



FAN, TA'LIM VA AMALIYOT INTEGRATSIYASI

ISSN: 2181-1776

Zokirov VohidZoyit o'g'li

Bukhara state medical institute

A COMPARATIVE ASSESSMENT OF THE BIOCHEMICAL ANALYSIS OF THE COURSE OF NON-ALCOHOLIC FATTY LIVER DISEASE IN PATIENTS WITH COVID-19

Annotation

This article analyzes a special experiment on the parameters of pigment metabolism, cytolysis and cholestasis to assess the functional state of the liver in non-alcoholic fatty liver disease in middle-aged and elderly patients who underwent COVID-19. The study included a control group of patients who did not have COVID-19, an experimental group of patients diagnosed with COVID-19, a history (periodic abstinence from alcoholic beverages) was collected to rule out alcoholic fatty liver disease and isolated using a special CAGE examination. The conclusion was made on the basis of the PCR test COVID-19.

Keywords: COVID - 19, nonalcoholic fatty liver disease, biochemical analysis, total bilirubin, total cholesterol, atherogenic index.

The urgency of the problem: Non-alcoholic fatty liver disease (NAFLD) is one of the most common forms of damage to the hepatobiliary system in the world in 21st century. According to facts of the literatures spreading of NAFLD is 20-40% [1,4,8,13,17]. NAFLD (fatty dystrophy of the liver, fatty liver fatty infiltration) – is first disease of liver or syndrome, that is formed as a result of accumulation of excess fat in the liver, not less 5-10% from weight of organ, or hepatocytes must has lipids more 5 %. Mostly the NAFLD was detected in the following age groups: 50-59 age (31.1%), 40-49 age (23.6%), 60-69 age (18.1%). The most common risk factors in the population of NAFLD was dyslipidemia (2nd type of Fredriksen) - in 75.9% patients, arterial hypertension -69.9% and hypercholesterolemia – 68.8% [2,7,14,18]. Non-alcoholic fatty liver disease is not related to alcohol consumption, a chronic disease characterized by the accumulation of fat in liver cell

and that plays an important role in diseases of the gastrointestinal tract [3,6,9,11,19]. Thus type of NAFLD may be, as independent disease, combined with obesity, 2nd type of diabetes mellitus and dyslipidemia, and according to a several authors, secondary functional violations of liver, for instance, with dyslipidemia, they can manifest as a NAFLD. In the early stages of the NAFLD are characterized by ineffectiveness of specific treatment and progressive progression of the disease due to the nonspecific clinical signs [5,10,12,15,16]. Taking this into consideration aim of research is to study the comparative description of the development of non-alcoholic fat disease through laboratory - biochemical analysis.

Materials and methods. The study included 94 people who did not have COVID-19, of which 42 (44.7%) were middle-aged 20-59 (average 36.2 ± 3.2) years, 52 (55.3%) were 60-76 (65.2 ± 4.2) elderly patients. Of the 84 patients diagnosed with COVID-19, 34 (40.4%) were middle-aged (38.2 ± 4.4) and 50 (59.5%) were elderly (68.4 ± 2.2). To rule out alcoholic fatty liver disease, a medical history (periodic abstinence from alcoholic beverages) was collected and isolated through a special CAGE survey. Were diagnosed on the basis of COVID-19 PCR test. Criteria for inclusion in the study: patients aged 20-75 years with hepatic steatosis (HS) and steatohepatitis (SH); Persons who have given written consent to laboratory and biochemical tests. Exclusion criteria: alcohol or drug dependence, toxic, viral, autoimmune liver damage, patients with oncological diseases, severe diseases (uncontrolled arterial hypertension, diabetes mellitus type 2 decompensation stage, chronic heart failure functional class III-IV, myocardial infarction and stroke patients), pregnant, breastfeeding women. During the study, the practice was compared with 18 healthy individuals (ages 20–65). The data obtained were statistically processed using the Student's t-criterion, and the difference in results with $P < 0.05$ was recognized as reliable.

During the diagnosis, anamnestic data were collected from patients, laboratory and instrumental examinations (ultrasound, fibroelastometry - "Fibroscan" Echosens, Paris) were used. COVID - The development of liver nonalcoholic fatty disease in 19 middle-aged and elderly patients with ultrasound examination of the hepatobiliary system was performed in 600 patients with risk factors for NAFLD: obesity, dyslipidemia, impaired carbohydrate resistance. As a result of liver ultrasound examination, 178 patients with NAFLD were isolated.

