

PROPERTIES OF BIOACTIVE SUBSTANCES AGAINST TOXIC HEPATITIS

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Abstract

Liver damage is caused by endogenous or exogenous factors. When the body is exposed to harmful stimuli, an excessive amount of reactive oxygen species is formed and leads to an imbalance between oxidation and antioxidant systems, resulting in oxidative stress. One of the main etiologies of liver damage is oxidative stress. Some plants contain antioxidants such as polyphenols, polysaccharides, carotenoids, lentinan, vitamin C, and vitamin E. These phytochemicals have antioxidant activity, which in vivo purify free radicals and maintain liver health.

Keywords: hepatitis, liver, cells, antioxidant, bioactive compounds.

Introduction

Recently, worldwide liver disease has been increasing year by year. Hepatitis, cirrhosis, liver failure and other liver diseases are common consequences associated with liver disease that have a serious impact on human health. Toxic hepatitis is inflammation of the liver as a reaction to certain substances that affect it. Toxic hepatitis can be caused by alcohol, chemicals, drugs, or nutritional supplements. In some cases, toxic hepatitis develops within a few hours or days of exposure to the toxin. In other cases, regular use may take months before signs and symptoms appear [1,2].

Symptoms of toxic hepatitis often disappear when the toxin effect is stopped. But toxic hepatitis can permanently damage the liver, which leads to irreversible scarring of liver tissue (cirrhosis) and, in some cases, liver failure, which can be life-threatening. Mild forms of toxic hepatitis may not cause any symptoms and can only be detected with a blood test. When signs and symptoms of toxic hepatitis appear, they can include: yellowing of the skin and whites of the eyes (jaundice), itching, abdominal pain in the upper right part of the abdomen, fatigue, loss of appetite, nausea and vomiting, rash, fever, loss of weight, dark-colored or tea-colored urine occurs.

Hepatitis the most common viral hepatitis is a severe / fatal disease. It is estimated that complications of viral hepatitis result in approximately 1-4 million deaths per year worldwide. Typically, a variety of viruses can cause inflammation of the liver, such as Epstein-Barr virus or Herpes simplex virus or cytomegalovirus. However, all types of hepatitis viruses (a, b, c, D and E) refer to the causative agent. Most hepatitis viruses cause acute conditions and go away on their own, but types B, C and E can lead to chronic diseases. Chronic hepatitis can lead to life-threatening conditions such as cirrhosis of the liver or hepatocellular carcinoma. Every year, 1.5 million infections are recorded due to Hepatitis-B and hepatitis-C. Hepatitis viruses such as a, C, D, and e consist of RNA, and hepatitis-B virus consists of DNA. Hepatitis A virus (HAV) spreads through food and water pollution, human feces. Hepatitis-B virus (HBV) shows vertical and specific transmission and can be transmitted through sexual pathways (through vaginal and sperm secretion), blood (through injection, drug use, etc.), as well as from person to person close contact [1].

Bioactive compounds

Essential oils (EOS) are plant-based aromatic oils derived from roots, herbs, fruits, twigs, flowers, pods, leaves, buds, wood and seeds. Some EOS derived from sweet oranges, Rosemary sineols, lemons, and grapefruits (common names *Citrus sinensis*, *Rosmarinus officinalis*, *Citrus lemons*, and *Citrus paradisi*, respectively) have anti-hav effects. Essential oils such as sesquiterpenes, hydrocarbons, and limonene produced by *Citrus* genera are 85% to 99% volatile, containing oxygenated esters, ketones, aldehydes (citral), alcohols (linalool), and acids.

Flavonoids are plant-based products with many clinical functions that have antibacterial anti-cancer and anti-inflammatory effects. It demonstrates a basic function in liver protection, for example, Silymarin is an effective drug developed to protect the liver.

Also known as *Panax ginseng* Meyer, ginseng has been widely used as a medicinal herb for over 5,000 years in Korea and China. It contains many biologically active compounds such as peptides, polysaccharides, ginsenosides, fatty acids, phytosterols, polyacetylene acids and polyacetylene. There are various studies on the biological activity of ginseng, which are used as antifungal, anti-stress, anti-inflammatory, antibacterial, anticancerogenic, anti-viral and antioxidant. Its accumulation is first recorded on the roots of the plant, and traditionally its isolation usually takes a long time [1,3].

Coumarin is a plant-based natural product, first obtained from *Dipteryx odorata* and tonka beans. It is also known as Coumarou and contains many natural coumarins isolated from plants, fungi, bacteria and chemical synthesis. Coumarin is used, along with its derivatives, to synthesize antiviral agents. (2H-chromen-2-ones) are known to be highly bioactive substances for the synthesis of novel agents with high specificity and affinity for many molecular targets. Coumarin derivatives have antioxidant, anti-inflammatory, neuroprotective and anticancer effects. Recently, various derivatives of coumarin have been reported to be active against hav. Phenylpropanoids are usually obtained by plants from the amino acids tyrosine and phenylalanine and contain a wide spectrum of biological activity, such as antioxidant, anti-tumor, liver protection, as well as antiviral. Resveratrol, also known as 3,5,4'-trihydroxystilben, is a naturally occurring phytoalexin. It is often found in plants such as grapes, cranberries, peanuts, etc. It exhibits many biological activities because it is used as a vascular protective, chemopreventive, anti-inflammatory and antioxidant compound [2,3].

Terpenoids are natural compounds with a basic structural unit, such as isoprene. They have an effective biological effect; they consist mainly of antiviral and anti-inflammatory effects.

Conclusion

Recently, in the treatment of hepatitis, more attention is paid to natural remedies due to the subsequent action in chemical preparations and the appearance of medicinal residues. Consequently, it is extremely important to study and refer to effective natural compounds that treat hepatitis and its types, as well as their mechanisms of action. These compounds are a vital source for the synthesis of new drugs for the treatment of hepatitis. They have a variety of bioactivity that can be directly developed or applied as starting points to optimize new drugs. In addition, clinical studies have shown that bioactive products have potential to treat hepatitis, mainly HBV and HCV infections. For this reason, this review can be a solid basis for bioactive compounds used in the treatment of hepatitis.

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