Study of Hepatoprotective effect of aqueous extract of humulus lupulus on CCl4 induced liver damage in wistar rat

Abstract

Background: The liver is one of the most important organs in the body and the place of metabolism of most drugs and toxins. Therefore, any damage to the liver can disrupt its function and cause various diseases. On the other hand, due to the increasing use of herbs, in this study, the effects of hepatic protection of aqueous extracts of humulus lupulus on liver damage induced by carbon tetrachloride in rats were investigated.

Aim: Study of Hepatoprotective effect of aqueous extract of humulus lupulus on CCl4 induced liver damage in wistar rat.

Materials and Methods: In this experimental study, 36 male Wistar rats were divided into 6 groups (n=6). Group 1 (normal control) and Group 2 (control CCl4): administered with distilled water orally for 14 days. Groups 3, 4, and 5 were respectively administered with 50, 100, and 200 mg/kg of humulus lupulus extract for 14 days. Group 6: administered with silymarin (as standard drug) 100 mg/kg orally for 14 days. All of groups except group 1 received 1 ml CCl4 (1:1 v/v dissolved in olive oil) on 14^{th} day. Group 1 received only 1 ml/kg of olive on 14^{th} day.

Results: administration with CCl4 alone capable to the increased serum level of ALT, AST, ALP, TAG, and Total Bilirubin but it had no effect on TC,GGT, LDL-C and direct bilirubin. It also caused a decreased serum level of HDL-C, Albumin and Total Protein when compared to control group. Pretreatment with a humulus lupulus extract capable significantly reduced serum levels of ALT, AST, ALP, TG, Total Bilirubin and increased serum levels of HDL-C, Albumin and Total Protein when compared to control group but did not have a significant effect onTC and GGT, direct bilirubin and LDL-C levels. On the other hand, intraperitoneal injection of carbon tetrachloride increased the amount of MDA and decreased the amount of TAC compared to the normal control group. In pathological specimens, carbon tetrachloride injection infects liver walls and also damages hepatocytes, including cell nuclei (dense cell nucleus in the form of a dark, round mass smaller than a true cell), cell vacuolation, and lymph node infiltration. However, pretreatment with some doses of humulus lupulus extract was able to moderate the changes in the evaluated parameters to some extent.

Conclusion: The results of this study showed that humulus lupulus extract can protect the liver against oxidant compounds and free radicals produced by carbon tetrachloride metabolism.

Keywords: Liver damage, Carbon tetrachloride, humulus lupulus,MDA