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HEPATOPROTECTIVE HERBAL MEDICINAL PLANTS: AN REVIEW

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ABSTRACT

Liver injury is major health problems about more than 900 drugs implicated in case of liver injury. Hepatotoxicity is caused by the alcoholic consumption, toxic substances and certain drugs which produce injury to liver such as-carbon tetra chloride, Thioacetamide, high doses of Paracetamol, anti-tubercular drugs, chemotherapeutic agents and some of organic and inorganic compounds etc. World health organization estimate that 80% of total population used herbal medicine for some aspect of primary health care without any side effects. In the case of liver disease or severe liver damage, most of the liver cells destroy Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other oxidative damages in liver or turn into fibrotic state. Some hepatoprotective herbal medicines prevent liver injury caused by hepatotoxicity. More herbal therapy to treat various liver disorders .The Present review is aimed at compiling data on different medicinal plants that have been tested in hepatotoxicity models using modern scientific system.

Key Words: Hepatotoxicity, Hepatoprotective medicinal plants, Liver

INTRODUCTION

The most important organs like Liver regulate various physiological processes and play major role in metabolism and have a number of functions in body, including glycogen storage Decomposition of red blood cells, plasma protein synthesis, hormone production and detoxification [1]. Hepatotoxicity is the major health problem in world. Hepatotoxicity is the capacity of chemicals, drugs or other exposure to produce injury to the liver. Some of the inorganic or organic compounds produce hepatotoxicity. Inorganic compounds are arsenic, phosphorous, copper, and iron.

Moreover, Organic compounds include naturally occurring plant toxins like mycotoxins, bacterial toxins and pyrrazolidine alkaloids. Drug and environmental toxicants enter the hepatic portal vein from the digestive system and liver function can be altering by the injury result from acute and chronic exposure to toxicants. Liver injury or liver dysfunction is a major health problems .It caused by alcohol consumption, toxic substances and certain drugs such as carbon tetra chloride, Thioacetamide high doses of paracetamol, rifampicin, isoniazid, and certain chemotherapeutic agents etc., chronic alcohol consumption and microbes is well studied [2] . Liver damage associated with cellular necrosis, increase in tissue lipid peroxidation and depletion in tissue GSH level [3]. Most of the hepatotoxic chemicals damage liver cells mainly by inducing lipid peroxidation and other oxidative damages in liver. During metabolism of ethanol, enhance lipid peroxidation result, development of hepatitis leading to cirrhosis cause death. Drug-induced liver injury may account for as many as 10percent of hepatitis cases in adults overall, 40 percent of hepatitis cases in adults over fifty years old, and 25percent of Cases of fulminant liver failure. Herbal drugs have gained popularity and much importance in recent years because of their safety, efficacy and cost effectiveness as well as better compatibility. According to world health organization, 80% of the world population relies on the use of traditional medicine, which depends on herbal Plant materials [4]. Although 7,000 different medicinal herbs and 95 species estimated 2, 50,000 flowering plants and their parts are utilized in western medicines. Chinese medicines used 5,000 different plants in their healing system. Several Indian traditional system used in the medicine or herbals formulation for prevent and management liver disorders. The Indian Traditional Medicine like Ayurveda, Siddha and Unani are predominantly based on the use of plant materials. The association of medical plants with other plants in their habitat also influences their medicinal values in some cases [5].

The use of natural remedies for the treatment of liver diseases has a long history and Medicinal plants and their derivatives are still used all over the world in one form or the other for this Purpose. Hepatoprotective plants contain a deferent variety of chemical constituents like phenols, coumarins, lignans, essential oil, monoterpenes, carotenoids, glycosides, flavonoids, organic acids, lipids, alkaloids and xanthenes [6]. Hepatoprotective herbal drug based on therapeutic effect for liver disorder used long time. Therefore, large number of herbal formulation has been claimed hepatoprotective activity. Development of plants based hepatoprotective drugs given importance in global markets.

Reported Hepatoprotective Medicinal and Aromatic Plants

Hepatoprotective medicinal or herbal plants has been use in India and significant develop for long time. Which are valuable source as a hepatoprotective and its uses evaluated and proved by many researchers? The Present review is aimed at compiling data on different medicinal plants that have been tested in hepatotoxicity models using modern scientific system.

