

Spectrum of Viral Hepatitis in Patients Attending Super Speciality Hospital from North India

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Abstract

Background: Viral hepatitis in acute and chronic form remains a major cause of morbidity and mortality in India. Exposure to Hepatitis A Virus (HAV), Hepatitis E virus (HEV), Hepatitis B Virus (HBV) and Hepatitis C Virus infection vary in different parts of country with different socioeconomic groups. The prevalence of HAV, HEV, HBV, and HCV infection among children up to 12 years, adolescents between 13 yrs. to 18 yrs. and adults from this region attending hospital is not known.

Methods: 2892 patients (2011 Male, 881 Female) of acute and chronic liver disease with suspected viral etiology and admitted between January 2012 to July 2014 were included in the study. Clinical features of patients, routine diagnostic investigations including abdominal ultrasound were recorded. Two ml. of blood was collected, serum separated and stored at -20°C. These serum samples were tested for anti HAV IgM, anti HEV IgM, HBsAg and anti HCV by ELISA.

Results: Overall 120 children (75 Male, 45 Female) of acute hepatitis and acute on chronic hepatitis were reactive for anti HAV IgM (120/2892, 4.15%) and 05 children were reactive for anti HEV IgM (0.17%). 16 children (13 Male, 03 Female) of chronic liver disease were HBsAg (0.55%) reactive and 07 children had HCV (0.24%) infection. Among adolescents 09 patients were reactive for anti HAV IgM (0.31%) and 04 adolescents had HEV (0.14%) infection. 05 adolescents were HBsAg (0.17%) reactive and 04 were having HCV (0.14%) infection. Among adult, 70 patients (58 Male, 12 Female) were reactive for anti HAV IgM (2.42%), 14 patients reactive for anti HEV IgM (0.48%). 92 adult patients (73 Male, 19 Female) were HBsAg (3.18%) reactive. 102 patients (82 Male, 20 Female) of chronic liver disease were reactive for anti HCV (3.52%). Besides 22 patients (0.76%) had dual viral infections.

Conclusion: 4.15% of children and 2.42% of adults were suffering from HAV infection needing hospitalization indicating high infection of HAV in adults. 0.17% children and 0.48% of adults had HEV infection. HBV infection was present in 0.55% of children and 3.18% of adult patients. 0.24% of children and 3.52% of adult patients had HCV infection. Prophylactic vaccination against HAV infection is needed among children and adults from this region besides vaccination against HBV infection.

Keywords: Acute Viral Hepatitis, Chronic Viral Hepatitis, HAV, HEV, HBV, HCV

I. Introduction

Worldwide viral hepatitis in acute and chronic form remains a major cause of morbidity and mortality. Exposure to Hepatitis A Virus (HAV), Hepatitis E virus (HEV), Hepatitis B Virus (HBV) & Hepatitis C Virus infection vary in different parts of country among different socioeconomic groups. HAV and HEV are frequent causes of acute viral hepatitis (AVH) mostly in developing countries due to poor hygiene and consumption of contaminated food and drinks. Amongst chronic liver disease (CLD), Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) infection are the leading cause of morbidity in developing and developed country respectively. India is hyper-endemic for Hepatitis A and E [1]. Hepatitis E is the commonest cause of acute hepatitis in adults and hepatitis A is the commonest cause in pediatric age group [2,3]. HBV and HCV leads to chronic liver disease in adults as well as children. Superimposition of acute hepatitis A in patients with chronic hepatitis C has been associated with a particularly high mortality rate with an accelerated progression of chronic liver disease to decompensated liver disease. Prevalence of HAV, HEV, HBV and HCV among children, adolescents and adults admitted in super speciality hospital needs to be known.

II. Objectives

To know the prevalence of HAV, HEV, HBV, and HCV infection among children up to 12 years, adolescents between 13 yrs. To 18 yrs. and adults from this region attending Nehru Hospital, PGIMER, Chandigarh

III. Methodology

2892 patients (2011 Male, 881 Female) of acute and chronic liver disease with suspected viral etiology and admitted between January 2012 to July 2014 were included in the study. Clinical features of patients, routine diagnostic investigations including abdominal ultrasound were recorded. Complete liver function test (LFT), prothrombin time and ultrasonography was done on admission for each patient. Upper limit of normal for AST and ALT was 40 IU/L and for alkaline phosphatase was 170 IU/L. 2 ml blood was collected and serum stored at - 20°C. Serum samples were tested uniformly in all patients for anti HAV IgM (DSI, Italy), anti HEV IgM (DSI, Italy), HBsAg (Erba-Mannheim) and anti HCV (Erba-Mannheim) by ELISA. Results of ELISA tests were interpreted as per manufacturer's instruction.

