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## Original Research Article

## Frequency of Hepatitis E virus infection in patients with acute hepatitis

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## ABSTRACT

**Context:** Hepatitis E virus causes a self-limiting viral infection, transmitted by feco-oral route. HEV infection is major health problem worldwide, with a higher incidence in developing country.**Aim & Objectives:** To determine the frequency of HEV infection in patient with acute hepatitis and describe the frequency of HEV in different sex and age groups.**Materials and Methods:** From January 2019 to December 2020, Serum samples from clinically suspected acute viral hepatitis cases were collected and sent to the department of microbiology maintaining precautions. These were processed for the detection of HEV- specific Immunoglobulin M antibodies carried out rapid card test which is based on immunochromatography.**Result:** The seroprevalence of HEV (11.79%), HEV infection is slightly higher in female (52%) as compare to male (48%) and HEV infection was most commonly seen in adults (age group 21-30 years)**Conclusion:** The best means of reducing the spread of infection is by promoting simple measure of personal and community hygiene. However, these data will be useful for planning of future vaccination and for better sanitation. This study also helps the local organizations for maintaining the proper hygiene condition and supply purified water which can help to reduce the prevalence of Hepatitis E virus.

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## 1. Introduction

Five hepatotropic viruses are the causative agent of viral hepatitis, i.e., Hepatitis A, B, C, D and E Virus, and Hepatitis E Virus, presents a significant pathological state globally. In these viruses, currently established virus is Hepatitis E virus because it becomes a main etiological representative spread enterically.<sup>1</sup> Some studies in Asian nation are large epidemics of liver disease which are transmitted through water, originally associated to infectious disorders caused by hepatotropic virus, prompt the presence of a new discovered sort of hepatitis which is transmitted enterically, that was suggested a name

hepatitis E.<sup>2,3</sup> In 1983 hepatitis E virus was discovered by researchers of a deadly disease of unexplained liver disease in Soviet troopers in Afghanistan.<sup>4</sup> When a team member of analytical section ate feculent content of infected armed forces caused AVH (acute viral hepatitis) and while observing stool under microscope infective agent particle was seen. In fected macaques sequenced mistreatment liver samples were obtained and afterward cloned them with the help of infective agent.<sup>5,6</sup> For detection of HEV (hepatitis E virus) antibodies an Enzyme bioassay was conjointly developed.<sup>7</sup> HEV primary strains, pig HEV, was known and characterised from pigs within the US.<sup>8</sup> In 1955-56 first well studied epidemic infection of Hepatitis in New-Delhi, poignant a complete of twenty nine thousand people; this occurred because of feculent contamination

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of drinking water.<sup>1</sup> Though originally thought of to be a pandemic of infectious hepatitis-A, stored sera is used in retrospective testing from the infected patients prompt that a completely unique virus was responsible.<sup>1</sup> Since the 1990, after analytical study and sequence of genome, infection of liver as result of this infective particle was referred as Hepatitis E and particle was called HEV.<sup>9</sup> A quarter of total expecting ladies are at greater risk to infection more so in their 28-40 weeks of pregnancy and this might be unique attribution of the virus.<sup>10,11</sup> It is believed that regarding India, major infective vehicle of liver disease via digestive tract which isn't caused by Hepatitis A is believed to be Hepatitis E virus.<sup>12</sup> Currently Hepatitis E Virus is recognized because the commonest explanation for acute hepatitis worldwide.<sup>13–15</sup>

## 2. Material and Methods

A prospective observational study was carried out for one year in the Teerthanker Mahaveer edical college & research center (TMMC&RC) Moradabad from January 2020 to December 2020. Total 195, Hepatitis-E assumed affected cases be in use during this report. Patients of all age group with a clinical symptom such as fatigue, itching, pyrexia, nausea and jaundice are incorporated in this study. The sample was transported to the microbial.

### 2.1. Collection of sample

5ml blood sample was collect through Venipuncture as of every tolerant. The patient upper limb be joined by means of a tourniquet and alcohol character be use intended for disinfection. Then every bloods sample was transferred into a labeled plastic microtitre tube plane vial.<sup>16</sup>

### 2.2. (Venipuncture process)

The Venipuncture procedure is complex requiring both knowledge and skill to perform.<sup>16</sup>

Patients were identified for blood collection.

1. Tourniquet was applied 3.5-4.2 inches above the selected puncture site and tourniquets were not placed too tightly.
2. Puncture site was disinfected with 72% ethanol.
3. Allowed to air dry through the skin onto lumen vein.<sup>16</sup>
4. Hepatitis-E virus speedly card test method following Immunochromatography.
5. Sample was self-collected, in the plain vial.
6. Collected sample were sent to the research laboratory with the requisition.<sup>16</sup>

#### 2.2.1. Serological-diagnosis

Hepatitis-E virus antibodies were checked using speedly investigative kits.<sup>16</sup>

### 2.2.2. Hepatitis- E virus card method

Insight Hepatitis-E virus IgM is a speedly, self-performing, Immunochromatography.<sup>16</sup>

## 3. Result

**Table 1:** Hepatitis E positive and hepatitis E negative patients in total 195 clinical samples.

S. No	HEV positive patients	HEV negative patients	Total HEV patients
Male	11		
Female	12	172	195
Total	23		

Hepatitis-E positive cases =23

Hepatitis-E negative cases = 172

Out of sample in this thesis = 195

**Table 2:** The sex wise distribution Hepatitis-E positive cases

S.No	Test	Male		Female	
		Case	Per %	Cases	Per %
	Immuno-Chromatographic	11	48%	12	52%

23 Hepatitis E Virus Positive Cases

11 (48%) were male &

12(52%) were female having HEV infections.

