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Hepatotoxicity and Hepatoprotectors

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Abstract

The importance of a healthy liver to human health cannot be overstated. Because the liver is involved in practically all biochemical processes and is affected by a variety of disorders. Environmental pollutants, such as eating habits, alcohol, and overdosing on some medicines, are known to harm and weaken the liver, which can lead to a variety of disorders. Hepatoprotective substances can be found in medicinal herbs in large quantities. In the treatment of numerous liver ailments, mono- and poly-herbal formulations have been employed. More than 700 mono and poly-herbal medicines in the form of decoction, tincture, pills, and capsules from more than 100 plants are in therapeutic use, according to one estimate. A total of 178 therapeutic plants were found in the literature review.

The most common parameters used to assess hepatoprotective activity are morphological, such as liver weight and volume, biochemical estimations, such as measurement of transaminase activity, SGPT, SCOT, alkaline phosphatase, serum bilirubin, total serum proteins, albumin, globulin, and prothrombin time, functional parameters, such as pentobarbitone and hexobarbitone sleeping time, and finally histopathological We shall briefly address hepatotoxicity and hepatoprotective agents in this review.

Keywords: Hepatotoxicity; Hepatoprotective agents; Silymarin; Xenobiotics

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INTRODUCTION

The liver is a significant organ found solely in vertebrates that conducts a variety of vital biological tasks, including detoxification and the creation of proteins and biochemicals required for digestion and growth. It is found in the right upper quadrant of the abdomen, below the diaphragm, in humans. Other functions in metabolism include glycogen storage management, red blood cell breakdown, and hormone generation.

The liver is a digestive organ that generates bile, an alkaline fluid that contains cholesterol and bile acids and aids in fat breakdown. The gallbladder, a tiny pouch located directly under the liver, holds bile produced by the liver before being sent to the small intestine for digestion. The highly specialized tissue of the liver, predominantly hepatocytes, controls a wide range of high-volume metabolic activities, including the creation and breakdown of tiny and complex molecules, many of which are required for proper essential functions. The entire number of functions of the organ is estimated to be around 500, according to textbooks.

The liver is a living system's largest and most complex internal organ. Through its numerous and diversified functions, it plays a crucial part in the maintenance of the interior environment. It is involved in the metabolism of proteins, lipids, and carbohydrates in the intermediate state. Proteins, glycogen, different vitamins, and metals are all stored in it. It also aids in blood volume regulation by moving blood from the portal to the systemic circulation, and its reticuloendothelial system aids in immunological mechanisms. It is involved in the detoxification and excretion of a wide range of endogenous and foreign substances. Liver illnesses are a prominent source of illness and death all over the world.

The liver is an important organ that helps practically every other organ in the body function properly. The liver is vulnerable to a variety of disorders due to its strategic position and multifaceted functions. The exposed portion of the liver is prone to infection spreading from the abdominal cavity to the thoracic cavity. Liver function tests, which are blood tests that can identify numerous indicators, can be used to Hepatitis is a disorder in which the liver is inflamed. Hepatitis A, B, C, D, and E are the most prevalent viral infections, with hepatitis A, B, C, D, and E being the most frequent. Some of these illnesses are spread through sexual contact.

Alcoholic liver illnesses include alcoholic hepatitis, fatty liver, and cirrhosis, among other problems induced by excessive alcohol

consumption. Not only does the amount and frequency of alcohol intake have a role in the development of alcoholic liver disease, but so do gender, genetics, and liver damage. Medications, particularly paracetamol and cancer-treatment drugs, can potentially harm the liver. A liver shot used in combat sports can induce a rupture of the liver.

The most prevalent symptom of hepatotoxicity is liver malfunction or damage caused by an excessive amount of medicines or xenobiotics. Hepatotoxicants are exogenous substances that cause liver harm, such as an overdose of some medicinal compounds (acetaminophen, nimesulide, antitubercular medications like isoniazid, rifampicin, etc.) or industrial chemicals (alcohol, CCl4, beta galactosamine, thioacetamide, etc.).

The exact mechanism of drug-induced liver injury is unknown, but it appears to involve two pathways: direct hepatotoxicity (Type A or DILI1), which is an intrinsic or predictable drug reaction and indirect hepatotoxicity (Type B or DILI2), which is an unpredictable or idiosyncratic drug reaction, or an adverse immune response.