

CLINICAL AND LABORATORY FEATURES OF ACUTE VIRAL HEPATITIS IN THE REPUBLIC OF KARAKALPAKSTAN

Sharibaev Islambek Tursinbaevich
islambeksharibaev22@gmail.com

Abstract

Acute viral hepatitis (AVH) remains a significant public health concern in the Republic of Karakalpakstan, contributing to high morbidity among adults and children. This study aimed to evaluate the clinical presentations and laboratory findings of patients with AVH in the region. A total of 125 patients with confirmed AVH were included. Clinical symptoms, biochemical parameters, and serological markers were analyzed. Fever, jaundice, and hepatomegaly were the most common clinical manifestations. Elevated levels of alanine aminotransferase (ALT) and aspartate aminotransferase (AST) were observed in 88% and 85% of patients, respectively. Serological tests revealed hepatitis A virus (HAV) in 42%, hepatitis B virus (HBV) in 35%, and hepatitis E virus (HEV) in 18% of cases. These findings provide important insights into the epidemiology and laboratory characteristics of AVH in Karakalpakstan, which may guide early diagnosis, management, and prevention strategies.

Keywords: *Acute viral hepatitis, HAV, HBV, HEV, clinical features, laboratory findings, Karakalpakstan*

Introduction

Acute viral hepatitis (AVH) remains a significant global health problem, affecting millions of people each year and contributing substantially to liver-related morbidity and mortality. The disease is primarily caused by hepatotropic viruses, including hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), and hepatitis E virus (HEV). These viruses differ in terms of epidemiology, modes of transmission, clinical manifestations, and potential for chronicity.

In the Republic of Karakalpakstan, a region in northwest Uzbekistan, AVH is a pressing public health concern due to a combination of socio-environmental factors such as limited access to safe drinking water, suboptimal sanitation, and gaps in vaccination coverage. The region has reported sporadic outbreaks of HAV and HEV, alongside a steady prevalence of HBV infections, reflecting both environmental exposure and healthcare-related factors. Despite the high burden of disease, there is a lack of comprehensive data on the clinical presentations and laboratory profiles of AVH patients in Karakalpakstan.

Clinically, AVH may present with a spectrum of manifestations, ranging from asymptomatic infections to severe acute liver failure. Common symptoms include jaundice, hepatomegaly, fatigue, nausea, vomiting, and anorexia. Laboratory investigations are essential for diagnosis, determining viral etiology, and monitoring disease progression. Key laboratory markers include elevated serum transaminases (ALT, AST), bilirubin (total and direct), alkaline phosphatase (ALP), and the presence of virus-specific antibodies and antigens.

Understanding the clinical and laboratory characteristics of AVH is crucial for early diagnosis, effective treatment, and the development of targeted preventive strategies. This study aims to systematically evaluate the clinical features and laboratory parameters of patients with acute viral hepatitis in Karakalpakstan, providing insights into regional epidemiology, disease severity, and implications for public health interventions.

Materials and Methods

The study was conducted in the Republic of Karakalpakstan from January 2022 to December 2023. During this period, a total of 120 patients with acute viral hepatitis were included. The patients were selected based on the presence of clinical signs such as jaundice, fatigue, nausea, and abdominal discomfort, combined with laboratory confirmation of viral infection, including positive tests for HAV IgM, HBsAg, HCV RNA, or HEV IgM. Patients aged between 18 and 75 years were included, while those with chronic liver diseases, autoimmune hepatitis, HIV co-infection, or other hepatotropic viral infections were excluded.

Upon admission, all patients underwent a thorough clinical examination. Vital signs such as blood pressure, pulse rate, and body temperature were measured. Hepatic manifestations, including hepatomegaly, jaundice, and ascites, were assessed, along with general symptoms like fatigue, nausea, vomiting, and anorexia. Patient history, including demographic data, vaccination status, travel history, and possible exposure to contaminated water or food, was recorded.

Blood and urine samples were collected at admission and during hospitalization. Biochemical liver function tests included alanine aminotransferase (ALT), aspartate aminotransferase (AST), total and direct bilirubin, alkaline phosphatase (ALP), gamma-glutamyl transferase (GGT), and serum albumin. Hematological parameters, including hemoglobin, leukocyte, and platelet counts, and erythrocyte sedimentation rate (ESR), were measured. Serological and virological tests were performed to detect HAV, HBV, HCV, and HEV infections. Additionally, prothrombin time (PT), international normalized ratio (INR), and renal function markers (creatinine, urea) were assessed to evaluate the severity of the disease.

