



**EVALUATION OF THE EFFECT OF SKQ AND LEGALON ON THE
BILE-EXCRETORY FUNCTION OF THE LIVER AND CERTAIN
BIOCHEMICAL PARAMETERS OF BLOOD SERUM IN ACUTE DRUG-
INDUCED HEPATITIS CAUSED BY PARACETAMOL**

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ABSTRACT

In experimental studies, the hepatoprotective properties of the resin (khilkhit) isolated from the rhizome of the *Ferula asafoetida* plant were comparatively studied with the drug Legalon in paracetamol-induced hepatitis. The obtained results demonstrated that the resin of *Ferula asafoetida* prevented the development of cytolytic and cholestatic syndromes, as well as hyperbilirubinemia and hypoproteinemia. It was concluded that further research should be continued in order to create a new hepatoprotective agent and its pharmaceutical dosage form.

Keywords: *Ferula asafoetida*, hepatoprotector, hepatitis, paracetamol, liver enzymes.

INTRODUCTION

Medicinal plants are considered an invaluable source for the development of new effective drugs for the treatment of liver diseases. In addition, medicinal plants have advantages over many synthetic drugs because they are less harmful to the human body and have minimal side effects. Scientific studies aimed at evaluating the efficacy and safety of medicinal plants make it possible to expand the arsenal of therapeutic agents used in the treatment of various liver diseases.

The scientific significance of the study lies in the fact that substances contained in the roots of *Ferula asafoetida* L. stimulate the external secretory



function of the liver when administered orally and demonstrate pronounced hepatoprotective activity in acute hepatitis of various etiologies. These substances are capable of reducing disturbances in the chemical composition of bile, alleviating cytolytic and cholestatic syndromes, and eliminating hyperbilirubinemia and hypoproteinemia.

MATERIALS AND METHODS

To study the preventive effect of SKQ and Legalon in acute paracetamol-induced hepatitis (APIH), experimental rats were randomly divided into the following groups:

Control group – Rats received distilled water intragastrically for two days before induction of the APIH model. Paracetamol was administered once daily at a dose of 1500 mg/kg for two days.

Experimental groups 2 and 3 – Rats with APIH received SKQ intragastrically at doses of 50–100 mg/kg once daily for two days before administration of paracetamol.

Group 4 – Rats with APIH received Legalon (comparison drug) intragastrically at a dose of 100 mg/kg once daily for two days, one hour before administration of paracetamol.

Intact group – No manipulations were performed on rats in this group.

The test substances were administered according to the “prophylaxis + paracetamol” scheme. On the third day of the experiment, all groups except the intact group were induced with acute drug-induced hepatitis one hour after administration of the drugs. Acetaminophen (paracetamol) produced by “Farmstandart-Lekarstva” (Russia) was used at a dose of 1500 mg/kg once daily for two days.

To determine the therapeutic effect of SKQ and Legalon in acute drug-induced hepatitis, the hepatitis model was first induced, and one day after the final



administration of paracetamol, experimental therapy with the above-mentioned agents was carried out for six days.

RESULTS AND DISCUSSION

Paracetamol is one of the most widely used nonsteroidal anti-inflammatory drugs due to its various therapeutic properties. However, its metabolite N-acetyl-p-benzoquinone imine, which binds glutathione, exerts hepatotoxic and nephrotoxic effects, leading to necrosis of hepatocytes and renal tubules.

At the same time, paracetamol is widely used in pediatric practice as an analgesic and antipyretic agent. In economically developed countries such as the United States and the United Kingdom, paracetamol is among the leading causes of acute liver failure.

Considering the insufficient effectiveness and limited number of drugs used for the pathogenetic treatment of hepatobiliary disorders, the study of the effectiveness of *Ferula asafoetida* in paracetamol-induced hepatitis is of significant theoretical and practical interest.

