**Original article**

# Prevalence of Hepatitis viruses in Acute Hepatitis: Study at Tertiary Care Centre

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**ABSTRACT:**

**Introduction:** The present study was focused on the aetiology, clinical spectrum and Liver Function Tests of acute viral hepatitis (A, B, C, and E) with its prevalence.

**Material and methods**: Study enrolled 55 adult cases with clinical features suggestive of acute hepatitis with jaundice and abnormal liver function tests. Serum bilirubin, AST, ALT of these patients were recorded All the cases were screened for diagnosis of acute viral hepatitis by detection of IgM Anti-HAV, HBsAg , Anti-HCV and IgM Anti-HEV by ELISA.

**Observations and results:** Out of55 clinically suspected cases of acute hepatitis, 25 (45.4%) were confirmed as acute viral hepatitis. Out of these 25 acute viral hepatitis cases 19 (76%) were caused by hepatitis B virus and 6 (24%) were caused by hepatitis E virus. None of the case of acute viral hepatitis was due to Hepatitis A virus or Hepatitis C virus. In these patients mean serum bilirubin level was more in cases of acute hepatitis B compared to acute hepatitis E where as mean serum ALT and AST levels were more in acute viral hepatitis E than acute viral hepatitis B.

**Conclusion:** Viral etiology in clinically suspected cases of acute hepatitis is important since many of the clinical manifestations are indistinguishable. Serodiagnosis of acute viral hepatitis will help to initiate treatment at early stage so as to prevent their long term sequel especially in case of hepatitis B. Liver Function Tests such as serum bilirubin, serum AST and ALT of these patients should be checked for their appropriate management.

Keywords: Acute viral hepatitis-prevalence-clinical spectrum

## INTRODUCTION

Acute viral hepatitis is a serious public health problem affecting billions of people globally[1]. This is a major public health problem in India also and has been reported from all parts of this country[2]. For Hepatitis A virus and Hepatitis E virus, the primary source of infection is the faeces with feco-oral route being the most predominant mode of transmission[3]. Hepatitis B and Hepatitis C are blood borne viruses and are primarily transmitted through a breach in the skin by percutaneous or mucosal route. All viral hepatitis infections can present with acute manifestations[3].The most frightening aspect of this global epidemic lies in the fact that acute clinical signs and symptoms of the different types of acute viral hepatitis are similar regardless of the etiologic agent. Hence it is necessary to diagnose the specific aetiology of acute viral hepatitis[4].

The present study was aimed to know the etiological and clinical spectrum of acute viral hepatitis (A, B, C, and E) with its prevalence. An attempt was made to diagnose the viral etiology in clinically suspected cases of acute hepatitis with jaundice and abnormal liver function tests.

**AIMS & OBJECTIVES**

To identify the viral aetiology of clinically suspected cases of acute Hepatitis. To correlate the clinical spectrum and Liver function tests of acute viral Hepatitis cases with aetiological agent.

**MATERIAL AND METHODS**

This study was conducted in department of microbiology at a tertiary care hospital over a period of 2 years from Dec-2013 to Dec-2015. The study protocol was approved by ethical committee of the college. Fifty five adult cases with clinical features suggestive of acute hepatitis and abnormal liver function tests were included in the present study**.** Patients with jaundice less than six months duration were considered as acute hepatitis. Detail history of such 55 patients included in the present study was taken and Liver Function Tests consisting of serum bilirubin, AST, ALT were recorded. From each of the enrolled patients, 5-10 ml of venous blood was collected and serum was separated after centrifugation and then stored at -20˚C until further analyzed**.** All these 55 cases were screened for confirmed diagnosis of viral hepatitis such as A, B, C or E by ELISA.

Following commercially available ELISA Tests were performed with all samples included in the study.

