



Clinical and Laboratory Profile of Acute Viral Hepatitis (Hepatitis A and Hepatitis E) in Hospitalized Patients In Age group between 5 -19 Years, A Study In North Kashmir India

¹Mohammad Saleem Chesti, ²Sheenam Gazala, ³Naveed Shahzad, ⁴Tansila Rashid, ⁵A. R. Khan

¹Pediatrician, ²Physician Specialist, ³Consultant Paediatrician, ⁴Post Graduate Student, ⁵Ex-HOD,
^{1,2,3}J & K Health Services

⁴SMHS, Hospital Srinagar J & K

⁵SKIMS Soura, Srinagar J & K

***Corresponding Author:**

Sheenam Gazala

Physician Specialist, J & K Health Services

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Abstract

Background: Acute viral hepatitis (AVH) continues to be a major public health problem in India. Hepatitis A and E viruses being most common causes of acute viral hepatitis, globally accounting for 10% deaths due to viral hepatitis. Both these viruses are endemic in India, and causes both epidemic and sporadic infections. The main objective of our study was to determine prevalence and to assess the clinical and laboratory profile, complications and outcome of AVH in patients in age group between 5 to 19 years.

Materials and Methods: A total of 80 children with the clinical diagnosis of AVH were included, our study was hospital based prospective observational study carried out from August 2017 to March 2020. Data on clinical features, laboratory parameters, immediate outcome, and treatment received were obtained, and analysis was performed. History of patients was recorded and blood samples collected to investigate possible hepatitis A and E infection.

Results: Out of 80 patients, HAV & HEV seroprevalence in AVH cases were found to be 58 patients and 19 patients respectively. Co infection of HAV and HEV was found in 3 patients. Common clinical features were jaundice (100%), anorexia (91.2%), fever (86.2%), pain abdomen (76.2%), nausea and vomiting (72.5%), splenomegaly (31.2%), itching (27.1%), bleeding (2.1%), and seizure (2.1%). Acute liver failure was seen in 2 (2.5 %) admitted patients and both survived. Both the infections demonstrated preponderance of male over female. Highest frequencies of HAV and HEV were found in age group of 5 -9 years. Seasonal distribution of both HAV and HEV infections followed a bimodal peak pattern with peaks reported in spring and rainy season.

Conclusion: HAV followed by HEV remains the commonest cause of acute viral hepatitis and acute liver failure. It can be controlled by improving basic sanitation and socio-economic status HAV and HEV infection may present with similar clinical features, and serological testing must be done to identify the cause.

Keywords: Hepatitis A, Hepatitis Clinical profile, Prevalence

Introduction

Viral hepatitis is a global public health problem, particularly hepatitis A and E being major communicable diseases in underdeveloped countries including India, an indicator of poor sanitization mainly in semi-urban and rural localities Hepatitis A virus (HAV) is a non-enveloped single stranded RNA

virus with incubation period of 15 to 45 days, feco orally transmitted and is responsible for 1.4 million new cases per year^{1,2}. Person-to-person transmission is common in HAV infection and is generally limited to close contacts³.

Typical symptomatic presentation in HAV infection includes non-specific prodromal symptoms like fever, weakness, malaise, anorexia, vomiting, nausea, myalgia's and arthralgias, these prodromal symptoms tend to decrease with onset of jaundice, although anorexia, malaise and weakness may persist or increase transiently. While as Jaundice lasts for several weeks which is followed by convalescent period. Peak infectivity in HAV occurs during two weeks before onset of jaundice or elevation of liver enzyme levels when concentration of virus in the stool is highest, while as with appearance of jaundice, the viral concentration in the stool decreases and majority of patients are non-infectious after one week^{3,4}

Regarding clinical expression almost 50% of children with HAV under 6 years of age are asymptomatic, while as from 6 years of age to adulthood, greater than 75% develop characteristic illness with jaundice and dark urine^{4,5}, while as in 0.2 % clinical cases HAV infection can rarely cause acute liver failure and death. Serological testing for detection of immunoglobulin M (IgM) antibodies to HAV (anti-HAV) is required to confirm the diagnosis, while as in majority of HAV patients IgM anti-HAV levels then decline in first six months