Results and analysis: Parameters of pigment metabolism, cytolysis, and cholestasis were studied to assess the functional status of the liver in non-alcoholic fatty liver disease in middle-aged and elderly patients who have had COVID-19. Biochemical tests: alanine aminotransferase (ALT) and aspartate aminotransferase (AsT), g-glutamyltranspeptidase (GGTP), alkaline phosphatase (AP), total bilirubin and its fractions were analyzed. From our study analysis, the indicators of pigment metabolism, cytolysis and cholestasis were highly expressed in our elderly patients who have had COVID-19 (Table 1).

Table №1. Biochemical and hematological characteristics of group of patients

№	Parameter	Control group	who had not COVID – 19 n =94		who had COVID – 19 n =84	
		n=18	Middle-aged n=42	Elderlyn=52	Middle aged n =34	Elderly n =50
1	Protein	65,22±0,12	72,2±2,2	74,2±2,6	76,2±2,2	80,2±2,8

	(g/l)					
2	Albuming/l	52.3±0.2	50,1±1,1	48,7±2,2	48,3±2,3	45,3±3,2
3	Total bilirubin mkmol/l	9,01±2.45	15,3±5,7	17,4±4,6	20,3±3,1	24,7±5,9*
4	Conjugated bilirubin mkmol/l	2,27±0,43	4,1±0,6	5,2±0,7	7,6±0,8	10,8±0,9*
5	ALT(IU/l)	30±0,52	41,5±4,74	48,3±8,28	57,4±8,4	78,1±5,2
6	AST(IU/l)	34±0,27	40,8±4,68	49,2±4,93	55,1±3,7	67,7±4,5
7	AP (IU/l)	130±2,27	160,2±2,48	171,8±4,8	190,4±6,3	220,9±10,5
8	γ-GTP(IU/l)	41±0,87	46,3±0,88	52,7±1,82	67,3±2,21	73,3±2,2
9	Glucose (mmol/l)	4,2±0,7	4,8±0,5	5,5±0,8	5,2±1,6	7,1±1,8

Disclaimer: * p<0,05; Reliable differences for control group results.

Significant reductions in albumin levels relative to those in the control group, especially in elderly patients undergoing COVID-19, with significant liver function impairment can be seen from 45.3 ± 3.2 with decreased albumin levels. The cytolysis rate in patients who did not undergo COVID-19 was 41.5 ± 4.74 in ALT middle-aged patients, 48.3 ± 8.28 in elderly patients, and 57.4 ± 8.4 in patients with COVID-19. In patients of this age, this indicator was found to be ALT 78.1 ± 5.2 2-3 times higher and AST 67.7 ± 4.5 higher than in healthy and COVID-19 patients. The total bilirubin level was also 15.3 ± 5.71 in middle-aged patients who did not undergo COVID-19, and 20.3 ± 3.1 in patients who underwent COVID-19, and the total bilirubin in elderly patients who did not undergo COVID-19 was 17.4 ± 4 . , 6 patients with COVID-19 had a significant increase of 24.7 ± 5.9 . From the results of the analysis, it can be seen that in the elderly patients who underwent COVID-19, there was a marked increase in inflammation in the liver.

Alkaline phosphatase was also found to be 1.6 times higher in patients who underwent COVID-19. Carbohydrate metabolism indicators also showed a significant increase in glucose levels ($p > 0.05$) because carbohydrate resistance was impaired among 15 patients in the control group.

Thus, based on the studies, it can be concluded that in patients with non-alcoholic fatty liver disease who underwent COVID-19, the amount of albumin decreased, the amount of liver cytolysis enzymes ALT, AST increased significantly. No significant changes were observed in patients who did not undergo COVID-19, but an increase in blood sugar was observed in patients with non-alcoholic fatty liver disease who underwent COVID-19.

Conclusion: Non-alcoholic fatty liver disease (NCD) is an important disease of the gastrointestinal tract. Elevated biochemical parameters are observed in patients with COVID-19, confirmed by severe liver damage. In our study, laboratory analyzes and comparative analysis of 178 COVID-19 middle-aged and elderly patients were performed.

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