Glycyrrhizin- A Review

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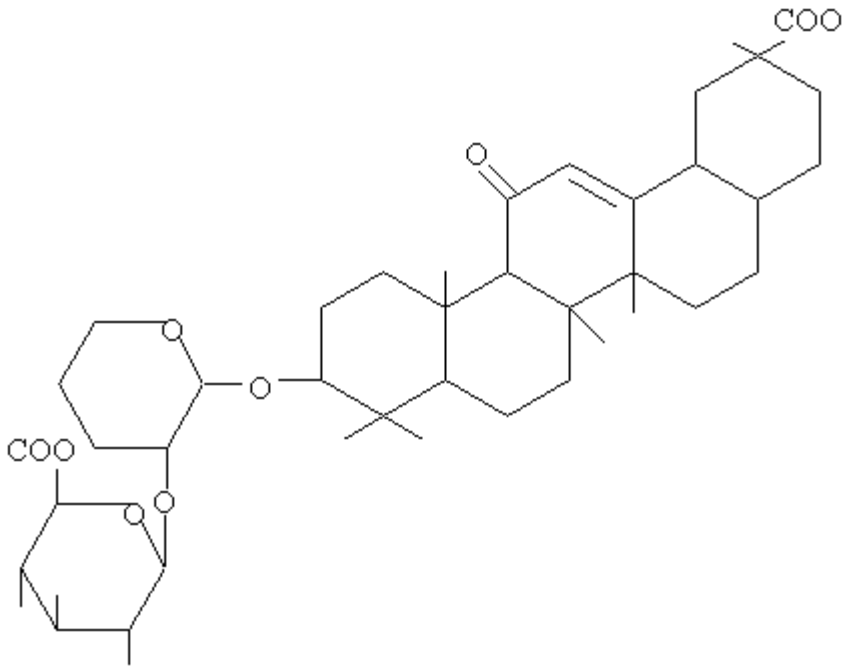
Chemistry

Glycyrrhizin is a triterpenoid saponin found in Glychyrrhiza glabra (licorice). Chemically, glycyrrhizin is a sulphated polysaccharide. It is considered to the active constituent of the drug and the standardization of licorice is based on glycyrrhizin content. The standardized extracts of licorice sold in the market contain 20% of glychrrhizin. Glycyrrhizin is converted into glychyrrhetic acid by an enzyme, glycaronidase.



Structure of Glychyrhizin.

Pharmacological activities

A. Hepatoprotective activity:

Glycyrrhizin has demonstrated heptoprotective activity in animal models against carbon tetrachloride induced toxicity. It reduces alanine transaminase and aspartate transaminase values in serum. The exact mode of action is not clear but it has been proposed that glycyrrhizin has inhibitory effect on immune mediated cytotoxicity against hepatocytes and on nuclear factor (NF)-kappa B, which activates genes encoding inflammatory cytokines in the liver. In addition glycyrrhizin has shown activity in hepatitis and cirrhosis.

B. Anti-viral activity

It has been proven to have antiviral activity against DNA and RNA virus (VZV, HIV, Influenza A and B, types 1 and 2 herpes simplex and hepatitis B and C) in vitro an in vivo. Toxicity has not been found in experimental trials on different cell lines. The Glycyrrhizin acid blocks the first steps on viral replication as well as the viron exit from the capside.

1. Glychyrrhizin and herpes simplex

In an open, controlled, clinical and multicentric study, glycyrrhizin was evaluated for efficacy, safety and tolerability. 52 adults patients of both sexes (males 62.7%, females 37.3%) with age ranging from 18 to 65 years (mean 38.8) with active lesions of genital herpes simplex were included in this preliminary study. Patients the cases were enrolled under clinical, cytologic and immunologic criteria. A local application of the spray solution on the affected area was done twice a day for 5 days. Clinical efficacy was evaluated with no parametric methods. Total efficacy was observed in 95%, it was excellent in 65%, good in 25% and mild in 9%. The natural history was the same, but not so good were the control of pain and pruritus. The immuno-serological evolution was correlated with the clinical history. Local tolerability was of 94.1% and non-important adverse side events were observed.

2. Glycyrrhizin and Anti HIV activity

Anti HIV activity of glycyrrhizin was first explained IN November 1986 in Aids treatment news. After this the other compounds belonging to the category of glycyrrhizin were investigated for Anti HIV activity. A study from Japan explained the use of glycyrrhizin in 10 patients, who were given glycyrrhizin ranging from 150 to 225mg. At the end it was concluded that glycyrrhizin was more effective than placebo in preventing the occurrence of symptoms.

3. Anti-inflammatory effects

The anti-inflammatory activity of glycyrrhizin has been explained by number of researchers but very limited data is available. The activity has been compared with glucocortocoid hormone. The mode of action is slightly different from the hormone. It has been proposed that glycyrrhizin promotes regeneration of inflammatory tissue, whereas glucocorticoid inhibits the regeneration.

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