

Determination and Analysis of Changes in the Hepatobiliary System in Patients with COVID-19

Sobirova G. H.^{1,*}, Bafoyeva Z. O.²

¹Head of Balneology Department, Republican Scientific-Practical Medical Center of Specialized Therapy and Medical Rehabilitation, Uzbekistan

²Department of Rehabilitation, Folk Medicine and Physical Education, Tashkent Medical Academy, Tashkent, Uzbekistan

Abstract We retrospectively examined the medical history of 685 patients (25-90 years old) hospitalized with a diagnosis of coronavirus in the 2nd clinic of the Tashkent Medical Academy. Data obtained (age, sex, comorbidities, days of hospital treatment, laboratory parameters), mainly patients with changes in the hepatobiliary system (those with increased levels of alanine transferase and aspartate aminotransferase enzymes) were selected and statistically analyzed. Our statistical analysis revealed an increase in alanine transferase and aspartate aminotransferase enzymes in 182 patients, mainly men, middle-aged (44-60 years), and those with severe disease.

Keywords COVID-19, Liver, ALT, AST

1. Introduction

The new coronavirus (COVID-19) disease of 2019 has affected nearly 100 million people to date, with nearly 2 million people becoming victims of the disease. [1]. SARS-CoV-2 is an etiological agent that causes pneumonia, cough, episodic diarrhea, headache, heart damage, and liver changes in some patients, a condition that is more common in patients with caries and concomitant diseases.

Patients with liver dysfunction were also more common among patients admitted to the hospital with Covid-19. Elevations in alanine aminotransferase (ALT) and aspartate aminotransferase (AST) occurred in 16-53% of patients. [2]. Covid-19 in severe cases liver dysfunction became more severe. In China, when patients were hospitalized, an increase in AST / ALT was found in 18.2 / 19.8% of mild patients and 39.4 / 28.1% of severe patients. [3]. Another small number of patient observations in China showed that AST increased by 62% in those in need of intensive care and by 25% in those who did not. [4]. In subclinical patients, AST and ALT were increased in 8.7 and 8.9% of patients, respectively [5]. In 5,700 patients in New York, 58.4% had an AST > 40 U/L and 39% had an ALT > 60 U/L. [6]. In this cohort, 56 patients (2.1%) developed acute liver failure, with AST and ALT > 15 times higher than the upper limit of normal. Of these 56 patients, 3 were 18–65 years of age (3/1373, 0.2%) and recovered from the hospital, and 53 died.

25 were aged 18–65 years (25/134, 18.7%) and 28 were > 65 years of age (28/469, 6.7%). [6]. Therefore, the frequency of liver damage depends on the severity of the disease.

Liver damage in patients with coronavirus infection may be directly related to viral infection of liver cells, as pathological studies in patients with ARVI have confirmed the presence of the virus in liver tissue. Angiotensin-synthesizing enzyme 2 (ACE2) is also represented by unwanted cellular receptors for SARS-Cov-2, liver and bile duct cells [7]. Because its expression is significantly higher in bile duct cells, liver injury to Covid-19 appears to be more related to liver cell damage. [7]. However, this has not yet been confirmed in patients with Covid-19 [6]. Elevation ALT / AST levels may cause hepatotoxic effects of the drug, hypoxia associated with cytokine storms, and / or pneumonia [2], [7].

To what extent Covid-19 is involved in liver damage, the processes that take place in it have not yet been well studied and still require a lot of research.

2. Materials and Methods

We retrospectively examined the medical histories of 685 (25-90 years old) patients were treated with coronavirus from July 19 to August 16, 2020 at TTA 2 Clinic according to (sex, age, diagnosis, and etc.), we selected patients with changes in the hepatobiliary system and conducted a statistical analysis.

3. Results

The results showed that a total of 685 patients were

* Corresponding author:
guzals@mail.ru (Sobirova G. H.)

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hospitalized. Of these, 54% (371) were women and 46% (314) were men. 84% (575) were cured and discharged from the hospital, 16% (110) were seriously ill. Patients were hospitalized for an average of 10 days. 99% of patients were from Tashkent.

