

## Seroprevalence of Hepatitis E Virus at Palanpur in North Gujarat

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### Original Research Article

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**Abstract:** Hepatitis E virus (HEV), transmitted through the fecal–oral route is a common cause of self-limiting acute viral hepatitis in India with poor sanitation and hygiene and poses a major public health problem in India. This study was undertaken to determine seroprevalence of HEV in patients presenting with acute viral hepatitis. A retrospective study was conducted in Central Laboratory, General Hospital, Palanpur, North Gujarat from October 2016 to July 2018. A total of 164 serum samples of suspected patients of HEV were tested for IgM HEV antibody using ELISA method. Seroprevalence of HEV was 62.20%. Out of 102, 70 (68.63%) males were affected more than females (31.37%). HEV infection was more common in 16-25 years age group (38.24%) followed by 26-35 years age group (24.51%). To reduce the prevalence of HEV infection, health and civic authorities should make an effort to increase the awareness among general public, to facilitate the timely preparation and make necessary arrangement for efficient response to encounter outbreak or epidemic caused by HEV virus, thus reduce morbidity, mortality and economic burden.

**Keywords:** Hepatitis E virus (HEV), acute viral hepatitis, ELISA, seroprevalence.

### INTRODUCTION

Viral hepatitis, caused by any of the five hepatotropic viruses, i.e., hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV), and hepatitis E virus (HEV), represents a major health problem worldwide. Among the viruses, HEV is now established as the major etiological agent of enterically transmitted non-A, non-B hepatitis [1].

The letter 'E' stands for 'enteric', 'epidemic', or 'endemic', all of which are features that adequately describe the epidemiology of HEV. A high case fatality rate averaging around 20% in pregnant women, particularly in the third trimester, is a characteristic feature of HEV infection [2, 3]. HEV is regarded as the major etiological agent of enterically transmitted non-A hepatitis in India [4]. HEV is responsible for both sporadic and epidemic outbreaks of acute viral hepatitis in developing countries, like India with poor sanitation and hygiene and poses a major public health problem in India leading to a self-limiting disease. Hepatitis E is found worldwide, but the prevalence is highest in East and South Asia [5]. In areas with high disease endemicity, symptomatic infection is most common in young adults aged 15–40 years. In these areas, although infection does occur in children, they often have either no symptoms or develop subclinical illness. Every year, there are an estimated 20 million HEV infections worldwide, leading to an estimated 3.3 million

symptomatic cases of hepatitis E. WHO estimates that hepatitis E infection caused approximately 44,000 deaths in year 2015 [6]. Hepatitis E virus (HEV) is a non enveloped, positive sense, single stranded positive sense RNA virus in the genus *Hepevirus* of the family *Hepeviridae* [7]. It has a longer incubation period and mainly affects older children and adults. So present study was undertaken to determine seroprevalence of HEV in patients presenting with acute viral hepatitis.

### MATERIALS AND METHODS

A retrospective study was conducted in Central Laboratory, General Hospital, Palanpur, North Gujarat from October 2016 to July 2018. A total of 164 serum samples of suspected patients of HEV were tested for IgM HEV antibody using ELISA method.

### RESULTS

Out of 164, 102 samples were positive for IgM HEV antibody. So seroprevalence of HEV was 62.20%.

**Table-1: Prevalence of HEV infection**

Total samples	No of positives (%)	No of negatives (%)
164(100%)	102(62.20%)	58(37.80%)

**Table-2: Sex distribution of HEV infection in patients presenting with acute viral hepatitis**

Sex	Number of positive cases (%)
Male	70(68.63%)
Female	32(31.37%)
TOTAL	102(100%)

From the table 2, 70(68.63%) male patients were positive for IgM anti-HEV antibody more than females (31.37%).

As per Table-3, HEV infection was maximum in 16-25 years age group(38.24%) followed by 26-35 years age group (24.51%) and 36-45 years age group(14.7%). The positivity of HEV infection in children were 13.72%.