IV. Results

Overall 125 children (4.32% ,125/2892) had acute viral hepatitis and 23 children had chronic viral hepatitis (0.79% ,23/2892) (Table I) .120 children (75 Male,45 Female, Mean age: 6.258 yrs. ±2.98 SD) of acute hepatitis and acute on chronic hepatitis were reactive for anti HAV IgM (4.15%,120/2892,) (Table II). 05 children were reactive for anti HEV IgM (0.17%, 5/2892). 16 children (13 Male,03 Female) of chronic liver disease were HBsAg (0.55%, 16/2892) reactive and 07 children had HCV (0.24%,7/2892) infection. 13 adolescents (0.44%,13/2892) had acute viral hepatitis and 5 adolescents (0.17%,5/2892) had chronic viral hepatitis. Among adolescents 09 patients were reactive for anti HAV IgM (0.31%,9/2892) and 04 adolescents had HEV (0.14%,4/2892) infection. 05 adolescents were HBsAg (0.17%,5/2892) reactive and 04 were having HCV (0.14%,4/2892) infection. Among adults,84 had (2.90% ,84/2892) acute viral hepatitis while 194 patients (6.70%, 194/2892) were suffering from chronic viral hepatitis. In 70 adult patients (58 Male,12 Female, Mean age: 43.029 yrs. ±13.75 SD) were reactive for anti HAV IgM (2.42%, 70/2892), 14 patients were reactive for anti HEV IgM (0.48%,14/2892). 92 adult patients (73 Male, 19 Female, Mean age: 46.354 yrs. ±15.43 SD) were HBsAg (3.18%, 92/2892) reactive.102 adult patients (82 Male, 20 Female, Mean age: 45.067 yrs. ±11.64 SD) of chronic liver disease were reactive for anti HCV (3.52%,102/2892). Besides, 22 patients (0.76%, 22/2892) including children, adolescents and adults had dual viral infections (Table III). None of the admitted patients had dual infections of HCV with HEV infection.

V. Tables

Table I. Patients with Acute & Chronic Viral Hepatitis

Patients	Acute Viral Hepatitis	Chronic Viral Hepatitis
Children (Mean Age: 6.258 yr.± 2.98)	4.32% (125/2892, 78 M,47 F)	0.79% (23/2892, 19 M,4 F)
Adolescent (Mean Age: 15.46 yr.± 2.98)	0.44% (13/2892, 9M,4F)	0.17% (5/2892, 4M,1F)
Adults (Mean Age: 43.029 yr.± 13.75)	2.90% (84/2892, 69 M,15 F)	6.70% (194/2892, 155 M,39F)

Table II. Viral Markers in Acute & Chronic Liver Disease Patients (n=2892)

Viral Markers	Children (Up to 12 yrs.)	Adolescents (13-18 yrs.)	Adults
Anti HAV IgM reactive	4.15% (120/2892, 75M & 45F)	0.31% (9/2892,6M&3F)	2.42% (70/2892,58M&12F)
Anti HEV IgM reactive	0.17% (5/2892,3M & 2F)	0.14% (4/2892,3M&1F)	0.48% (14/2892,8M&6F)
HBsAg reactive	0.55% (16/2892, 13M &3F)	0.17% (5/2892,2M&3F)	3.18%, (92/2892,73M&19F)
Anti HCV reactive	0.24% (7/2892, 4M &3F)	0.14% (4/2892,2M&2F)	3.52% (102/2892, 82M & 20F)

Table III. Dual Viral Infections (n=22, 0.76%)

Dual infections (Reactive)	Children (Up to 12 yrs.)	Adolescents (13-18 yrs.)	Adults
HBsAg + Anti HAV IgM	01	02	04
HBsAg + Anti HEV IgM	Nil	Nil	01
Anti HCV + Anti HAV IgM	Nil	01	13
Anti HCV + Anti HEV IgM	Nil	Nil	Nil