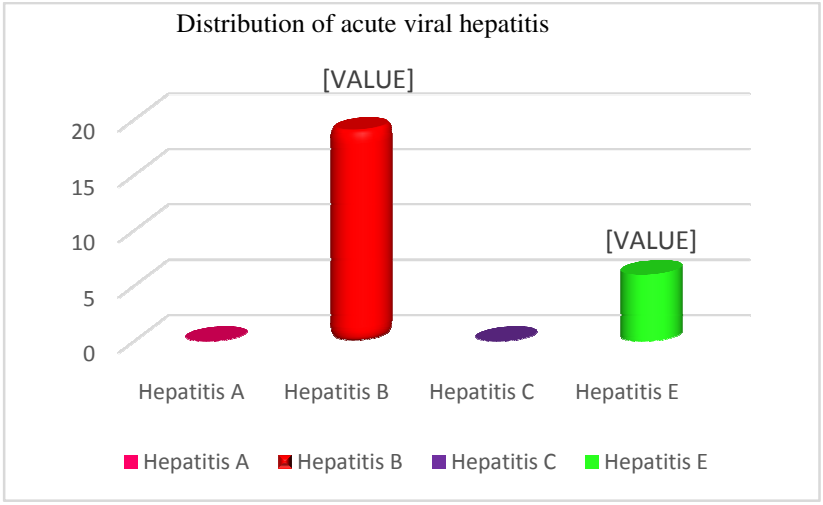
1) IgM Anti-HAV by ELISA (DIA.PRO)
2) HBsAg by ELISA (ERBA LISA)
3) Anti-HCV by ELISA (QUALISA)
4) IgM Anti-HEV by ELISA (DIA.PRO).

All ELISA tests were performed as per the manufacturer's kit instructions.

**OBSERVATIONS AND RESULTS**

A total of 55 patients with clinically suspected acute hepatitis with Jaundice along with abnormal Liver function Tests were included in present study. In this study, maximum number (54.5%) of patients belonged to age group of 41-50 years followed by 31-40 (36.3%) years. Out of 55 clinically suspected cases of acute hepatitis, 25 (45.4%) were found to be confirmed as acute viral hepatitis.

**TABLE 1: Distribution of Acute viral hepatitis**



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Out of twenty five confirmed cases of acute viral hepatitis maximum were of hepatitis B (76%) followed by hepatitis E (24%).Thisdifference between prevalence of acute viral hepatitis B and acute viral hepatitis E among the total 25 confirmed cases of acute viral hepatitis was found to be statistically significant. (Chi square=6.76, P<0.05) None of the case of acute viral hepatitis out of 25 was found to be of Hepatitis A virus or Hepatitis C virus.

**Table 2 Signs and symptoms of Acute Viral Hepatitis**

| Clinical features | Hepatitis E N-06 | Hepatitis B N-19 | Total |
|---|---|---|---|
| | Number (%) | Number (%) | Number (%) |
| Fever with chills | 4(66.6) | 12(63.2) | 16(64) |
| Pain in abdomen | 5(83.3) | 14(73.7) | 19(76) |
| Vomiting | 2(33.3) | 10(52.6) | 12(48) |
| Diarrhoea | 2(33.3) | 00 | 02(8) |
| Clay colored stool | 3(50) | 00 | 03(12) |
| Hepatomegaly | 3(50) | 13(68.4) | 16(64) |
| Splenomegaly | 00 | 04(21) | 04(16) |



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The most common presenting clinical feature of acute viral hepatitis caused by hepatitis E Virus and Hepatitis B Virus was pain in abdomen (76%) followed by fever with chills (64%) and Vomiting (48%).

Two cases (33.3%) of acute viral hepatitis E presented with diarrhoea where as in these cases three patients (50%) had clay colored stool. None of the case of acute viral hepatitis B had diarrhoea or clay coloured stool.

In acute viral hepatitis E Hepatomegaly was present in 3 cases (50%) where as in acute viral hepatitis B it was in 13 cases (68.4%). Splenomegaly was present in four cases (21%) of acute viral hepatitis B which was absent in acute viral hepatitis E.

**Table3 Liver function tests in Acute Viral Hepatitis**

| Test | Hepatitis E | | Hepatitis B | |
|---|---|---|---|---|
| | Observed Range | Mean value | Observed Range | Mean value |
| Sr.bilirubin | 4-10 mg/dl | 6.9 mg/dl | 2-20 mg/dl | 9.34mg/dl |
| ALT | 1000-2000 IU/L | 1258 IU/L | 100-1500 IU/L | 878.60IU/L |
| AST | 1000-1500 IU/L | 1185IU/L | 100-1500 IU/L | 682.47 IU/L |

