p.o.) groups showed a considerable increase in SOD levels. BBR nanomicelles (50 mg/kg, p.o.) significantly lowered TNF-α level. In addition, nanoBBR group prevented liver cirrhosis in histopathologic analysis.

Conclusions: Therefore, formulation of BBR nanomicelles may represent a good approach to enhance the effect of BBR in liver injuries.

Key words: Bile duct ligation; nanoberberin; berberin; hepatoprotection; oxidative stress; Rat.