COMPARATIVE ASSESSMENT OF DIFFERENT DIAGNOSTIC SCORES FOR PREDICTION OF NON-ALCOHOLIC LIVER DISEASE

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Several steatosis risk score was developed in order to optimize identification of persons with NAFLD (fatty liver index - FLI, hepatic steatosis index - HSI).

Our aim was to determine which one is most applicable to our study group.

Materials and Methods. 77 non-smokers with abdominal obesity without cardiovascular diseases, renal diseases, infective, malignant and autoimmune diseases. Anthropometric parameters, markers of glucose and lipid metabolism, serum levels of inflammatory markers, levels of liver enzymes, as well as ferritin and uric acid were assessed in all subjects. Fatty liver was assessed as presence or absence and grading of hepatic steatosis obtained by ultrasound scan using National Health and Nutrition Examination Survey.

Results. Anthropometric parameters as well as liver enzymes, uric acid and hsCRP were significantly higher in patients with Non-alcoholic fatty liver disease (NAFLD) (BMI 28.05±4.79 vs 34.38±9.73 kg/m², p=0.001; WC 96.15±14.27 vs 108.05 ± 11.47 cm, p=0.001; SBP 122.42±10.62 vs 128.98 ±8.67 mmHg, p=0.01; DBP 78.33±7.57 vs ± 5.94 mmHg, p= 0.001;  hsCRP 1.98± 2.34 vs 4.34±5.56 mg/l, p=0.004; uric acid 296.76±74.06 vs 358.02±83.29 µmol/l, p=0.001; AST 21.70±5.21 vs 23.93±6.91 U/L, p= 0.014; ALT 23.00 ± 11.75 vs 30.50 ±13.70 U/L, p= 0.007). Factor derived from factor analysis that had incorporated waist circumference, hip circumference, body mass index, systolic and diastolic blood pressure, fibrinogen, hsCRP, glucose and uric acid had best discriminatory power followed with fatty liver index score (FLI) and hepatic steatosis index (HSI).

Further trails are needed to adjust existing steatosis risk scores and incorporate other markers of steatosis such as uric acid.

Key words: Non-alcoholic fatty liver disease, fatty liver index score, hepatic steatosis index

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methods (all respiratory tests, the study of the genotype programmed activity of enzymes of detoxification systems, etc.) are technically complex and expensive which limits their clinical application. The commonly used methods for assessing the protein synthetic function of the liver are also insufficiently specific and informative, especially in the case of mild and moderate hepatic impairment. Thus, the overall protein level in chronic hepatitis in mild and moderate levels of activity is not reduced, but may even increase due to enhanced immunoglobulin synthesis; decreased fraction of albumin and characterizes the suppression of protein synthetic function only in significant hepatic involvement, as a rule, in cirrhotic organ transformation [4, 5]. The aim of our research is to develop algorithms to work with patients in order to evaluate the effectiveness of healthy lifestyle in routine practice. Its fragment is the expediency of determining the activity of enzymes arginase and ornithine decarboxylase as biochemical markers of detoxification and protein synthesis of hepatocytes, respectively. Arginase is a key enzyme of the detoxifying function of hepatocytes. Serum ornithine decarboxylase is an inducible enzyme of protein synthesis [4, 5].

Materials and Methods. In order to substantiate the application, we conducted the analysis for determination of markers of arginase and ornithine decarboxylase in patients with signs of hepatitis of mild and moderate degree. 157 patients with verified chronic diffuse liver impairment were diagnosed with chronic or chronic hepatitis of mild or moderate activity (154 males and 3 females) aged 21-64 (average age 45.2 ± 4.5 years). The group of apparently healthy people included 18 subjects (17 men and 1 woman) aged 19-50 years (average age 39.3 ± 3.2 years). In the blood serum of patients, we measured the levels of bilirubin, total protein, proteinogram, alanine aminotransferase activity, aspartate aminotransferase, gamma-glutamyl transpeptidase, thymol test according to generally accepted methods [4]. The level of serum arginase activity was estimated using the modified Chinard ornithine determination method [5, 6]. The level of activity of ornithine decarboxylase – in determining the decrease of the substrate of the enzyme – ornithine in the color reaction with Chinard reagent [5, 7]. The reliability of the differences was determined using Student’s criterion.

Results. All the patients displayed a significant inhibitory effect on the detoxifying function of the liver: the activity of blood arginase is reduced by an average of 1.4 times as compared with apparently healthy subjects (1.33 ± 0.08 mmol / h / l, p <0.001). In all patients, suppression of the protein synthetic function of hepatocytes was observed: a decrease in the activity of blood ornithine decarboxylase (at a rate of 1.95 ± 0.13 nk / l; p <0.001) by 1.5 times, in the absence of significant changes in the content of total protein.

Conclusion. Thus, evaluation of the function of the liver by determining the activity of arginase and ornithine decarboxylase in the blood may be considered as having sufficient clinical information and greater sensitivity than routine biochemical parameters. Prospects for further research. It is advisable to further improve and develop appropriate algorithms for the introduction of healthy lifestyle and their control in patients with chronic NCDs.

Recommendations. It is expedient to actively introduce into the clinical practice the determination of the activity of arginase and ornithine decarboxylase as biomarkers of the detoxification and protein synthetic function of the liver.

References:


Key words: detoxification function, protein synthetic function, chronic non-communicable diseases, healthy lifestyle.

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