Also hepatitis E virus (HEV) is a single-stranded, non-enveloped RNA virus with incubation period of 2 to 10 weeks and is usually self-limited illness, Spreads mainly through faecal contamination of water supplies or food^{6,7}. Non-specific symptoms like mild fever, marked loss of appetite, loss of appetite, upper abdominal discomfort, nausea and vomiting, jaundice appears with the resolution of these non-specific symptoms and usually persists for 16 weeks and then gradually resolves. HEV infection occurs without any symptom or as a mild illness without jaundice in most of children's, while as in adults acute hepatitis E may have a prolonged cholestatic phase with significant itching. A small proportion (0.5 – 4 %) of HEV cases develop acute liver failure, which is higher in pregnant women (15 – 25 %) ⁹. Serum samples from case patients were tested for antibodies to hepatitis E virus (HEV, anti-HEV IgM) by enzyme-linked immunosorbent assay (ELISA).

Acute hepatitis (HAV and HEV) is usually diagnosed in presence of elevated liver enzymes (serum transaminases), the cut-off for diagnosis is usually

variable, ranging from an elevation of five to ten times upper limit of normal. Alkaline phosphatase (ALP) elevation is seen in all cases of acute hepatitis but is usually less than three times of upper limit of normal. The ALP elevation is proportionately less for the degree of jaundice if present⁸. India is endemic zone for HAV and HEV infection. Both epidemic and sporadic cases of infection by these viruses had been reported from different parts of India¹⁰.

Materials And Methods:

The present study was prospective observational study, conducted in department of Paediatrics, Maternal and Child Hospital Sopore, carried out from August 2017 to March 2020 after obtaining ethical clearance from institutional ethical committee. 80 cases of acute viral hepatitis due to HAV and HEV were included in our study. A detailed history, clinical examination was done at the time of admission, clinical assessment includes level of consciousness, icterus, pallor, facies organomegaly, hepatic tenderness, any signs of chronic diseases or biliary obstruction were detected after obtaining informed verbal consent from parent's Or guardians of patients.

After history and clinical examination, laboratory investigation like complete blood count, liver function test, KFT, Blood sugar, Coagulogram, viral markers like anti HAV and HEV IgM, hepatitis B surface antigen, and Anti HCV total antibodies, widal test, and USG abdomen were done on admission in all cases.

Inclusion Criteria:

1. Age group between 5 to 19 years of age presenting with clinical features of hepatitis.
2. Patients positive for viral markers like anti Hepatitis A or E IgM, or HbS Ag for HBV

Exclusion Criteria:

1. Patients with hemolytic diseases, Inherited metabolic disorders.
2. Chronic liver disease
3. Autoimmune hepatitis, Congenital abnormalities.
4. Recent history of hepatotoxic drug or toxin exposure
5. Diagnosed enteric fever/malaria

Results:

TABLE 1 :Age and Sex distribution of patients with Acute viral hepatitis (HAV &HEV)

AGE (YEARS)	FREQUENCY (N)	PERCENTAGE (%)
5 - 9	49	61.2%
10 - 14	17	21.2%
15 -19	14	17.5%
GENDER	FREQUENCY (N)	PERCENTAGE (%)
MALES	52	65%
FEMALES	28	35%