Aegle marmelos

Hepatoprotective effect of ethanolic extract of *Aegle marmelos* against carbon tetra chloride induce liver damage in mice investigated. The extract was posses' significant effect on activities of enzymatic antioxidants like Gpx, SOD and catalase. Extract of *A. marmelos* and silymarin effectively scavenge free radicals in the mouse [7].

Silybum marianum

Hepatoprotective activity of polyphenolic extracts of *Sily-bum marianum* and *Cichorium intybus* against thioacetamide- induced hepatotoxicity in rat was investigated on the treatment of extract in rats, at a dose of 25 mg/kg body weight together with thioacetamide at a dose of 50 mg/kg body weight. Significant decrease in the activity of aminotransferase, alkaline phosphatase and bilirubin was observed in the groups treated with extracts and thioacetamide compared with the group that was treated only with thioacetamide. The level of Na+, K+ and liver weight between different groups was not significantly altered. Due to presence of flavonoids and antioxidants it show hepatoprotective effect of extract *Silybum marianum* and *Cichorium intybus* on liver cells [8].

Commiphora opobalsamum

Hepatoprotective effect of ethanolic extract of *Commiphora opobalsamum was* evaluated in carbon tetra chloride induce hepatotoxicity in rats was investigated. Extract possess significant protective effect by lowering serum transaminase levels (serum glutamate oxaloacetate transaminase and serum glutamate pyruvate transaminase), alkaline phosphatase and bilirubin.

Pretreatment with an extract of Balessan prevented the prolongation of the barbiturate sleeping time associated with carbon tetrachloride-induced liver damage in mice. Therefore, the possible hepatoprotective mechanism of Balessan extract on CCl4-induced liver injuries may be due to the following factors: (i) inhibition of cytochrome P-450 activity; (ii) prevention of lipid

peroxidation; (iii) stabilization of the hepatocellular membrane; and (iv) enhancement of protein synthesis [9].

Allium sativum

Allium sativum and silymarin was show hepatoprotective effect against anti-tubercular drugs induce hepatotoxicity model in wistar rats. In this study, the drug (INH) induced hepatotoxic effect has been observed in the group B rats receiving INH. The abnormal rise in the levels of serum ALT, AST, ALP and total bilirubin has been observed in the group B (receiving INH 50 mg/kg per day each) as compared to the group a receiving only the standard diet. The elevated levels of these biochemical markers in the serum are the indicators of hepatotoxicity .On the other hand the hepatoprotective effect of garlic and silymarin has been observed in the group C (receiving INH and milk thistle200 mg/kg/day) and D (receiving INH 50 mg/kg per day each and 0.25 g/kg per day of garlic) respectively. In this study, it has been shown that INH induced hepatotoxicity was prevented by the use of garlic and silymarin along with INH [10].

Eclipta alba

Eclipta alba are used as expectorant, antipyretic, antioxidant and antiasthmatic and also it is hepatoprotective drug. Study shown hepatoprotective activity of *Eclipta alba* against carbon tetrachloride induce liver damage in mice. Treatment with ethanolic extract was found protective effect in the mice [11].

Leucas lavandulaefolia Rees

Hepatoprotective activity of ethyl acetate extract of *Leucas lavandulaefolia Rees* (Labiatae) against carbon tetra chloride induces hepatotoxicity in rats. Decrease in serum bilirubin after treatment with the extract in liver damage indicated the effectiveness of the extant in liver damage indicated the effectiveness of the extract in normal functional status of the liver. The phytochemical studies revealed the presence of flavonoids in ethyl acetate extract of *L.lavandulaefolia* various flavonoids have been reported for their hepatoprotective activity. Hepatoprotective effect of *L.lavandulaefolia* may be due to its flavonoid content [12].

Cissus quadrangularis

Hepatoprotective activity of methanolic extract of *Cissus quadrangularis* against isoniazid induces hepatotoxicity in rats. Protective effects of *cissus quadrangularis* by lowering the elevated level of Aspartate transaminase level, alanine transaminase, alkaline phosphtase and bilirubin. The major

mechanisms responsible for the hepatoprotective effect of c.q which may be due to presence of phytochemical constituents and antioxidant Properties [13].