VI. Discussion

In present study shows that prevalence of HAV infection in admitted children is 4.15% (n=120 children) and 2.42% in adults (n= 70). India being an high endemic zone for Hepatitis A Virus the number of patients needing hospitalisation from this zone is alarming. This could be due to improved socio-economic status with improvement in hygiene. This can be ascertained from a study of medical students of Delhi among whom anti HAV IgG sero- prevalence was found to be 62.2% [4]. Although there is heterogenous exposure of

Hepatitis A virus in different parts of country due to variable hygiene levels. In another study on anti HAV sero-prevalence in Delhi in year 2000 showed the prevalence in persons more than 35 years was higher 92.1% (186/200 persons) than in subjects with 57% (170/298 persons) of less than 35 years [5]. This is due to improved hygiene in persons of less than 35 years during their childhood and adolescent periods in recent past compared to subjects of more than 35 years. A study in China showed HAV vaccination and changing life styles associated with booming economy has contributed to rapid decline in risks to acquire hepatitis A virus infection in China during a study period between 1990 and 2006 [6]. In present study acute viral hepatitis due to Hepatitis E virus (HEV) was found to be more in adults (0.48%, 14/2892) compared to 0.17% of children (5/2892). However only four adolescents had HEV infection. The sero-prevalence of HAV- and HEV-positive patients in acute viral hepatitis from a hospital of Mangalore, India showed 19.31% and 10.54%, respectively [7]. A study from a large multi-specialty military hospital located at Bangalore, India (Between 01 Jul 2003 to 31 Dec 2004) of 224 cases of acute viral hepatitis (175 males & 49 females, mean age group of 22.5 years) showed Hepatitis E was the commonest cause seen in 102 (45.5%) followed by hepatitis A in 74 (33%) and hepatitis B in 28 (12.5%) cases [8]. Study from a primary health centre on 2692 patients of acute viral hepatitis in Baghdad showed 44.8% of cases were positive for anti-HAV antibodies and another 1.6% had positive anti-HEV antibodies [9]. A study on 1932 patients with acute viral hepatitis from a hospital in Delhi showed 11.4% patients (221/1932) were positive for immunoglobulin M (IgM) anti-HAV. Also, a total of 300 patients with chronic liver diseases that were etiologically related to hepatitis B 56% (169/300) and HCV 24.33% (73/300) in the same study [10]. In present study among adult patients with chronic liver disease 3.18%, (92/2892) had HBV infection and 3.52% (102/2892) had HCV infection. A rise in HCV infection in adults is alarming, however only 0.24% (7/2892) of children had HCV infection possibly due to fetomaternal transmission. A study from Kenya showed 1.3% patients (5/382) having dual infection with Hepatitis A virus and Hepatitis B virus [11]. In present study 4 adults of chronic viral hepatitis due to HBV infection had acute exacerbations due to added new infection with Hepatitis A Virus acquired through feco-oral route. Similar dual infection of HBV and HAV was found in two adolescent and one child. This advocates the role of vaccination against HAV in chronic liver disease patients. A study from China demonstrates 40.1% patients (118/294) of HBV and HEV had dual infection among total of 294 HEV infected patients [12]. In present study only one adult had HBV with HEV infection. Hepatic flares occur in HCV infected patients with acute viral hepatitis A infection [13]. Hepatitis A virus (HAV) super-infection is associated with a high risk of liver failure and death in patients with Hepatitis C virus (HCV) infection. In present study 13 adult and one adolescent had HAV with HCV infection which needed hospitalisation. None among children had dual infection of HCV with HAV. A study from Brazil has advocated that anti-HAV testing of HCV infected patients is a cost-effective strategy and should be carried out before vaccination against HAV in patients with HCV infection [14]. However, there was no patient of HEV and HCV dual infection case in present study. This highlights the need for vaccination against Hepatitis A Virus and Hepatitis B virus in adults and children due to increasing trend of their infection.

VII. Conclusion

4.15% of children and 2.42% of adults were suffering from HAV infection needing hospitalization indicating high infection of HAV in adults. 0.17% children and 0.48% of adults had HEV infection. HBV infection was present in 0.55% of children and 3.18% of adult patients. 0.24% of children and 3.52% of adult patients had HCV infection. Prophylactic vaccination against HAV infection is needed among children and adults from this region besides vaccination against HBV infection.

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