Research Article

Hepatoprotective Role of Ethanolic Extract of Vitex negundo in Thioacetamide-Induced Liver Fibrosis in Male Rats

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The hepatoprotective activity of ethanolic extract from the leaves of Vitex negundo (VN) was conducted against thioacetamide-(TAA-) induced hepatic injury in Sprague Dawley rats. The therapeutic effect of the extract was investigated on adult male rats. Rats were divided into seven groups: control, TAA, Silymarin (SY), and VN high dose and low dose groups. Rats were administered with VN extract at two different doses, 100 mg/kg and 300 mg/kg body weight. After 12 weeks, the rats administered with VN showed a significantly lower liver to body weight ratio. Their abnormal levels of biochemical parameters and liver malondialdehyde were restored closer to the normal levels and were comparable to the levels in animals treated with the standard drug, SY. Gross necropsy and histopathological examination further confirmed the results. Progression of liver fibrosis induced by TAA in rats was intervened by VN extract administration, and these effects were similar to those administered with SY. This is the first report on hepatoprotective effect of VN against TAA-induced liver fibrosis.

1. Introduction

Liver is a vital organ of metabolism and excretion in the body. It is involved in the biochemical conversions of varied administered substances which significantly increased the reactive oxygen species generation [1]. These liberated radicals can be produced by hepatotoxins, such as thioacetamide (TAA). Several investigations have approved that single dose of this hepatotoxic agent could produce centrilobular hepatic necrosis, and chronic administration led to cirrhosis [2].

Although the modern medicinal system has developed phenomenally, discovering a new drug for treating liver diseases is still a dream. Therefore, a number of therapeutic plants are used in the traditional system of medicine for the management of liver disorders. However, many of them have not been investigated for their effects. VN is one such medicinal plant credited with numeral curative qualities validated by modern science and used since ancient times. VN belongs to a family of Verbenaceae and commonly called five-leaved chaste tree [3]. It is mainly distributed in tropical to temperate regions, especially in India [4], which is traditionally used by the native medical practitioners for the treatment of various ailments, including stomach-ache, disease of the eye, inflammation, enlargement of spleen, bronchitis, asthma, and painful teething in children [5].

The leaves are aromatic, tonic, and vermifuge [6]; the juice from the leaves was used for the treatment of ulcers and swelling of joints [7]. Preliminary phytochemical screening of the extract and literature survey shows the presence of alkaloid, flavonoids-like flavones, luteolin-7-glucoside, casticin, iridoid, glycosides, an essential oil, and other constituents like vitamin C, carotene, glucononital, benzoic acid, β-sitosterol, and glycoside [3]. The literature reviews reveal that the plant VN possesses analgesic and antinociceptive activity [8], hepatoprotective activities against antitubercular drugs [3], CCl4 [9], and ibuprofen via inhibition of lipid peroxidation [10].