

## APPLICATION OF APRI INDEX FOR NON-INVASIVE ASSESSMENT OF THE ACTIVITY OF THE NECROINFLAMMATORY PROCESS IN THE LIVER IN PATIENTS WITH CHRONIC HEPATITIS C

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Chronic hepatitis C (CHC) is a common disease with a high risk of transition to cirrhosis and hepatocellular carcinoma. According to the World Health Organization (WHO), an estimated 325 million people worldwide live with a chronic infection caused by the hepatitis C virus (HCV) [1].

It is now recognized that the decisive factor in the pathogenesis of chronic liver pathologies of various etiologies is the progression of inflammatory and fibrotic processes with the formation of liver cirrhosis. Therefore, an adequate assessment of the state of the hepatobiliary system, including the stage of fibrosis, allows not only to predict the course of HCV, but also to timely prescribe etiotropic and pathogenetic therapy, and to evaluate its effectiveness [2]. Evaluation of the index of histological activity is also important. It allows to judge the possibility of a pro-

gressive course of the disease [3].

A reliable method for evaluating morphological changes in the liver is a puncture biopsy with subsequent histological examination of the tissues. This method is considered the “gold standard” of diagnosis. However, despite numerous advantages, it has a number of significant disadvantages: invasiveness of the procedure, physical and psychological discomfort, the risk of complications, including lethal ones, the existence of limitations and contraindications to this manipulation, the inability to always receive adequate tissue volume, the subjective nature of the evaluation of histological data, high cost, difficulties of dynamic observation, etc. [4]. Therefore, at present, the use of non-invasive methods for the diagnosis of fibrosis is topical – experts called the most widely used and validated tests, which were the APRI and FibroTest index [5]. The bene-

fits of the APRI index are also that it can be used in specific patient categories, such as co-infection with the hepatitis C virus and human immunodeficiency virus, as well as in patients with hemodialysis HCV [6]. Foreign scientists consider it appropriate to use the APRI index to monitor the progression of the disease.

Thus, the search and establishment of a link between laboratory indicators and morphological changes in the liver with HCV, the identification of possible markers that would reflect the state of these changes is relevant.

In connection with this, the goal of our study was to establish in patients with chronic hepatitis C (CHC) the possibility of using the APRI index to determine the activity of the necroinflammatory process in the liver.

**Materials and methods.** 79 CHC patients were under observation. Of these, 44 were women (55.7%), men – 35 (44.3%). The average age of the patients was  $41.16 \pm 2.45$  years. The etiology of the disease was confirmed by the detection of antibodies to HCV in the serum of blood by the method of enzyme immunoassay, RNA-HCV by polymerase chain reaction.

All patients underwent GenoFibroTest, which is an expert system of biochemical blood counts (the content of alpha2-macroglobulin, haptoglobin, apolipoprotein A1, total bilirubin, GGTP (gamma-glutamyltranspeptidase) and ALT-alanine aminotransferase) is determined. It includes 4 modules (FibroTest, detection of viral load, polymorphism of the interleukin-28b receptor gene (IL-28b), genotyp-

ing). Evaluation of the stage of liver fibrosis was determined by the FibroTest system, which is a modern alternative to liver biopsy. To assess the viral necrotic inflammatory activity, AstiTest was used. According to the MEAVIR scale, four stages of activity are distinguished: activity is absent (A0), minimal activity (A1), moderate activity (A2), high activity (A3). The stages of hepatic fibrosis were taken into account: lack of fibrosis (F0), minimal fibrosis (F1), mild fibrosis (F2), severe fibrosis (F3), liver cirrhosis (F4). To calculate the APRI test, platelet counts were taken into account in the clinical analysis of patients' blood and the level of aspartate aminotransferase (AST) in the serum of patients with CHC.

The control group consisted of 30 healthy donors. Statistical processing of the data was carried out using Student's t test, including for small samples, correlation coefficient and least squares method. The APRI test was calculated by the formula  $APRI = \frac{AST \text{ (upper limit of the norm for AST)}}{\text{platelets}} \cdot 10 \cdot 9 / L \times 100$ .