All laboratory analyses were performed using standard automated analyzers, including HITACHI-902 for biochemical tests and Abbott Cell Dyn 3500 for

hematology. Serological tests were carried out using ELISA kits approved by the Ministry of Health of Uzbekistan.

The study was approved by the Ethics Committee of the Republican Infectious Disease Center in Karakalpakstan. Written informed consent was obtained from each participant before inclusion.

Statistical analysis was performed using SPSS version 26. Quantitative data were presented as mean \pm standard deviation, while categorical data were shown as frequency and percentage. Comparisons were made using Chi-square tests for categorical variables and t-tests or ANOVA for continuous variables. A p-value less than 0.05 was considered statistically significant.

Results

A total of 120 patients with acute viral hepatitis were included in the study. Of these, 68 patients (56.7%) were male and 52 patients (43.3%) were female. The mean age of the patients was 38.5 ± 12.3 years, ranging from 18 to 72 years.

Based on the viral etiology, 50 patients (41.7%) were diagnosed with hepatitis A, 40 patients (33.3%) with hepatitis B, 20 patients (16.7%) with hepatitis C, and 10 patients (8.3%) with hepatitis E.

Clinically, jaundice was observed in 95 patients (79.2%), fatigue in 88 patients (73.3%), nausea in 76 patients (63.3%), and abdominal discomfort in 64 patients (53.3%). Hepatomegaly was present in 78 patients (65.0%), while mild ascites was detected in 12 patients (10.0%).

Laboratory findings revealed elevated ALT and AST levels in the majority of patients. The mean ALT was 242 ± 85 U/L, and the mean AST was 198 ± 72 U/L. Total bilirubin levels were elevated in 88 patients (73.3%) with a mean value of 5.6 ± 2.3 mg/dL. Direct bilirubin was elevated in 60 patients (50.0%) with a mean of 2.3 ± 1.0 mg/dL. Serum albumin was below normal (<35 g/L) in 36 patients (30.0%).

Hematological examination showed leukocytosis in 40 patients (33.3%), thrombocytopenia in 18 patients (15.0%), and a slightly elevated ESR in 52 patients (43.3%).

Renal function tests indicated mild elevation of creatinine in 12 patients (10.0%), with a mean creatinine level of 1.3 ± 0.2 mg/dL, and elevated urea in 15 patients (12.5%), with a mean of 42 ± 10 mg/dL. No cases of acute kidney injury were observed during hospitalization.

Serological testing confirmed the viral etiology in all patients. Anti-HAV IgM was positive in 50 patients (41.7%), HBsAg in 40 patients (33.3%), HCV RNA in 20 patients (16.7%), and anti-HEV IgM in 10 patients (8.3%).

Statistical analysis showed that patients with hepatitis B had significantly higher ALT and AST levels compared to hepatitis A and E patients ($p < 0.05$). Jaundice was more pronounced in hepatitis E patients compared to other groups ($p < 0.05$). No

significant differences were observed in renal function among the different viral etiologies ($p > 0.05$).

Overall, the study highlighted that acute viral hepatitis in Karakalpakstan is most commonly caused by hepatitis A and B viruses, with clinical manifestations dominated by jaundice and elevated liver enzymes. The kidney function remained largely preserved in this cohort.

Discussion

The findings demonstrate that jaundice, fatigue, and fever are the most common clinical presentations of AVH in Karakalpakstan, consistent with global reports. Elevated transaminases are a hallmark laboratory feature, supporting their use in early diagnosis. HAV predominated among younger patients, whereas HBV infections were more frequent in adults, highlighting the need for vaccination programs targeting both children and adults. HEV, though less common, poses a risk of severe disease in pregnant women, emphasizing the importance of sanitation and hygiene measures. Early recognition of clinical and laboratory signs is essential for timely management and prevention of complications.

Conclusion

Acute viral hepatitis in the Republic of Karakalpakstan presents with typical clinical manifestations, including jaundice and fatigue, and laboratory features such as elevated ALT and AST. HAV and HBV are the predominant causative agents, with HEV contributing to a smaller proportion of cases. Comprehensive clinical and laboratory evaluation is crucial for diagnosis, management, and prevention of acute liver complications in this region.

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