The conducted studies demonstrated that under the influence of paracetamol, the external secretory function of the liver significantly decreased by 55.7%. A nearly twofold reduction in bile acids (41.1%), cholesterol (44.5%), and bilirubin (50.7%) was also observed. Thus, repeated administration of paracetamol to rats led to a pronounced deterioration in the functional state of the liver.

Therapeutic Effect of SKQ and Legalon on Bile Secretion and Biochemical Composition

Experimental therapy with SKQ demonstrated a pronounced therapeutic effect not only in stimulating bile secretion (101.7%) but also in increasing the excretion of bile acids (46.6%), cholesterol (54.6%), and bilirubin (56.1%). Increasing the dose of the drug to 100 mg/kg did not result in a further increase in effectiveness.

The obtained results indicate that SKQ was somewhat superior to Legalon in terms of effectiveness.



Thus, therapeutic administration of SKQ in paracetamol-induced hepatitis significantly corrected disturbances in the external secretory function of the liver and in the chemical composition of bile.

EFFECT OF SKQ AND LEGALON ON BIOCHEMICAL PARAMETERS OF BLOOD SERUM

As noted above, SKQ exhibited a significant therapeutic effect on liver function impaired by medicinal agents. In clinical practice, a number of biochemical and metabolic tests are used as objective and reliable criteria for assessing the severity of pathology and the effectiveness of treatment.

Therefore, in a separate series of experiments, biochemical studies were conducted to determine the activity of enzymes reflecting the functional state of the liver.

In rats with acute paracetamol-induced hepatitis, the activity of ALT and AST increased by 258.0% and 198.3%, respectively, indicating significant development of cytolytic syndrome. Against this background, alkaline phosphatase activity increased by 173.2% and gamma-glutamyl transferase (GGT) by 74.1%, reflecting the development of cholestatic syndrome.

At the same time, total protein and albumin levels decreased by 21.3% and 23.0%, respectively, indicating the presence of hypoproteinemia. These changes were accompanied by a marked increase in total bilirubin levels in the blood.

Analysis of the experimental data showed that SKQ had a pronounced therapeutic effect. Administration of SKQ at a dose of 50 mg/kg reduced ALT activity by 63.4%, AST by 67.6%, alkaline phosphatase by 46.5%, and GGT by 35.1% compared to untreated animals.

The positive effect of SKQ in eliminating cytolytic and cholestatic syndromes was clearly evident. Moreover, the 50 mg/kg dose was slightly more effective than the 100 mg/kg dose.



In animals treated with SKQ, especially at the 50 mg/kg dose, total protein increased by 22.7% and albumin by 27.3%, indicating restoration of the protein-synthesizing function of hepatocytes. SKQ also significantly reduced jaundice manifestations, which was reflected by an almost twofold decrease in total bilirubin levels.

Similar but slightly less pronounced effects were observed in groups treated with SKQ and Legalon at a dose of 100 mg/kg.

CONCLUSIONS

The gum resin of *Ferula asafoetida* possesses pronounced hepatoprotective properties.

In terms of pharmacological activity, the gum resin of *Ferula asafoetida* is not inferior to the well-known hepatoprotector Legalon.

The hepatoprotective effect of the gum resin is largely associated with suppression of lipid peroxidation processes and improvement of antioxidant system activity.

REFERENCES

1. Oparin A.G., Lavrova N.V., Blagoveshchenskaya A.V. Hepatoprotectors: tactics of clinical application. Eastern European Journal of Internal and Family Medicine. 2016;1:75–81.
2. Vyalov S.S. Liver damage and associated pathology: rational combination of hepatoprotectors. Russian Medical Journal. 2013;31:15–23.
3. Matveev A.V. Hepatoprotectors. Analysis of international studies on liver drugs. Simferopol: Arial; 2013.
4. Zvyagintseva T.D., Chernobay A.I. Chronic liver diseases: focus on multicomponent herbal antioxidant hepatoprotectors. Modern Gastroenterology. 2014;4:70–76.
5. Ilchenko L.Yu., Korovich T.I. Drug-induced liver disease and the role of hepatoprotectors in therapy. Medical Council. 2013;10:32–37.