Comparison of the two noninvasive methods for assessment of liver fibrosis

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Abstract. Noninvasive liver fibrosis evaluation and monitoring during antiviral treatment would be very useful in clinical practice. For that purpose some easily calculated indices are used. APRI and FIB-4 indices are calculated using AST blood activity and platelets count. According to obtained data both indices are suitable for the evaluation of severe fibrosis in patients with chronic hepatitis C.

Keywords: hepatitis C, fibrosis, non-invasive markers of fibrosis, indices.

Introduction

The aim of this study was to evaluate differences in of basic blood count and routine clinical chemistry tests in chronic hepatitis C patients with mild and advanced fibrosis and validate non-invasive prognostic indices for the assessment of significant fibrosis.

Patients and methods

173 chronic hepatitis C or viral C cirrhosis patients (84 women, 89 men, mean age 39.6±11.7) were enrolled. Basic blood count, clinical chemistry tests and liver biopsy was performed for all patients. Fibrosis was graded using METAVIR scale. According to fibrosis score patients were divided into 2 groups: I – with mild fibrosis (METAVIR 0-I) and II – with advanced fibrosis (METAVIR II-IV).

The APRI (AST-to-platelet-Ratio-Index) was calculated by formula: **(AST/ULN)/platelets x 100**, where AST is asparagine transaminase and ULN is the upper limit of the normal range of this enzyme both expressed in international units/l (IU/L) [1, 2]. The FIB-4 score was calculated using Sterling's formula, as follows: **age [years] × AST [IU/L]/platelet count [expressed as platelets × 109/L] × (ALT1/2[IU/L])** [3, 4].

APRI and FIB-4 indices specificity and sensitivity in diagnosis of advanced fibrosis were evaluated by calculation of area under ROC curves. If the area was >0.7 we considered index suitable for diagnostic use. Differences in the routine blood and biochemical tests results between 2 groups of patients were evaluated using nonparametric Fisher and Chi-square tests, data were considered statistically significant if $p<0.05$.

Results

Statistically significant difference in platelet count, erythrocyte sedimentation rate and liver enzymes activity concentrations was found between 2 groups of patients (Table 1).

The area under ROC curves showed that both indices are suitable for detection of significant fibrosis: APRI – 0.811; FIB-4 – 0.740. The sensitivity and specificity for APRI index was 81.9% and 75% while for FIB-4 – 57.7% and 91,7%, respectively.

Table 1. Blood tests results of patients with different grade of liver fibrosis

Test	I gr.	II gr.	p
Lymphocytes (10^9/l)	7,6±2,3	6,9±1,9	0,64
Erythrocytes (10^{12}/l)	4,7±0,5	4,66±0,45	0,76
Platelets (10^9/l)	242±42	203±65	0,019
Erythrocytes sedimentation rate (mm/h)	6,1±6,0	14,3±12,6	0,046
Bilirubin (μmol/l)	21,1±17,9	13,9±8,9	0,44
Alanine-aminotransferase (IU/l)	64,6±15,5	120,5±69,6	<0,001
Asparagine-aminotransferase (IU/l)	38,3±18,4	74,3±50,8	<0,001
γ-glutamyl-transpeptidase (IU/l)	32,1±26,0	87,3±36,7	<0,001
Alkaline phosphatase (IU/l)	61,2±19,6	69,8±25,7	0,24

Conclusions

Statistically significant differences in basic blood count parameters and clinical chemistry tests were found between patients with mild and advanced fibrosis. APRI index is more reliable predictor of advanced fibrosis in chronic hepatitis C patients than FIB-4.

References

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