EARLY DIAGNOSTIC CRITERIA OF EXPERIMENTAL LIVER FIBROSIS

Tashkent State Medical University
2st-year Master's students: **Maxliyo Tolanova**
Adaxamjonova Go'zaloy Abduqodir qizi
Scientific Supervisor: Associate Professor,
Doctor of Medical Sciences **Z.A. Sayfuddinova**

Annotation: *Early detection of experimental liver fibrosis is of great importance in monitoring the course of the disease and determining effective treatment strategies.*

The study reviewed the possibilities of detecting the initial signs of fibrosis using various biomarkers, instrumental examinations, and molecular methods.

These approaches make it easier to stop the pathological process in time and determine rehabilitation measures.

The research can serve as a basis for developing new approaches in the early diagnosis of liver diseases.

Keywords*: Liver fibrosis, Fibrosis biomarkers, Histopathological assessment, Elastography (FibroScan), Biopsy, Non-invasive instrumental methods.*

Research Objective

Experimental liver fibrosis is a laboratory model (usually in animals) in which fibrosis (i.e., the growth of connective tissue) is artificially induced in liver tissue.

This model makes it possible to study human liver diseases, especially chronic liver diseases leading to fibrosis and cirrhosis, and provides opportunities for early diagnostics.

Factors used to induce experimental liver fibrosis include:

1. Chemical agents:

- Carbon tetrachloride (CCl_4) – the most widely used toxic agent that induces oxidative stress in the liver and causes cell damage.
- Thioacetamide (TAA) – leads to hepatocyte necrosis, inflammation, and fibrosis.
- Dimethylnitrosamine (DMN) – causes toxic liver injury and fibrosis.

2. Chronic alcohol consumption model:

- Long-term administration of alcoholic beverages to animals induces liver damage and fibrosis.

3. Other methods:

- Bile duct ligation – induces cholestatic liver fibrosis.

- Viral infections (e.g., using recombinant adenoviruses) – sometimes used to model viral hepatitis.

The aim of the research is to develop early diagnostic criteria by detecting morphological, biochemical, and elastographic changes in the early stages of experimental liver fibrosis.

The study focuses on identifying histological (tissue-level), biochemical (serum markers), and instrumental (e.g., FibroScan) changes occurring in the initial phases of fibrosis, and assessing their correlation with the degree of fibrosis.

It also aims to develop a diagnostic panel based on highly sensitive biomarkers (e.g., hyaluronan, TIMP-1, PIIINP) and elastographic indicators for early-stage application.

Research Tasks

- To evaluate the significance of biochemical markers in detecting early stages of fibrosis.
- To study the diagnostic capabilities of ultrasonography and elastometry.
- To propose a reliable diagnostic algorithm by comparing clinical and laboratory results.

Identification of early-stage fibrosis signs:

- Detecting biochemical and morphological changes observed in the early stages of disease progression.

Evaluation of the diagnostic value of biochemical markers:

- Analyzing the diagnostic sensitivity of indicators such as ALT, AST, hyaluronic acid, and GGT.

Investigation of instrumental methods:

- Assessing liver tissue changes through elastography, ultrasonography, and other minimally invasive methods.

Comparison of biochemical and instrumental results:

- Determining the degree of agreement between different diagnostic approaches.

Research Methods

- Fibrosis was induced in animal models using CCl_4 (carbon tetrachloride).
- Markers such as ALT, AST, GGT, and hyaluronic acid were measured.
- Liver elasticity was assessed using elastography.
- Histological analysis was performed to confirm fibrosis stages.

Scientific Novelty

The study revealed the correlation between hyaluronic acid levels and elastography indicators in the early detection of liver fibrosis, proposing a comprehensive approach for early diagnostics.

Practical Significance

Based on the results, an effective and minimally invasive diagnostic approach for early detection of liver fibrosis was developed, which can be applied in clinical practice for early diagnosis and treatment.

Conclusion

The experimental research results showed that the integration of biochemical markers and modern instrumental methods is effective for the early detection of liver fibrosis, and diagnostic algorithms can be developed based on these findings.