The mean serum bilirubin level was more in cases of acute hepatitis B compared to acute hepatitis E but this difference in serum bilirubin levels was statistically not significant (Unpaired t test= 1.674, P=0.108) The mean serum ALT levels were more in cases of acute hepatitis E compared to acute hepatitis B. This difference in mean serum ALT levels was statistically significant (Unpaired t test=2.643, P=0.015) The mean serum AST levels were more in cases of acute viral hepatitis E compared to acute viral hepatitis B. This difference in mean serum AST levels was statistically significant (Unpaired t test=3.675, P=0.001)

**DISCUSSION**

The study was comprised of total number of 55 clinically suspected cases of acute hepatitis with Jaundice and abnormal liver function tests. Out of 55 patients, maximum number ((54.5%)) of patients was in age group of 41to50 years followed by 31 to 40 years (36.3%) of age group. Out of 55 clinically suspected cases of acute hepatitis, twenty five (45.4%) were found to be of viral aetiology. Among 25 acute viral hepatitis cases in present study, 19 (76%) cases were of acute viral hepatitis B where as 06 (24 %) cases were of acute viral hepatitis E.



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In present study none of the acute viral hepatitis due to Hepatitis A was found. The reason could be acute hepatitis A is more prevalent in children as compared to adults[5] and in the present study paediatric age group was excluded. Also it was a hospital-based study and sub-clinical or mild acute cases of acute viral hepatitis A may not get admitted to the hospital. Kaur R et al[6] also concluded that in hospital based study prevalence of acute hepatitis A is less (1.7%). Also none of the acute viral hepatitis case of Hepatitis C was found in the present study. Reason could be most of the cases of acute infection by HCV are usually asymptomatic with unaware of underlying infection.[7]

Prevalence of acute viral Hepatitis B (76%) in present study was comparable to study by Holgado GM et al[8](85.7%) but it was less as compared to study by Tandon BN et al[9] (42%), Jain Pet al[10] (25.9%) and IrshadM et al[11] (12%)Prevalence of acute viral hepatitis B changes as per geographical region[12.]This could be the reason that prevalence of acute viral hepatitis B in present study was comparatively higher than other studies by Tandon BN et al[9], Jain P et al[10], IrshadM et al[11]. The next cause of acute viral hepatitis in present study was hepatitis Ewith its prevalence of 24% which was comparable with study by IrshadM et al[11] (25.3%) and Jain P et al[10](23.14%)

Among the 25 confirmed cases of acute viral hepatitis, viral aetiology due Hepatitis B were found to be more (76%) as compared to that of viral hepatitis E (25%).This difference was found to be statistically significant. ($P<0.05$) The finding of more prevalence of acute Hepatitis B than acute hepatitis E was in line with study by Gomatos PJ et al[14], Ayoola A et al[15].

The most common presenting clinical feature of acute viral hepatitis cases was pain in abdomen (76%) followed by fever with chills (64%).Majority of clinical features of acute hepatitis B and E were found to be similar. This suggests that etiology of acute viral hepatitis such as Hepatitis B Virus or Hepatitis E Virus is necessary for proper management of the patients as they are clinically indistinguishable.

In cases of acute Hepatitis B, pain in abdomen and fever with chills were the presenting clinical features in 73.7% and 63.2% cases respectively. These results were in line with studies by Holgado GM et al[8], Kaur H et al[16]. Hepatomegaly was present in 68.4% of patients of acute hepatitis B which was comparable to similar study by Holgado GM et al[8] and it was lower in study by Kaur H et al[16] which showed 38.61%. Splenomegaly was present in 21% in acute hepatitis B cases which was comparable to similar study by Kaur H et al[16].

In present study among acute viral hepatitis due to Hepatitis E, most common presenting symptoms along with jaundice were pain in abdomen (83.3%) and fever with chills (66.6%) which was comparable to study by SargunaP et al[17], ModiT et al[18], Dalton HR et al[19]. A study by Bashir R et al[20] found that 40% cases had fever which was lower compared to present study while 80% cases in their study had abdominal pain which was comparable to present study. Hepatomegaly was present in three (50%) cases of acute viral Hepatitis E which was comparable to studies by SargunaP et [a17], SubbarayuduB et al[21], Nandi GC et al[22].Three cases (50%) of acute viral hepatitis E had history of clay colored stool were. These symptoms were also present in similar studies by SargunaP et al[17], Murthy KA et al[23].

