

ORIGINAL ARTICLE

Frequency of Hepatitis a Virus as a Cause of Anicteric Hepatitis in Children Under 5 YearsIRFAN KHAN¹, IRFAN ULLAH², SAEEDULLAH³, ZAHID IRFAN MARWAT⁴, ARSHAD KHAN⁵, HAMAYUN ANWAR⁶¹Associate Professor, Department of Pediatrics Nowshera Medical College Nowshera²Assistant Professor Pediatric Medicine Nowshera Medical College, Nowshera³District Specialist Peads, DHQ Hospital Dir Upper⁴Professor, Department of Biochemistry Nowshera Medical College Nowshera⁵Assistant Professor Pediatrics Medicine, Qazi Hussain Ahmad Medical Complex Nowshera⁶Assistant Professor Pediatrics, Nowshera Medical College, NowsheraCorresponding author: Irfan Ullah, Email: dr.irfanullah75@yahoo.com**ABSTRACT**

Background and Aim: Globally, Acute viral hepatitis A is the widespread type of hepatitis particularly in developing countries. Children under 5 year of age are at greater risk of asymptomatic infections, and if they do develop symptoms, they are likely to experience anicteric illnesses. The present study aimed to determine the incidence of hepatitis A virus as anicteric hepatitis cause among children under 5 years.

Methodology: A cross-sectional study was carried out on 380 children (<5 years) in the Pediatric Medicine Department of Qazi Hussain Ahmad Medical Complex Nowshera for the duration from 1st July 2021 to 30th June 2022. Study protocol was approved by the institute ethical committee. Children with normal-colored urine, diarrhea, abdominal pain, vomiting, malaise, nausea, and low-grade fever (< 38.5 °C) were investigated. Demographic details and physical examination were recorded from children with elevated transaminase levels (ALT). Children with elevated transaminases were only enrolled and categorized into two groups: Group-I HAV-positive and Group-II HAV negative groups. Children with transaminases were the only ones who had IgM antibodies against HAV virus. ELISA was used to test for anti-HAV IgM.

Results: Of the total 380 children, the incidence of elevated transaminases (ALT, AST) were 42.6% (n=162). The frequency of HAV positive and HAV negative was 13.6% (n=22) and 86.4% (n=140) respectively. Out of 162 children, there 84 (51.9%) male and 78 (48.1%) females. Age-wise distribution of patients were as follows: Age≥3 years 92 (56.8%) and age≤ 70 (43.2%). HAV infection rates were significantly higher among children over 2 years old (p <0.05). Abdominal pain, vomiting, diarrhea, nausea, Right hypochondrial tenderness, Arthralgia, and Hepatomegaly were different clinical manifestation of HAV negative and HAV positive found in 20.7% (n=29) versus 13.6% (n=3), 97.1% (n=136) versus 81.8% (n=18), 87.1% (n=122) vs 81.8% (n=18), 81.4% (n=114) versus 95.5% (n=21), 32.9% (n=46) versus 86.4% (n=19), 38.6% (n=54) versus 59.1% (n=13), 4.3% (n=6) versus 18.2% (n=4) respectively.

Conclusion: Children with anicteric hepatitis under the age of 5 years were found to have 13.6% HAV infection. Diarrhea and vomiting were the most prevalent clinical manifestation of children < 5 years. A higher level of maternal education, older age, and poor sanitary conditions were various risk factors related to HAV infection.

Keywords: Hepatitis A, Anicteric hepatitis, Children

INTRODUCTION

Globally, hepatitis A is a major public health concern due to its acute, self-limiting nature [1]. Geographic, environmental, and socioeconomic factors affect the seroprevalence of the hepatitis A virus (HAV) [2]. Seroprevalence investigations in different age groups facilitate our comprehension of hepatitis A infection and response to hepatitis A vaccine. Hepatitis A virus (HAV), an RNA virus with no sheath, is especially resistant and infectious [3]. The virus is distributed mostly by fecal-oral transmission and is a global public health issue [4]. Fulminant hepatitis (FH), or abrupt liver failure with encephalopathy, is the most common consequence of HAV infection, occurring in < 1% of cases [5]. In most cases, hepatitis A virus is regarded a moderate or even non-existent condition in children [6]. Hepatitis A is caused by the hepatitis A virus and is mostly spread by the fecal-oral route [7]. Transmission of Hepatitis A is strongly linked to low socioeconomic position and inadequate hygienic conditions [8]. The average age of hepatitis A virus infection in developing and developed nations has been demonstrated to differ, with infections occurring in younger age groups in poorer countries [9]. Due to the disease is underreported and infections frequently go unrecognized, assessing humoral antibodies is the best way to identify the epidemiology. The level of anti-HAV IgG demonstrates the overall infection rate, both current and previous [10, 11].