**Results and discussion.** The fibrosis stage F0 was diagnosed in 37 (46.8%), F1 in 9 (11.39%), F2 in 13 (16.45%), F3 in 7 (8.86%), F4 in 13 (16.45%) patients.

Genotypes of HCV 1b occurred in 67 (84.8%), 3a – in 11 (13.9%), 2 – in 1 (1.3%) of the examined patients.

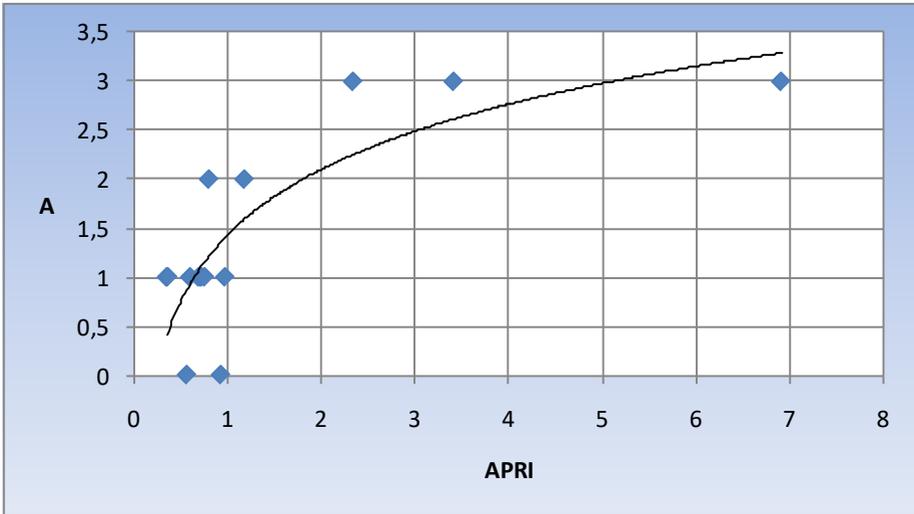
The homozygous genotype of the IL-28 b C / C receptor was detected in 21 (26.5%), T / T in 16 (20.3%), and heterozygous C / T in 42 (53.2%) patients.

Data on the stage of the necroinflammatory process in the liver, taking into

**Table 1.**

Indices of the necroinflammatory process of the liver in patients with CHC.

Indicators	F0 (n=37)	F1 (n=9)	F2 (n=13)	F3 (n=7)	F4 (n=13)
Degree of inflammatory necrotic activity (A)	0- 32.4% 1- 37.8% 2-16.2% 3- 13.6%	0 – 22.3% 1- 33.3% 2- 11.1% 3- 33.3%	0- 7.6% 1-23.1% 2- 23.1% 3- 46.2%	3-100%	3-100%



**Fig.1.** Dependence of A on the level of APRI, where “♦” – measured values; “\_” is an approximating curve.

account the stage of fibrosis are presented in Table. 1.

Studies were conducted on the relationship between A and APRI. The correlation coefficient was  $r = 0.7896$ , that is, a strong direct dependence was revealed. Considering this relationship, it is possible to represent it graphically, using approximating functions constructed using the method of least squares (Fig. 1).

From Fig. 1 shows that if APRI takes a value from the range from 0 to 1, then the activity of the necroinflammatory process in the liver corresponds to A0-A1 (with a probability of 73%), and if the APRI takes a value above 1, then the activity of the

necroinflammatory process in the liver corresponds to A2-A3 (with a probability of 75%).

**Conclusions.** The APRI test can be used as an additional indicator for assessing the stage of the necroinflammatory process in the liver in patients with CHC. The range of values of this indicator from 0 to 1 indicates the absence or minimal activity of the process (A0-A1), above 1 – about moderate (A3) and high (A3) activity of the necroinflammatory process in the liver.

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