

## **Chemopreventive and Therapeutic Efficacy of *Salsola inermis* Extract against N-Nitrosodiethylamine-Initiated and Phenobarbital-Promoted Hepatocellular Carcinogenesis in Wistar Rats**

**Authors :** Ahlam H. Mahmoud, Samir F. Zohny, Ibrahim H. Boraia, Faten S. Bayoumic, Eman Eissa

**Abstract :** Hepatocellular carcinoma is one of the most common cancers worldwide and is known to be resistant to conventional chemotherapy. Therefore, we aimed to assess the *Salsola inermis* extract as a novel chemopreventive and/or therapeutic agent against N-nitrosodiethylamine (DNE)/phenobarbital (PB)-induced hepatocarcinogenesis in rats. Adult male Wistar albino rats were divided into five groups: group 1 rats were served as normal controls; group 2 rats were injected intraperitoneally with *S. inermis* extract (100 mg/kg body weight/day) for 20 weeks; group 3 rats were subjected to two-phase hepatocarcinogenic regimen (initiation of hepatocarcinogenesis was performed by a single intraperitoneal injection of DEN at a dose of 200 mg/kg body weight, 2 weeks later, the carcinogenic effect was promoted by supplementation of rats with 0.05% PB for 16 weeks); group 4 rats were injected intraperitoneally with *S. inermis* extract 2 weeks prior to the injection of DEN, the daily injection of *S. inermis* extract was then continued for 18 weeks along with two-phase hepatocarcinogenic regimen (chemoprevention group); and group 5 rats were subjected to the two-phase hepatocarcinogenic regimen, and then, the animals were injected intraperitoneally with *S. inermis* extract for 4 weeks (treatment group). The activities of serum liver enzymes and levels of total bilirubin, conjugated bilirubin,  $\alpha$ -fetoprotein, vascular endothelial growth factor (VEGF) and soluble intercellular adhesion molecule-1 (sICAM-1) in serum were decreased in chemopreventive and treated rats compared with DEN/PB-administered rats. Interestingly, the serum levels of total protein and albumin were normalized in chemopreventive and treated rats. Moreover, the majority of chemopreventive and treated rats showed an almost normal histological pattern of liver. In conclusion, *S. inermis* extract possessed chemopreventive and therapeutic activities against hepatocarcinogenesis in rats partially through the inhibition of VEGF and sICAM-1.

**Keywords :** *Salsola inermis* extract, hepatocarcinogenesis,  $\alpha$ -fetoprotein, VEGF, sICAM-1

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