**Table 3:** Age wise distribution of Male and Female present Hepatitis E infection.

Age	HEV positive male	HEV positive females	Total HEV male and female
10-20	3	1	4
21-30	3	5	8
31-40	3	3	6
41-50	-	3	3
51-60	1	-	1
>61	1	-	1
Total	11	12	23

Age group of 21-30:-8 hepatitis E positive cases

Age group of 31-40:- 6 hepatitis E positive cases

Age group of 10-20:- 4 hepatitis E positive cases

Age group of 41-50:- 3 hepatitis E positive cases

Age group of 51-60:- 1 hepatitis E positive cases

Age group of >60:- 1 hepatitis E positive cases

## 4. Discussion

Hepatitis E virus infection can be seen worldwide but the prevalence rate of hepatitis infected population is highest in South and East Asian region. HEV infections are the most usual reason for not only isolated cases but also epidemic of acute hepatitis infection in India.<sup>17</sup> Studies show that Hepatitis E virus has an intersecting course in pregnant

women and pregnant women are at high risk of hepatitis E infection particularly in second and third trimester and due to this possibility of maternal complications such as postpartum haemorrhage, premature rupture of membrane. Medical complications such as coagulation failure, hepatic encephalopathy, fetal complication like preterm absorption still births, are increased.<sup>17</sup>

Western UP, being an industrial hub and region of better job opportunities has lead to the migration of people flocking to have better socio-economic condition. This resulted in extra burden in the health care system of this region. However, it takes time to pull oneself out of poverty and more often life of people doesn't change much. Harsh realities, debt and challenging situations make migrants more susceptible and vulnerable to infectious disease than local people.

In our study the frequency of HEV 11.79% different age groups this rate of infection is almost similar to the study of Mittal A et al (2016),<sup>18</sup> in which rate of hepatitis E infection is 14.9%, our study differ from study of Chandra N S et al (2013)<sup>19</sup> and P. Jain et al (2013).<sup>20</sup> In this study Hepatitis-E reactive cases are 49.7% and 17.97%. Show that high prevalence of hepatitis-E positive cases, this rate show that in this locality prevalence of Hepatitis E virus is lower as compare to other regions of India.

In our study gender wise distribution of Hepatitis E 11(48%) were male and 12 (52%), which show difference from other studies like Mittal A et al (2016),<sup>18</sup> in which 69.76% were males and 30.23% were female and Chandra N S et al (2013)<sup>19</sup> distribution of hepatitis E infection is 67.73% males and 34.26% females, this study show that susceptibility of female population is much more due lack of awareness about the diseases and transmission of infection patients do not present to medical care facilities and try to treat jaundice like symptoms by themselves.

Our study found that Hepatitis E primarily affects adults between age group of 21 to 40 which is similar to the study of Chandra N S et al (2013).<sup>19</sup> The data shows the drift in infection regarding the age group. This drift is unique feature of epidemiology of HEV and has been observed by many other Indian researchers. As socio-economic status of individuals improve along with health care system of surrounding, exposure to infection caused by HAV in children has decreased dramatically. Therefore, we can drive from this that there is eventual change in the age group infected from HEV from childhood to adult age group Kaur et al (2017).<sup>21</sup> And a complementary study Aggrawal S et al (2017)<sup>22</sup> shows high prevalence in common age group of 3-18 years, this shows that hepatitis E virus infects young children and adults.

## 5. Conclusion

Result represented important information and association in Hepatitis E Positive cases.

Study is based on a sample size and it gives basic information towards infected patients with Hepatitis E Virus.

Females 12(52%) were more affected by the Hepatitis-E virus infection as compare to Males 11(48%).

Our finding concludes that most common mode of transmission of Hepatitis-E virus is Faeco-oral route (contamination food and water).

Prevalence of HEV in patients attending Teerthanker Mahaveer hospital was very low in compare to the general population in India.

HEV still remains as a major culprit of infectious diseases globally. Both susceptible and infected individuals might exist side by side in rapidly evolving societies. Hence, isolated cases and epidemic infection caused by HEV will stand as a concern in these places. This requires proper information regarding mode of transmission of infection caused by HEV and precautionary measure that can be undertaken to prevent it.

Hygienic practices for prevention of HEV infection include hand washing, avoid drinking tap water and raw meat products in area with poor sanitation, and heating foods nearly >85<sup>0</sup> c for one minute.

## 6. Conflict of Interest

The authors have stated explicitly that there are no conflicts of interest in connection with this article.

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