Asymptomatic infections were found in majority (70%) of children under five years age, and when they do happen, they are frequently anicteric. As a result, the illness has been under-declaration [12, 13]. Anicteric hepatitis is a minor type of hepatitis that does not cause jaundice. Anorexia, Gastrointestinal disturbances, and a mild fever are among the symptoms. ALT and AST serum levels were significantly higher in children [14]. Diagnose is completed substantially less regularly, which

contributes to propagation of disease [15]. The infection frequently remains undiagnosed due to the icterus absence and unclear symptoms. The purpose of the present investigations was to assess the prevalence of HAV in children under five year age.

METHODOLOGY

A cross-sectional study was carried out on 380 children (<5 years) in the Pediatric Medicine of Qazi Hussain Ahmad Medical Complex Nowshera during the period from 1st July 2021 to 30th June 2022. Study protocol was approved by the institute ethical committee. Children with normal-colored urine, diarrhea, abdominal pain, vomiting, malaise, nausea, and low-grade fever (< 38.5 °C) were investigated. Demographic details and physical examination were recorded from children with elevated transaminase levels (ALT). Children with elevated transaminases were only enrolled and categorized into two groups: Group-I HAV-positive and Group-II HAV negative groups. Children with transaminases were the only ones who had IgM antibodies against HAV virus. ELISA was used to test for anti-HAV IgM. Children with chronic liver disease, jaundice, suspected bacterial, prior history of HAV infection, severe dehydration, frequent motion, diarrhea, and high-grade fever were excluded. Laboratory tests such as complete blood count, abdominal examination, growth parameters, and general examination were done.

SPSS version 27 was used for data analysis. Quantitative variables were expressed as mean and standard deviation. Qualitative variables were described as frequencies and percentages. The independent sample t-test was used to compare two independent groups with quantitative data and a parametric distribution, whereas the Mann-Whitney test was used to compare nonparametric data. The confidence interval was set at 95%, while the acceptable margin of error was set to 5%. As a result, the p-

value was deemed significant as follows: p 0.05 = significant, p 0.01 = extremely significant.

RESULTS

Of the total 380 children, the incidence of elevated transaminases (ALT, AST) were 42.6% (n=162). The frequency of HAV positive and HAV negative was 13.6% (n=22) and 86.4% (n=140) respectively. Out of 162 children, there 84 (51.9%) male and 78 (48.1%) females. Age-wise distribution of patients were as follows: Age ≥3 years 92 (56.8%) and age<3 years 70 (43.2%). HAV infection rates were significantly higher among children over 2 years old (p <0.05). Abdominal pain, vomiting, diarrhea, nausea, Right hypochondrial tenderness, Arthralgia, and Hepatomegaly were different clinical manifestation of HAV negative and HAV positive found in 20.7% (n=29) versus 13.6% (n=3), 97.1% (n=136) versus 81.8% (n=18), 87.1% (n=122) vs 81.8% (n=18), 81.4% (n=114) versus 95.5% (n=21), 32.9% (n=46) versus 86.4% (n=19), 38.6% (n=54) versus 59.1% (n=13), and 4.3% (n=6) versus 18.2% (n=4) respectively. Frequency of HAV positive and negative are illustrated in Figure-1. HAV negative and HAV positive groups' demographic features were compared as shown in Table-I. Gender's distribution are shown in Figure-2. Clinical manifestation of both groups are compared in depicted in Figure-3. HAV negative and HAV positive groups' liver enzymes are shown in Table-II.

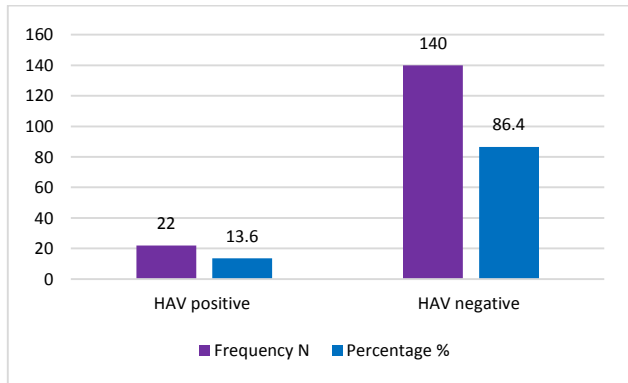


Figure-1: frequency of HAV positive and negative (n=162)

Table-1: demographic details of both groups

Variables	HAV positive (N=22)	HAV negative (N=140)	P-value
Age (years)			
≥3	34.52 ± 16.63 15 (68.2)	26.28 ± 16.39 60 (42.9)	0.03
<3	7 (31.8)	80 (57.1)	
Gender			
Male	10 (45.5)	74 (52.9)	0.316
Females	12 (54.5)	66 (47.1)	
Weight (Kg)	14.27 ± 4.36	12.31 ± 3.82	0.013
BMI (Kg/m ²)	15.68 ± 3.49	14.79 ± 4.31	0.136

