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Medicinal Herbs with Hepatoprotective Properties

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Introduction

Hepatic dysfunction results in inflammation and deposition of fat molecules in the liver. The possible side effects of synthetic drugs arose the need for plant derived liver care products and pharmaceuticals. Hepatic dysfunction is a major health concern resulting in jaundice, hepatitis, abdominal pain, nausea, vomiting and over time resulting in cirrhosis. Liver diseases are steadily increasing over the years and World Health Organisation (WHO) has projected it as the eleventh most important cause of death in the world by 2030 and may be the tenth most common cause of death.

Liver, the largest organ in the human body performs many metabolic functions. Alcoholism is the major cause affecting liver function. Not only alcohol, addiction to junk foods, excessive use of drugs, lack of exercise and some viruses Hepatitis A, B, C, D and E can also causes liver problems. Both alcoholic and non-alcoholic causes results impairment in serum enzyme levels namely, alanine transaminase (ALT), aspartate transaminase (AST), alkaline phosphatase (ALP) and gamma-glutamyl transpeptidase (GGT). Proteins namely, globulin, albumin, prothrombin and bilirubin pigment levels also gets impaired and results in inflammation and deposition of fat molecules in the liver known as steatosis which may lead to liver cancer [1].

Description

Livercare is a challenge for healthcare professionals and scientists. Traditional health care practice of indigenous people concerning to human health is termed as ethnomedicine. Hence, folkloric herbs with hepatoprotective potentials have gained considerable attention. A few medicinal plants with proven heptoprotective activity viz., the whole plant parts of *Tephrosia purpurea* (L.) Pers. and *Phyllanthus niruri* L., leaves of *Andrographis paniculata* (Burm. F.) *Nees*. and *Indigofera tinctoria* Linn., rhizomes of *Curcuma longa* L., and fruits of *Punica granatum L*. and *Nigella sativa* L.

True Indigo: *Indigofera tinctoria* Linn

Indigofera tinctoria, commonly called as true indigo, is the major source of indigo dye. Its leaves are arranged spirally, imparipinnate with 9-13 leaflets and has red/ pinkish papilionaceous flowers in axillary racemes. Its leaves are a major ingredient in Neelibringhadi hair oil. Palliyar tribes used its leaf infusion along with goat's milk for the treatment of jaundice. The leaves are benefited in curing liver disorders due to the compound indigtone. Its efficiency for damaging human liver carcinoma cells was proved *in vitro* '[2].

Turmeric: *Curcuma longa L*

Curcuma longa commonly called as turmeric is a rhizomatous herbaceous perennial containing anticancerous compound curcumin. For jaundice treatment, rhizome paste (12-15 g) mixed with cow milk, rhizome extract mixed with *Piper longum* L. fruits are used in folkloric medicine. It's the same anticancerous compound curcumin that imparts hepatoprotective function. Fermented turmeric powder capsule consumption was proved clinically good in normalizing the elevated alanine transaminase levels (ALT). In an *in vitro* study, curcumin showed maximum inhibition of liver cancer cell growth at 50 µM concentration.Recently, *in vivo* hepatoprotective potential of curcuminoids was also identified [3].

Stone breaker: *Phyllanthus niruri* L

Phyllanthus niruri commonly called as stone breaker belonging to the family Euphorbiaceae is an erect, annual herb. Leaves are numerous, sub sessile distichous, elliptic oblong, stipulate and paripinnate with small leaflets. Flowers are very minute, numerous and yellowish in colour. Fruit is a capsule. In folkloric medicine, fresh root extract, plant juice as well as whole plant powder (5g) and fresh leaves mixed with cow or goat's milk is recommended for jaundice.

Phyllanthin, hypophyllanthin and niranthin are the reported hepatoprotective compounds. The hepatoprotective action of epicatechin was proved against D – galactosamine induced hepatitis in rats by lowering the elevated levels of liver enzymes and bilirubin values. Aqueous *Phyllanthus niruri* extract also proved its hepatoprotective action in mice by restoring the elevated liver enzymes levels. In a clinical trial done in patients affected with hepatic steatosis, silymarin/ *Phyllanthus niruri* combination showed significantly better results than silymarin alone, in normalization of the hepatic parameter values [4].

Pomegranate: *Punica granatum* L

Punica granatum belonging to the family punicaceae is a small multi-stemmed shrub or tree whose fruits are hepatoprotective. Traditionally it is used for curing hepatic disorder in the following ways. Powdered fruits, dry rind powder (2 teaspoons) added in water as well as a mix of *Phyllanthus emblica* and anardana powder is found effective for jaundice. Gluconorm - 5 a polyherbal formulation containing pomegranate on administration at 300 mg/ kg concentration is equally effective for curing diabetes and liver disorders. Pomegranate leaf extract also reported both *in vitro* and *in vivo* hepatoprotective potential. A silver nanoparticle formulation using pomegranate leaf extract was developed that could destruct human liver cancer cells.

Black cumin/ Kalonji: *Nigella sativa* L

Nigella sativa commonly called as kalonji belonging to the family ranunculaceae is an annual herbaceous flowering plant whose fruits are hepatoprotective. The fruits commercially called as kalonji seeds is a large and inflated capsule composed of three to seven united follicles, each containing seeds. Dried and powdered kalonji seeds in milk as well as ajwain extract added with kalonji oil gives quick relief from liver problems and jaundice. The powerful hepatoprotective compound reported is thymoquinone. The cytotoxic potential of Nigella sativa seed oil (NSO) was assessed in human liver cancer cell line (HepG2), human breast cancer cell line (MCF-7), human lung cancer cell line (A-549) and human embryonic kidney cell line (HEK293) at different concentrations (50–250 µg/ml). All cancer cells lines are adversely affected by the treatment of *Nigella sativa* seed oil and maximum cytotoxic response

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was observed in HepG2 cells. In acetaminophen toxicity induced rats elevated levels of alanine aminotransferase, aspartate aminotransferase, and alkaline phosphatase could be reduced by kalonji seed extract [5].

Future Perspective

A thorough review of the literature on hepatoprotective plants reveals that herbal medications have significant potential in the treatment of liver ailments. In this post, we looked at the scientific quality of a few plants that have been examined for their hepatoprotective mechanisms. The majority of research has found that countering oxidative stress, which destroys the liver, is the main hepatoprotective mechanism. The effect of extracts and components from various herbs on liver injury has been summarised based on changes in biochemical markers. We also gave the literature's possible phytochemical constituent data for several plants. As a result, we conclude that herbs and herbal preparations are one of the most important sources of hepatoprotective and liver regeneration drugs.

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Conflict of Interest

The author shows no conflict of interest towards this manuscript.

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