Hepatoprotective Effects of Curcumin-Piperin-Nano-Conjugate against Chemically Induced Hepatocellular Carcinomain Rats

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Hepatocellular Carcinoma (HCC) has become a major cancer type in the world with high mortality due to a lack of effective therapies and late diagnosis. Curcumin is the main bioactive compound found in *Curcuma longa* (Turmeric) and has known medicinal properties including anti-carcinogenic effects. Hence, this study was designed to evaluate the hepatoprotective effects of curcumin-piperin-nano-conjugate (CPN) against chemically induced liver cancer in rats. Twenty-four male Wistar rats were divided into four groups including healthy control, HCC control, HCC+CPN low dose and HCC+CPN high dose group. In the HCC group a single intraperitoneal injection of diethylnitrosamine (DEN) at 30 mg kg^{-1} body weight (BW) and thioacetamide (TAA) at 50 mg kg^{-1} BW once in three days were given for seven weeks. Two doses of curcumin (low: 100 mg kg^{-1} BW and high: 200 mg kg^{-1} BW) were gavaged with two HCC groups. Changes in body weights and liver weights, body weight gain (BWG), liver index (LI), gross pathology/histopathology of livers and serum liver enzymes (ALP, AST, ALT) were evaluated after seven weeks. Final body weights and liver weights were not significantly differed from the healthy control group ($p<0.05$). BWG and LI were significantly reduced in HCC+CPN high dose group ($p<0.05$) reflecting the positive effect of high dose CPN. Histopathologically, the HCC group showed large areas of neoplastic hepatocytes nodulation (65% of the liver area). HCC+CPN low dose showed neoplastic nodules in 45% of the liver area. CPN high dose showed neoplastic proliferation only in 25% of the liver area. Moreover, CPN 100 mg kg^{-1} BW dose reduced serum liver enzymes levels indicating a high antioxidation effect. Overall, our results reflect the hepatoprotective effect of new CPN complex against HCC warranting further investigations.

Keywords: *Curcumin, Chemically-induced Liver Cancer, Liver Enzymes, Hepatoprotective Effect*