All patients were suspected of coronavirus, 2-3% confirmed Covid-19, 2-3% were diagnosed with respiratory disease, and the remaining patients were diagnosed with bilateral coronavirus. 88.5% of patients (606) complained mainly of sore throat, cough, wheezing, shortness of breath, and pain under the ribs.

In the table below, we can see the percentage distribution of patients by age, and the majority (31%) are middle-aged. (Figure 1)

In terms of age, 25 (under 25 years old), 164 young people (25-43 years old), 210 middle-aged people (44-60 years old),

162 elderly people (61-75 years old), 124 elderly people (76-90 years old).

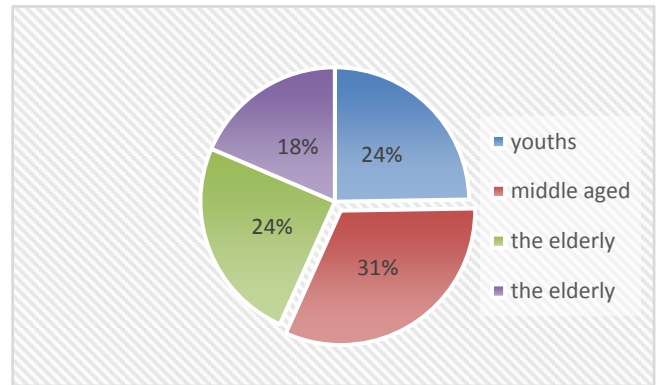


Figure 1. Distribution of total patients by percentage

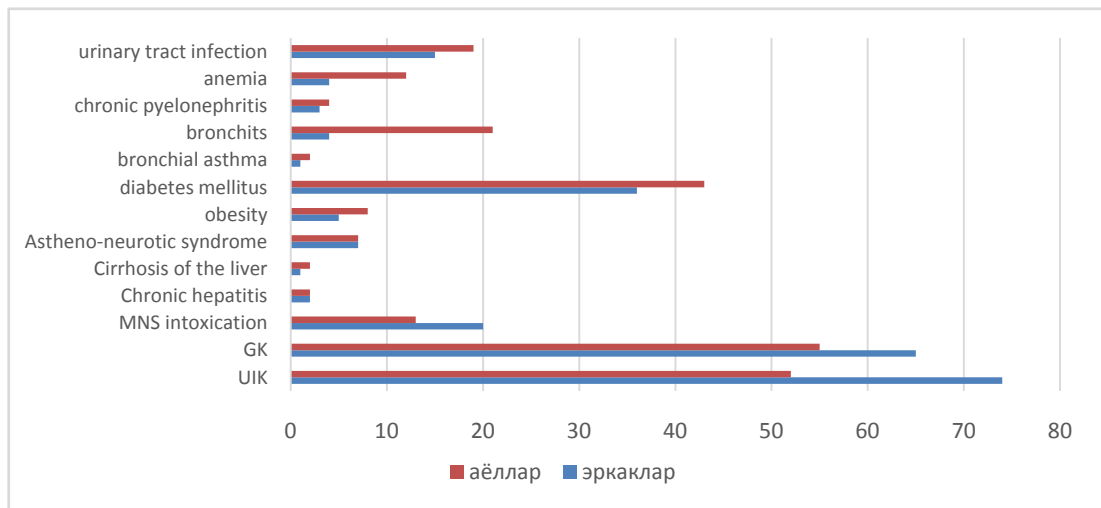


Figure 2. Incidence rates of co-morbidities among total patients

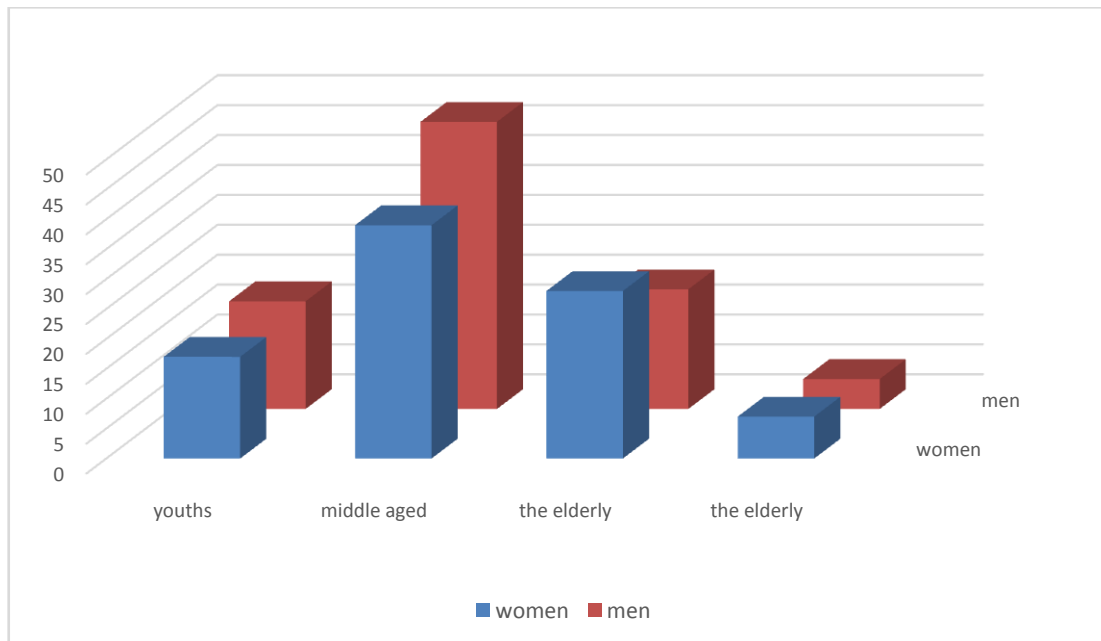


Figure 3. Distribution of ALT and AST increases by age and sex

In terms of co-morbidities: Diabetes mellitus 11% (76 cases), coronary heart disease 18% (126 cases), Hypertension 18% (121 cases), urinary tract infections 3.6% (25 cases), MNS intoxication 4.8% (33 cases), Asthenoneurotic syndrome 2% (14 cases), Anemia 2% (15 cases), Obesity 1.8% (12 cases), Bronchitis 2.5% (17 cases), Bronchial asthma 0.4% (3 cases), Chronic obstructive pulmonary disease 1.2% (8 cases), liver cirrhosis 0.9% (6 cases), pyelonephritis 0.9% (6 cases) (shown in Figure 2).

Among 685 patients, 11.5% (79) had digestive complaints. Liver enzymes increased by 26.5% (182).

These enzymes were found to be elevated in all of the dead and critically ill. Of the 182 patients, 2 were diagnosed with liver cirrhosis and 8 with hepatitis of various etiologies.