Among acute viral hepatitis B cases in the present study serum bilirubin level range was from 2-20 mg/dl with a mean bilirubin level of 9.3mg/dl. A study by Holgado GM et al[8] showed mean bilirubin level 13.8 ± 9.2mg/dl



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in acute hepatitis B cases which was comparable to present study. SalehiM et al[24]also found that mean serum bilirubin level in 47 cases of acute hepatitis B was 8.8.±12.6 which was similar to present study.

The present study found that the average serum bilirubin level was in range of 4-10 mg/dl with mean of 6.9 mg/dl in cases of acute viral hepatitis E which was comparable to studies by Dalton HR et al[19], KhurooMS et al[25]. Murthy KA et al[23] in their similar study found that mean serum bilirubin level to be 11.33mg/dl which was more than present study. In a study by Modi T et al[18] noted that serum bilirubin was in range of 2.1-10 mg/dl which was comparatively lower than present study. Mean serum bilirubin level was more in cases of acute hepatitis B compared to acute hepatitis E. This difference was statistically not significant (P=0.108). In acute viral hepatitis B cases of the present study mean serum ALT level was 878.60 IU/L. In a study by Arora DR et al[26] of 70 acute viral hepatitis B cases found that mean ALT level was 699 IU/L which was comparatively lower to the present study. SalehiM et al[24] found mean serum ALT level in 47 cases of acute hepatitis B was 1049 IU/L which was higher compared to present study. In present study in acute viral hepatitis E cases ALT was found in range of 1000-2000 IU/L with a mean value of 1258 IU/L. A study by Dalton HR et al[19] noted that among 40 cases of acute viral hepatitis E,ALT was in range of 50–3346 IU/L with a mean serum ALT level of 1380 IU/L which was comparable to present study. In a study by TM Modiet al[18] noted 43% of patients presented with ALT in range of 500-1,000. The mean serum ALT levels were more in cases of acute hepatitis E compared to acute hepatitis B. This difference was statistically significant (P=0.015)

Acute hepatitis cases of Hepatitis B of present study mean serum AST level was 682.47 IU/L which was in concordance with a study by Arora DR et al[26] of 70 acute viral hepatitis B cases which showed 632 IU/L serum AST level. Among acute viral hepatitis E cases AST was found to be raised than normal level in present study and showed a range of 1000-1500 IU/L with a mean value of 1185 IU/L In a study by Murthy KA et al[23] observed 280 patients out of 290 patients of viral hepatitis E showed raised serum AST levels which was comparable to present study. Xu B et al[27]studied acute viral hepatitis E in 70 patients with jaundice showed serum AST levels 660.83 ± 675.99 IU/L which was lower than present study. The mean serum AST levels were more in cases of acute viral hepatitis E compared to acute viral hepatitis B. This difference in level of serum AST in hepatitis E and B was statistically significant (P=0.001)

Liver Function Tests such as serum bilirubin level, serum AST level or serum ALT levels may vary in acute viral hepatitis due to Hepatitis B virus or Hepatitis E virus. Reason could be in hospital based study levels of liver Function Tests will depend on the stage at which patient will get admitted to the hospital.

All hepatitis viruses A, B, C, and E can present as acute hepatitis. It is important to know the etiological agent in clinically suspected cases of acute hepatitis with jaundice and abnormal liver function tests since many of the clinical manifestations are indistinguishable. Hence it is an essential step for establishing confirmed diagnosis of acute viral hepatitis to initiate treatment at early stage so as to prevent their long term sequel viz. cirrhosis and hepatocellular carcinoma especially in case of hepatitis B. Liver Function Tests of all the cases need to be checked for proper management and to know the prognosis of these patients .This institution based study had several limitations like small sample size and final outcome of the patients was not looked for. These factors could well underestimate the results obtained.



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**CONCLUSION:**

Present study was a hospital based study of the clinical spectrum and viral aetiology of clinically suspected cases of acute Hepatitis with Jaundice and abnormal Liver Function Tests. It is important to know the aetiology of acute viral Hepatitis cases as signs and symptoms of these patients are indistinguishable. Mean serum bilirubin level was more in cases of acute hepatitis B compared to acute hepatitis E where as mean serum ALT and AST levels were more in acute viral hepatitis E than acute viral hepatitis B.Liver Function Tests of these patients with acute viral hepatitis need to be checked for accurate management. Serodiagnosis is essential for accurate diagnosis of acute viral hepatitis. Diagnosis of acute viral hepatitis with correct aetiology is required to initiate the treatment at early stage and to prevent their long term sequel.

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