**Table-3: Age distribution of HEV infection in patients presenting with acute viral hepatitis**

Age group (years)	Number of positive cases	(%)
0-4	10	9.8
5-15	4	3.92
16-25	39	38.2
26-35	25	24.5
36-45	15	14.7
46-55	6	5.87
56-65	2	1.96
>65	1	0.99
TOTAL	102	100

**Table-4: Comparison of different studies on prevalence of HEV in India**

Sr. No.	Author	Year	Place	HEV%
1	Radhakrishnan <i>et al.</i> , [8]	2000	Vellore	17.30%
2	Kaur <i>et al.</i> , [9]	2002	New Delhi	58.85%
3	Hussain <i>et al.</i> , [10]	2006	New Delhi	26.20%
4	Kumar <i>et al.</i> , [11]	2007	Chandigarh	38.60%
5	Irshad <i>et al.</i> , [12]	2010	New Delhi	25.30%
7	Chandra <i>et al.</i> , [13]	2012	Jaipur	48.30%
6	Jain <i>et al.</i> , [14]	2013	Lucknow	27.40%
8	Das A K <i>et al.</i> , [15]	2013	Dibrugarh	20.47%
9	Arora <i>et al.</i> , [16]	2013	Punjab	78.78%
10	Manoj Kumar <i>et al.</i> , [17]	2015	Ranchi	11.73%
11	Present study	2018	Palanpur	62.20%

## DISCUSSION

The prevalence of HEV was 62.20% in our study which was comparable to study done by Kaur *et al.*, [9] (58.85%) and Arora *et al.*, [16] (78.78%). From above table the prevalence of HEV in India was vary from 11.73% to 78.30% due to the regional differences, urban rural differences amongst the study population condition, difference in sewage and sanitation systems and public awareness about defecation in open fields which can contaminate surface drinking water source.

In our study prevalence of HEV infection was more in adults (16-45 years) in comparison to children (<15 years). Other Indian authors also observed the similar finding [13, 18].

Prevalence of HEV was higher in males than in females, this finding is consistent with other studies [19-21]. It could be because men have more exposure to outside food and drinking material for their professional purpose and social activities.

Prevention is the most effective approach against acute viral hepatitis. At the community level, transmission of HEV can be reduced by: maintaining quality standards for public water supplies and establishing appropriate sewage disposal systems. On an individual level, infection risk can be minimized by: maintaining hygienic practices such as hand-washing with clean water after using toilet, particularly before handling food and avoiding consumption of water and/or food of unknown purity.

Drainage line must be kept away from drinking water line by civic authority during town planning.

## CONCLUSION

To reduce the prevalence of HEV infection, health and civic authorities should make an effort to increase the awareness among general public, to facilitate the timely preparation and make necessary arrangement for efficient response to encounter outbreak or epidemic caused by HEV virus, thus reduce morbidity, mortality and economic burden.