Tinospora cordifolia

The hepatoprotective activity of *Tinospora cordifolia* against carbon tetrachloride induce hepatic damage in rats was study. The extract of pet ether, ethanol and aqueous extracts of various parts of the plants such as leaf, stem and root were tested at the dose of 200mg/kg body weight orally using wistar albino rats and silymarin was given as reference standard drugs which showed significant hepatoprotective effect by reduction in serum enzymes alanine aminotransferase (ALT), aspartate aminotransferase (AST), alkaline phosphatase (ALP) and total bilirubin from the plant, chemical constituents reported belong to different classes such as alkaloids, flavonoids, glycosides, steroids, terpenoids, phenolic .due to presence of these compound herbal extract of *Tinospora cordifolia* posses hepatoprotective effect [14].

Ficus carica

Hepatoprotective activity of methanolic extract of *Ficus carica Linn.*(Moraceae) Against carbon tetra chloride induce hepatotoxicity in rats. The extract at an oral dose of 500 mg/kg exhibited a significant protective effect by lowering the serum levels of aspartate aminotransferase, alanine aminotransferase, total serum bilirubin,and malondialdehyde equivalent, an index of lipid peroxidation of the liver. The methanolic extract shows the most significant hepatoprotective activity comparable with standard drug silymarin [15].

Cassia fistula

Hepatoprotective activity of the n-heptane extract of *Cassia fistula* (Fabaceae) leaves was reported by inducing hepatotoxicity with paracetamol in rats. The treatment extract at a dose of 400 mg/kg body wt. exhibited orally, it show significant protective effect by lowering the serum levels of transaminases (SGOT and SGPT), bilirubin and alkaline phosphatase (ALP). The effects produced were comparable to that of a standard hepatoprotective agent [16].

Hemidesmus indicus

Methanolic extract of root of *Hemisdesmus indicus* (Asclepiadacea) was evaluated against carbon tetra chloride and paracetamol induce hepatotoxicity in rats. Maximum protection by methanolic extract of *H. indicus* against ccl4 induce hepatic damage was posses at the dose 250mg/kg. The effects produce comparable with standard drug silymarin [17].

Mimosa pudica

Hepatoprotective activity of methanolic extract of *Mimosa pudica* (Mimosaceae) was inducing hepatotoxicity against carbon tetrachloride in rats at the dose of 200mg/kg body weight per oral. Methanolic extract showed significant ($p<0.05$) hepatoprotective effect by lowering the serum levels of various biochemical parameters such as serum glutamic 0xaloacetate transaminase (SGOT), serum glutamic pyruvates transaminase (SGPT), alkaline phospatase (ALP), total bilirubin (TBL), total cholesterol (CHL) and by increasing the levels of total protein (TPTN) and albumin (ALB), in the selected model. These biochemical observations were confirmed by histopathological examinations of liver sections and are comparable with the standard hepatoprotective drug Silymarin (100mg/kg body weight i.p.). Methanolic extract of plant *Mimosa pudica*, may be responsible for the significant hepatoprotective activity and the results justify the use of *Mimosa pudica* as a hepatoprotective agent [18].

Azadirachta indica (Neem)

Azadirachta indica are the antibacterial, anti-inflammatory drugs and hepatoprotective drug. Hepatoprotective effects of *A. indica* leaf (Meliaceae) against paracetamol induce hepatotoxicity in rats. These extract on serum enzyme levels (glutamate oxalo acetate transaminase, glutamate pyruvate transaminase, acid phosphatase and alkaline phosphatase) elevated by paracetamol in rats was studied with a hepatoprotective effect of this plant. The extract was protected in treated group from hepatic cell damage caused by induction paracetamol .These findings effects were further confirmed by histopathological study of liver. Due to an alteration in the biotransformation of the toxic substances resulting in decreased formation of reactive metabolites [19].

Conclusion

The present folklore review has to focus on different types of herbs. Which are traditionally used as hepatoprotective? These herbal drugs have shown the ability to maintain the normal functional statues of the liver with or without fewer side effects and medicinal plants may offer new alternatives to the limited therapeutic options that exist at present in the treatment of liver diseases or their symptoms, and they should be considered for future studies. Presented review suggests that biologically active molecules derived from herbal extracts may serve as suitable primary compounds for effective and targeted Hepatoprotective drugs.

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