FIGURE 1 :Causative agents in Acute viral hepatitis

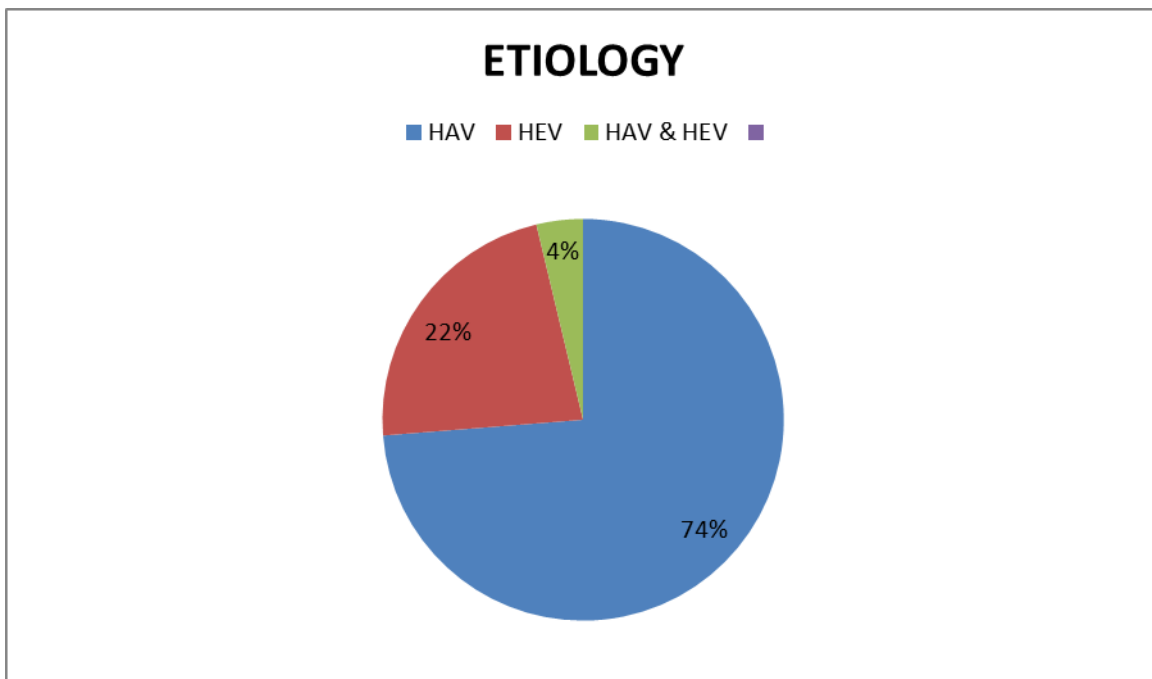


TABLE 2 : CLINICAL PROFILE IN ACUTE VIRAL HEPATITIS (HAV & HEV)

CLINICAL SYMPTOMS	FREQUENCY (N) (%)	PERCENTAGE
JAUNDICE	80	100
FEVER	69	86.2
ANOREXIA	73	91.2
NAUSEA & VOMITING	58	72.5
PAIN ABDOMEN	61	76.2
HIGH COLOURED URINE	62	77.5

PRURITIS	15	18.7
DIARRHEA	4	5

CLINICAL SIGNS IN ACUTE VIRAL HEPATITIS (HAV & HEV)

SIGNS	FREQUENCY (N)	PERCENTAGE (%)
ICTERUS	80	100
PALLOR	17	21.2
SPLEENOMEGALY	8	10
HEPATOMEGALY	63	78.7
ASCITES	2	2.5
EDEMA	4	5
TENDER HEPATOMEGALY	56	70

Table 3 :Age wise distribution according to type of acute viral hepatitis

AGE IN YEARS	HEPATITIS A		HEPATITIS E		COINFECTION WITH HEPATITIS A & E	
	FREQUENCY (N)	PERCENTAGE (%)	FREQUENCY (N)	PERCENTAGE (%)	FREQUENCY (N)	PERCENTAGE (%)
5-9	38	65.5	8	42.1	3	100
10- 14	11	18.9	6	31.5		
15-19	9	15.5	5	26.3		
TOTAL	58		19		3	

Table 4 : Sex distribution according acute viral hepatitis

GENDER	HAV		HEV	
	MALE	FEMALES	MALE	FEMALES
	FREQUENCY(N) & PERCENTAGE(%)	FREQUENCY (N)&PERCENTAGE(%)	FREQUENCY(N) & PERCENTAGE(%)	FREQUENCY(N) & PERCENTAGE (%)
5-9	23(46.9 %)	12(24.4 %)	6(12.2 %)	5(10.2 %)

10-14	9 (52.9%)	3(17.6 %)	2(11.7 %)	3(17.6%)
15-19	7 (50 %)	4 (28.5 %)	2 (14.2 %)	1 (7.1 %)
COINFECTION WITH BOTH HAV AND HEV=3 CASES, ALL WERE MALES				

Table 5: Distribution of HAV and HEV cases according to season

SEASON(MONTHS)	HAV		HEV	
	FREQUENCY(N)	PERCENTAGE(%)	FREQUENCY(N)	PERCENTAGE(%)
FEBRUARY TO MARCH	5	8.6	10	52.6
JULY TO AUGUST	32	55.1	2	10.5
REST OF MONTHS	21	26.2	7	36.8
COINFECTION WITH HAV AND HEV =3 CASES ,OCCURRED BETWEEN MARCH TO AUGUST				

Table 6 : Laboratory parameters in Acute Viral Hepatitis (HAV & HEV)

