



## Modulation of liver enzymes by an Iranian preparation of *Echinacea purpurea*

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### Abstract

Hepatitis B, a common infectious disease of liver, is transmitted by blood and body fluids like semen and vaginal fluid that carry hepatitis B virus (HBV). In chronic infection, medical care is required to decrease possibility of cirrhosis and liver cancer. In the present report, the hepatoprotective effect of an *Echinacea purpurea* preparation (Echiherb<sup>®</sup>) has been described in a patient who suffered from HBV infection. The levels of both enzymes of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) decreased to their normal level after 6 weeks of treatment. Therefore, this report may provide a new perspective for protection of liver in patients with HBV infection along with other diseases which damage liver cells using *E. purpurea* preparations.

**Keywords:** ALT, AST, Echiherb<sup>®</sup>, *Echinacea purpurea*, HBV

### Introduction

*Echinacea purpurea* (L.) Moench (Asteraceae) is one of the most popular medicinal plant in the world, which has been mainly used for prevention and treatment of infections in both upper and lower respiratory system [1,2]. The plant or its preparations are believed to possess immune-stimulation activity regarding to the secondary metabolites including alkamides, ketoalkenes, caffeic acid derivatives, polysaccharides and glycoproteins [3,4].

Hepatitis B is the most common infectious disease of liver caused by hepatitis B virus (HBV) transmitted by blood and body fluids like semen and vaginal fluid [5,6]. Patients with HBV do not usually require treatment, since most

adults clear the infection and produce protective antibodies [7]. On the other side, medical care in the case of chronic infection is required to decrease possibility of cirrhosis and liver cancer [8]. In the present article, the beneficial effect of an *E. purpurea* preparation (Echiherb<sup>®</sup>) produced in Iran, has been reported in a patient who suffered from HBV infection. It seems that reporting of such case is critically important for further investigations on the plant to conduct clinical trials and prove its efficacy in HBV treatment.

### Methods

By the time, a 32-years-old woman (65 kg

weight) complained of recurrent upper respiratory infection (URI), who concomitantly suffered from HBV, but she had not already informed her physician about the HBV infection. She had been advised by her physician to take an *E. purpurea* preparation (Echiherb<sup>®</sup>) for her complaints of recurrent respiratory infection: one tablet per day for 2 weeks followed by prophylaxis treatment of two tablets per week for 4 weeks.

In HBV, damage of liver cells due to a viral hepatitis elevates the levels of both enzymes of aspartate aminotransferase (AST) and alanine aminotransferase (ALT) in the hematologic test [9]. The levels of AST and ALT in her blood sample were assessed about 1000 IU/L before any medical or dietary intervention. The respective levels of mentioned enzymes decreased to the 600 and 550 IU/L for ALT and AST, using dietary regimen including carbohydrates, fruits, vegetables and low fat regimen. Before any treatment, the ratio of AST/ALT was found below 1.0 along with the high level of the enzymes, which proved a viral hepatitis [10]. Presence of hepatitis B surface antigen (HBs Ag), hepatitis B envelop antigen (HBe Ag), and IgM Anti hepatitis B core antigen (HBc) stabilised the diagnosis of acute hepatitis for the patient, while hepatitis B envelop antibody HBe Ab was negative. HBe Ag indicated high level of virus replication and reflected the presence of circulating intact virions [10]. Furthermore, mild increase in total bilirubin (2.5 mg/dL) was observed in the patient blood sample. After 6 weeks of treatment with Echiherb<sup>®</sup> the levels of ALT and AST have been evaluated 50 and 45 IU/L, respectively. The patient informed the physician about her hepatitis infection when the liver enzymes have become normal. She has not taken any other medicines during her disease or concomitantly with Echiherb<sup>®</sup>-tablets, therefore decrease in the levels of the mentioned enzymes may be related to the *E. purpurea* preparation. Each tablet contained 114 mg *E. purpurea* extract equal to 0.41-0.50 mg quercetin equivalent.

## Discussion

In this original report, the beneficial effect of *E. purpurea* preparation (Echiherb<sup>®</sup>) in a patient with HBV infection has been provided for the first time. The levels of ALT and AST enzymes were decreased followed by using Echiherb<sup>®</sup> tablets for 6 weeks. The results of some studies asserted that *Echinacea* plants are potentially liver toxic due to the existence of pyrrolizidine alkaloids with 1,2-saturated necrine ring, which is responsible for the toxic properties of pyrrolizidine alkaloids toward liver cells [11]. However, pyrrolizidine alkaloids in *E. purpurea* have not exhibited toxicity in liver cells [12], due to the lack of 1,2-saturated necrine ring in their structures. Although, it is advised that the plant and its preparations should not be administered more than 8 weeks or with other hepatotoxic agents like some drugs including methotrexate, anabolic steroids, and ketoconazole [11] the mechanism of this phenomenon is not clarified. On the other hand, it is reported that the chloroform extract of another species, *E. pallida*, intoxicated the liver of albino male Wistar rats with beneficial hepatoprotective effects like reduction in histological changes, decrease of enzymes and steatosis modifications [13]. This report may provide a new vista for medicinal intervention in patients with HBV infection along with evaluation of advantages of the *E. purpurea* preparation in protection of liver cells in patients who suffer from the HBV infection or other diseases which damage liver cells in future studies. More studies are needed in this area to determine the potential of this preparation in liver diseases.

## Declaration of interest

The authors declare that there is no conflict of interest. The authors alone are responsible for the content of the paper.

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