Introduction. The degree of liver fibrosis is of great importance for prognosis and therapeutic intervention in chronic liver diseases. However, there is a relative lack of tools and technologies for non-invasive and longitudinal assessment of liver fibrosis in autoimmune hepatitis (AIH). Low sensitivity and specificity of currently available diagnostic options highlight the necessity of fibrosis biomarker identification.
Aim of the study. To analyze the importance of non-invasive biomarkers for liver fibrosis assessment in AIH.
Materials and methods. A scientific review have been performed using HINARI database. Based on search terms "liver fibrosis", "non-invasive tests" and "biomarkers", articles on this topic have been identified and the most relevant ones have been studied.
Results. The extracellular matrix (ECM) may provide options for biomarker identification, as both the content and the composition of the ECM correlate with fibrosis stage. The balance between matrix metalloproteases (MMP) and tissue inhibitors of metalloproteases (TIMP) affects the turnover model of ECM, thus MMP-1, MMP-3, TIMP-1 are applied in non-invasive diagnosis as reliable fibrosis markers. The N-terminal propeptide of procollagen type III (PIIINP) reveals the intensity of ECM synthesis, but its specificity and sensitivity in fibrosis evaluation is considerable higher if associated with hyaluronic acid and MMP. Despite their high applicability and good reproducibility, biomarkers present some limitations in displaying liver fibrosis, because they are not liver specific and unable to discriminate between intermediate stages of fibrosis. On the other hand, transient elastography via liver stiffness measurement can stage hepatic fibrosis, especially with high performance for cirrhosis. However, the accuracy of this non-invasive technique in AIH is still limited due to false positive results in conditions like acute hepatitis, extrahepatic cholestasis, liver congestion, and lower applicability than serum biomarkers in case of ascites or/and obesity.
Conclusions. There is increasing evidence for the prognostic value of both functional and imaging biomarkers as liver fibrosis non-invasive assessment methods in AIH. Certainly, the combination of these different tools will overcome their individual disadvantages and allow a more personalized fibrosis staging.
Key words: liver fibrosis, biomarkers, transient elastography, autoimmune hepatitis.

298. BLOOD EXPRESSION OF OXIDATIVE STRESS

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Introduction. Oxidative stress is a pathogenic mechanism of a number of diseases that affect tissues and organs. The usefulness of the blood markers in the diagnosis of the diseases and/or conditions associated with oxidative stress is substantiated by the blood expression of oxidative stress and the correlation with the intensity of the pathological process in the organs. An indirect marker for oxidative stress is malonic dialdehyde (DAM), the end product of lipid peroxidation triggered by oxidative stress. The assessment of the DAM level could reveal the intensity of the processes and can determine the therapeutic strategy.
Aim of the study. To assess the level of DAM in the blood and the hepatic homogenate of laboratory animals in oxidative stress induced by muscle ischemia/reperfusion in crush syndrome.

Materials and methods. The DAM level was measured by the classical thiobarbituric acid method, described by Vladimirov Iu. (1972), in the hepatic homogenate and erythrocytes of white laboratory rats subjected to muscle ischemia (240 min) and reperfusion (90 min) compared to control (240 min. ischemia) and healthy animals.
Results. Prolonged ischemia (240 min) induced an insignificant ($p > 0.05$) increase in the level of DAM in both the hepatic homogenate (+7%) and in the erythrocyte hemolysate (+9%) in the experimental animals compared to the healthy ones. Removal of the causal factor and reperfusion (90 min) of the compressed muscle tissue did not change the DAM values in the hepatic homogenate, but produced a statistically significant decrease, up to values below those found in the control animals, in erythrocytes (-25%, $p<0.01$). Thus, long-lasting ischemia is associated with an insignificant increase in the end product of lipid peroxidation, which possible confirms the sufficient antioxidant capacity of the liver and erythrocytes, which in the case of blood cells is surpassed by the oxidative explosion conditioned by the reperfusion and the entry of oxygen.
Conclusions. Statistically insignificant changes of DAM content in the liver and erythrocytes of animals with oxidative stress triggered by ischemia/reperfusion attest minor value of DAM as a marker of oxidative stress at late stages of the pathological process.
Key words: malonic dialdehyde, oxidative stress, ischemia/reperfusion, crush syndrome

299. NON-INVASIVE DIAGNOSIS OF HEPATIC FIBROSIS

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Introduction. Hepatic fibrosis is a worldwide health issue, whose prognosis; management and potential treatment depend on establishing the accurate diagnosis according to the progression of the disease. Modern medicine studies efficient, safe and non-invasive methods for the assessment of hepatic fibrosis, such as serum biomarkers and imaging techniques: FibroScan elastometry, MRI, ARFI.
Aim of the study. Identification and study of the non-invasive methods for the diagnosis of hepatic fibrosis
Materials and methods. A bibliographic study of scientific literature from 2009-2020 based on Biomed Central, Bio Predictive, ACS Publications data bases was done, with the following search words – hepatic fibrosis, non-invasive diagnosis, fibrotest, biomarker of fibrosis.
Results. Serum biomarkers, used for the assessment of hepatic fibrosis, are classified in: direct biomarkers – Procollagen type I carboxy-terminal peptide (PICP), Procollagen type III amino-terminal peptide (PIIINP), matrix metalloproteinases (MMPs), tissue inhibitors of matrix metalloproteinases (TIMPs), hyaluronic acid (HA), transforming growth factor β1 (TGFβ1), laminin, connective tissue growth factor (CTGF); and indirect biomarkers – AST/ALT ratio, coagulation factors, platelet count, γ2-macroglobulin, γ2-globulin, γ-globulin, apolipoprotein A1, GGT, total bilirubin. These serum biomarkers are combined in non-invasive scores such as APRI, FibroTest, FIB-4. Transient Ultrasound Elastography or FibroScan measures liver stiffness (elasticity) and allows determining the stage of hepatic fibrosis according to METAVIR score: F1, F2, F3, and F4. MRI can be used to measure hepatic stiffness, and at the same time other associated pathologies.