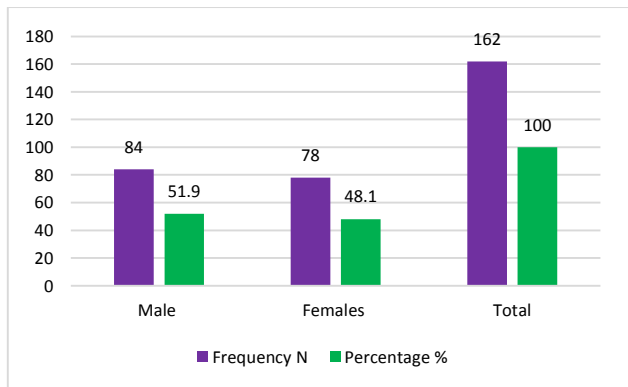


Figure-2: Gender's distribution (n=162)

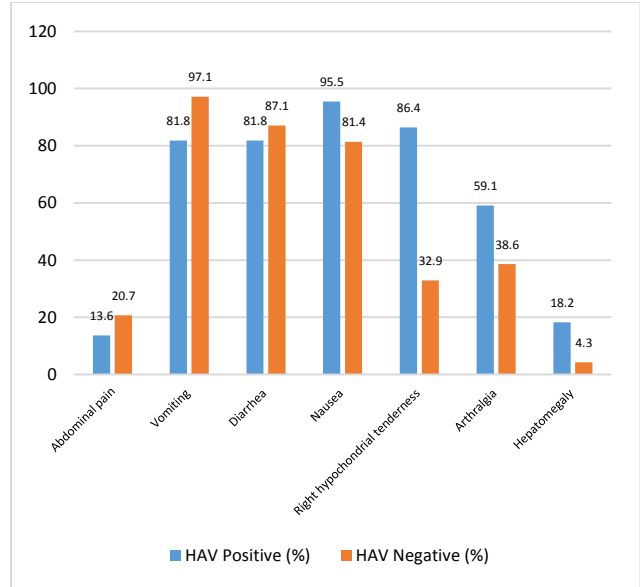


Figure-3: Comparison of clinical manifestation in both groups

Table-2: comparison of HAV negative and positive groups' liver enzymes

Variables	HAV positive (N=22)	HAV negative (N=140)	P-value
AST (IU/L)	948 (618.6–1032.8)	142 (112.6–202)	0.000
ALT (IU/L)	819 (656.8–972)	120.7 (85–167)	0.000

DISCUSSION

The present study mainly focused on the incidence of hepatitis A as anicteric hepatitis source among children under five years age and found that infectious HAV is frequent in Pakistani children. Special vaccination could be used for prevention of HAV associated diseases. HAV infection was identified in 13.6% of children with anicteric hepatitis under the age of five. Diarrhea and vomiting were the most common clinical manifestations in children under the age of five. HAV infection was connected with greater levels of mother and paternal education, poor hygienic conditions, and being older. In a recent investigation, 97% children had 13.6% children had positive acute HAV infection and was deemed the most likely cause of symptomatic acute hepatitis [16].

The research by Benzamin et al. [17] comprised 161 children (5 months to 16 years) who were hospitalized for acute hepatitis. Salmonella hepatitis was the prevalent cause of anicteric hepatitis (66.7%), followed by HAV (16.7%). Three (23%) patients died in the acute liver failure group, all from HAV. In Talat et al.'s investigation, the most common cause of fulminant hepatic failure was HAV [18].

Hepatitis A vaccine effectively disrupts viral transmission and outcome in a significant reduction in the overall rate of hepatitis A infection. Although baby immunization would be an ideal preventative method, most women of reproductive age have anti-HAV antibodies, which is passed to their babies during pregnancy in medium or high endemicity areas [19]. Koroglu et al. [20] discovered that HAV seroprevalence was 70.2% in newborns under one year old and 73.2% in women under 30. They concluded that maternal antibodies are transmitted at a high rate. In newborns and young children, the presence of maternal anti-HAV antibodies interferes with the immunological response to hepatitis A vaccine [21, 22].

Also, greater bilirubin levels were statistically significant in patients who died from fulminant HAV, which agrees with Wange et al., [23] who discovered that higher mortality of children was due to hepatic failure fulminant caused by indirect and total bilirubin levels. Prothrombin time greater than 27 seconds was linked to a higher likelihood of fulminant hepatic failure developing in acute

HAV children, and associated with decreased ALT and AST causing higher mortality rate [24, 25].

Of the several demographic parameters studied, age had a significant impact on the prevalence of anti-HAV IgM [26, 27]. Seropositivity increases in small increments with age. Youngsters older than two years old were much more infected. Older children are less reliant, and they engage in more outside play, which exposes to disease danger. They may be infected with HAV without recognizing it, facilitating the stealthy spread of illness. All of the youngsters had fever (100%). Gossner et al. [28] did research on children with acute viral hepatitis A. As part of the inclusion criteria, all patients had jaundice. Fever, hepatomegaly were the most prevalent clinical manifestation. Because of the risk of fulminant hepatic failure in anicteric children, our research proposes that HAV vaccination be made mandatory. The lack of jaundice in young children may delay the identification of HAV infection.

CONCLUSION

Children with anicteric hepatitis under the age of 5 years were found to have 13.6% HAV infection. Diarrhea and vomiting were the most prevalent clinical manifestation of children < 5 years. A higher level of maternal education, older age, and poor sanitary conditions were various risk factors related to HAV infection.

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