	HAV		HEV		COINFECTION(HAV & HEV)	
	FREQUENCY(N)	PERCENTAGE(%)	FREQUENCY(N)	PERCENTAGE(%)	FREQUENCY(N)	PERCENTAGE(%)
HEMOGLOBIN(g/dl)						
<12	18	22.5	6	7.5		
>12	41	51.2	12	15	3	3.7
WBC(Cumm)						
<10000	49	61.2	11	13.7	1	1.2
>10000	10	12.5	7	8.7	2	2.5

	HAV		HEV		COINFECTION (HAV & HEV)	
	FREQUENCY (N)	PERCENTAGE (%)	FREQUENCY(N)	PERCENTAGE (%)	FREQUENCY(N)	PERCENTAGE (%)
SERUM BILIRUBIN(mg/dl)						
<6	38	47.5	7	8.7		
>6	21	26.2	11	13.7	3	3.7
SGPT(ALT) U/L						

>45 -400	35	43.7	5	6.2	1	1.25
>400	24	30	13	16.2	2	2.5

	HAV		HEV		COINFECTION (HAV &HEV)	
SGOT(A ST) U/L	FREQUENC Y(N)	PERCENTAG E(%)	FREQUENC Y(N)	PERCENT AGE (%)	FREQUENCY(N)	PERCENTAG E(%)
>45-400	32	40	12	15		
>400	27	33.7	6	7.5	3	3.7
INR						
<1.5	51	63.7	16	20	3	3.7
>1.5	8	10	2	2.5		

Discussion:

Acute viral hepatitis is an important health problem in children's and adolescents in north India, especially in rural areas and in communities belonging to lower socioeconomic status due to unavailability of safe drinking water along with poor sanitation and poor personal hygiene.

Total number of cases in our study were 80, among which 48 (65 %) were males and 32 (35 %) were females, thus in our study male patients were predominant, this is consistent with other studies done by Behera MR et al¹¹. Also majority of cases (61.2%) were aged between 5-9 years of age this is consistent with study done by Singh et al¹², where 5-10 years age group was most common age of presentation with males (61%) and females (39%).

In our study, most common cause of acute hepatitis was hepatitis A (HAV) (72.5 %) followed by HEV (23.7 %); this is concordant with other study done by Poddar U et al¹³, where HAV infection is the most common cause (64.5%) acute viral hepatitis in children followed by HEV infection (16.3%). Various presenting. Regarding clinical symptoms and signs of viral hepatitis, in our study, icterus (100%) was the most common presenting sign then other

symptoms like anorexia (91.2%) followed by fever (86.2%), high colored urine (77.5%), pain abdomen (76.2%) were observed, the results are consistent with other studies as reported by Parekh Z et al¹⁴, where most common clinical feature was jaundice (94%) followed by fever (82%). In our study, hepatomegaly was present in most cases of viral hepatitis, while as splenomegaly was present in 20 % cases, these findings were consistent as reported by other studies as observed by Salahuddin M et al¹⁵ and Poddar U et al¹³.

In our study, highest rate of positivity of HEV infection was observed during month of February and March followed by July and August months, similar bimodal pattern regarding positivity of HAV infection was observed during July to August months followed by February and March, these findings regarding bimodal distribution of HAV AND HEV are consistent with other studies¹⁶. Increased positivity during these seasons may result due to contamination of drinking water due to rainy season and poor sanitation.

Also biochemical parameter provides good information regarding the extent of liver damage. Serum bilirubin and hepatic enzymes were elevated almost all the cases in our study. In our study,

patients with co-infection i.e. positive for HAV and HEV have higher transaminases activity in comparison to other groups indicating hepatic damage, these findings were consistent as reported by Ziauddin et al¹⁷. Above all in our study all cases recovered within 1 to 2 months with no mortality.

Conclusions:

Acute viral hepatitis is a major public health problem. HAV followed by HEV remains the commonest cause of acute viral hepatitis and acute liver failure. Both HAV and HEV are transmitted by faecoral route. General public should be educated regarding preventive measures including use of safe drinking water, proper hand hygiene, proper waste disposal with use of sanitary latrines to control the spread of viral hepatitis due to HAV and HEV. Regarding the clinical symptoms of acute viral hepatitis health education is also vital for general public for early identification thereby seeking early medical attention so that morbidity and mortality related to viral hepatitis can be reduced.

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