## REFERENCES

- Ishwanathan, R. (1957). Infectious hepatitis in Delhi (1955–1956): a critical study. *Indian J Med Res*, 45, 1-29.
- Khuroo, M. S., Teli, M. R., Skidmore, S., Sofi, M. A., & Khuroo, M. I. (1981). Incidence and severity of viral hepatitis in pregnancy. *The American journal of medicine*, 70(2), 252-255.
- Jaiswal, S. P. B., Jain, A. K., Naik, G., Soni, N., & Chitnis, D. S. (2001). Viral hepatitis during pregnancy. *International Journal of Gynecology & Obstetrics*, 72(2), 103-108.
- Kumar, S., Ratho, R. K., Chawla, Y. K., & Chakraborti, A. (2007). The incidence of sporadic viral hepatitis in North India: a preliminary study. *Hepatobiliary Pancreat Dis Int*, 6(6), 596-599.
- Travasso, C. (2014). Indian government plans 10 regional laboratories to estimate hepatitis burden.
- World Health Organization. [www.who.int/mediacentre/factsheets/fs280/en/](http://www.who.int/mediacentre/factsheets/fs280/en/)(last updated July 2017).
- Labrique, A. B., Thomas, D. L., Stoszek, S. K., & Nelson, K. E. (1999). Hepatitis E: an emerging infectious disease. *Epidemiologic reviews*, 21(2), 162-179.
- Radhakrishnan, S., Raghuraman, S., Abraham, P., Kurian, G., Chandy, G., & Sridharan, G. (2000). Prevalence of enterically transmitted hepatitis viruses in patients attending a tertiary--care hospital in south India. *Indian journal of pathology & microbiology*, 43(4), 433-436.
- Kaur, R., Gur, R., Berry, N., & Kar, P. (2002). Etiology of endemic viral hepatitis in urban North India. *Southeast Asian journal of tropical medicine and public health*, 33(4), 845-848.
- Hussain, Z., Das, B. C., Husain, S. A., Murthy, N. S., & Kar, P. (2006). Increasing trend of acute hepatitis A in north India: Need for identification of high-risk population for vaccination. *Journal of gastroenterology and hepatology*, 21(4), 689-693.
- Kumar, S., Ratho, R. K., Chawla, Y. K., & Chakraborti, A. (2007). The incidence of sporadic viral hepatitis in North India: a preliminary study. *Hepatobiliary Pancreat Dis Int*, 6(6), 596-599.
- Irshad, M., Singh, S., Ansari, M. A., & Joshi, Y. K. (2010). Viral Hepatitis in India: a report from Delhi. *Global Journal of Health Science*, 2(2), 96.
- Chandra, N. S., Sharma, A., Rai, R. R., & Malhotra, B. (2012). Contribution of hepatitis E virus in acute sporadic hepatitis in north western India. *The Indian journal of medical research*, 136(3), 477.
- Jain, P., Prakash, S., Gupta, S., Singh, K. P., Shrivastava, S., Singh, D. D., ... & Jain, A. (2013). Prevalence of hepatitis A virus, hepatitis B virus, hepatitis C virus, hepatitis D virus and hepatitis E virus as causes of acute viral hepatitis in North India: a hospital based study. *Indian journal of medical microbiology*, 31(3), 261.
- Das, A. K., Ahmed, S., Medhi, S., & Kar, P. (2014). Changing patterns of aetiology of acute sporadic viral hepatitis in India--newer insights from north-east India. *International Journal of Current Research and Review*, 6(19), 14.
- Arora, D., Jindal, N., Shukla, R. K., & Bansal, R. (2013). Water borne hepatitis a and hepatitis e in malwa region of punjab, India. *Journal of clinical and diagnostic research: JCDR*, 7(10), 2163.
- Joon, A., Rao, P., Shenoy, S. M., & Baliga, S. (2015). Prevalence of Hepatitis A virus (HAV) and Hepatitis E virus (HEV) in the patients presenting with acute viral hepatitis. *Indian journal of medical microbiology*, 33(5), 102.
- Ren, X., Wu, P., Wang, L., Geng, M., Zeng, L., Zhang, J., ... & Yu, H. (2017). Changing epidemiology of hepatitis A and hepatitis E viruses in China, 1990–2014. *Emerging infectious diseases*, 23(2), 276.
- Joon, A., Rao, P., Shenoy, S. M., & Baliga, S. (2015). Prevalence of Hepatitis A virus (HAV) and Hepatitis E virus (HEV) in the patients presenting with acute viral hepatitis. *Indian journal of medical microbiology*, 33(5), 102.
- Al-Naaimi, A. S., Turkey, A. M., Khaleel, H. A., Jalil, R. W., Mekhleef, O. A., Kareem, S. A., ... & Dhadain, A. A. (2012). Predicting acute viral hepatitis serum markers (A and E) in patients with suspected acute viral hepatitis attending primary health care centers in Baghdad: a one year cross-sectional study. *Global journal of health science*, 4(5), 172.
- Kamal, S. M., Mahmoud, S., Hafez, T., & EL-Fouly, R. (2010). Viral hepatitis A to E in South mediterranean countries. *Mediterranean journal of hematology and infectious diseases*, 2(1).