We had 182 patients, mostly middle-aged and men. Taking into account the data obtained, AST (25 patients) showed the highest increase among patients.

As liver enzymes were increased in more middle-aged people, we analyzed them in more depth and identified the following. In middle-aged people, an increase in ALT ≥ 10 mmol/l decreased in 18 women and 23 men. ALT increased by more than 10 mmol/l in 16 women and 9 men. Similarly, changes in aspartate aminotransferase with an increase in AST ≥ 10 mmol/l occurred in 24 women and 22 men. Less than AST ≤ 10 mmol/l was observed in 7 women and 18 men. (Figure 3)

4. Discussion

Comparing the data obtained with the results of foreign countries: changes in foreign countries have been found to increase AST more than ALT, mainly in the elderly, men, the severity of the disease, and a large proportion of deaths occurred in these patients.

In our TTA 2 clinic, changes in the hepatobiliary system were observed, mainly in middle-aged men, with a greater increase in AST than in ALT. The severity of the disease and the mortality rate were also recorded among us among these 182 patients.

5. Conclusions

1. In the TTA clinic, enzymes were increased in 26.6% of 685 patients.

2. Of the 685 patients, 11.5% had complaints of digestive problems.
3. The disease and changes in the hepatobiliary system were more common in middle-aged (44-60 years) men.
4. Basically, more changes were found in AST than in ALT.
5. Mortality and severity of the disease were higher among 182 patients.

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