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Original Research Article

Retrospective Study of Prevalence of Hepatitis-E Infection in Clinically Suspected Case of Acute Viral Hepatitis Patients Attending a Tertiary Care Hospital, Jamnagar, Gujarat

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Abstract

Background: Hepatitis E is an important public-health concern as a major cause of enterically transmitted hepatitis worldwide, spread primarily by faecal contaminated drinking water and is responsible for over 50% of cases of acute viral hepatitis in endemic countries. ***Aims & Objectives:*** To determine incidence of hepatitis E in jaundice patients admitted to the Tertiary care hospital, Jamnagar. 1) To assess Prevalence of Hepatitis E in various Socio-economic strata. 2) To determine various age and sex specific prevalence of Hepatitis E. ***Material & Methods:*** Total 377 blood samples of patient suspected of acute viral hepatitis were collected and tested for anti HEV IgM antibody by ELISA method (RecombiLISA). ***Observation and Result:*** Out of 377 patients, 48 patients (12.8%) showed anti HEV IgM antibodies. The anti HEV IgM antibodies were more in the 14-40 years (87.5%). Hepatitis E virus IgM antibodies positivity rate was more common in Males compare to females. ***Conclusion:*** HEV infection is maximum in young adults (14-40 years) than in pediatric and old age groups. Males (79%) are more seen to be infected with HEV than females (21%). In this present study there is no evidence of HEV in children's. Prevalence of HEV cases is mostly found in area of contamination of water.

Keywords: Hepatitis E virus, prevalence, Epidemiology, RecombiLISA.

INTRODUCTION

Hepatitis E virus (HEV), a non enveloped, positive sense, singlestranded RNA virus, is recognized as the principal cause of enterically transmitted non-A, non-B hepatitis, which occurs worldwide although [1] rarely in industrialized countries. Evidence of hepatitis E virus [2] (HEV) was first reported in 1955, in Delhi, India. Hepatitis E is a disease caused by a RNA virus that is classified as a member of the Hepeviridae family. There are 4 strains of HEV [1-4]. HEV is usually transmitted by the fecal-oral route, most frequently via sewage contamination of drinking water or food. The incubaton period ranges [3] from 2 weeks to 2 months, usually 1 month to 45 days. The virus is also associated with poor sanitary conditions and low socioeconomic status. HEV causes an acute hepatitis that is generally self-limited, rarely fulminant hepatitis may occur in 1-2% of cases; except for the pregnant women who are particularly at higher risk (20%). Young adult (14-40 year age) is commonly affected in HEV and fewer cases are seen in children. Person to person or secondary transmission is inefficient [4]. There is no chronic infection or carrier state. There is no specific treatment for HEV. In India, HEV infection is responsible for (5)30-70% of the case of acute and sporadic hepatitis. Since 1976 there [6, 7, 1] were seven outbreaks of hepatitis E reported from Ahmedabad city. Etiology of acute viral hepatitis (AVH) cannot be differentiated on the basis of mode of presentation; confirmation is done serologically. HEV [8] is an important hepatotropic virus that causes acute viral hepatitis. Recognition of early warning signals, timely investigation and application of specific control measures can limit the spread of the outbreak and prevent deaths. Recommendations based on the outbreak [9] investigation also prevent future outbreaks.

Objectives

Hepatitis E is one of most common infections during adulthood, transmitted by faeco-oral route. This study was performed to detect the profile of Hepatitis E virus in clinically suspected case of Acute Viral Hepatitis attending tertiary care Hospital for past 11 Months (January-2018 to November-2018).

MATERIALS & METHODS

Study Population

Patients attending Outpatient department or admitted in G.G.G. Hospital, Jamnagar with jaundice or signs and symptoms suggestive of acute viral hepatitis were included in the study.

Case Definition and Criteria of Inclusion

Patients with one or more of the following characteristics were included in the study: Acute clinical illness that includes malaise, extreme fatigue, fever, anorexia, vomiting combined with right upper quadrant pain and dark urine.

Study Sample

11 months study period extending From January 2018 to November 2018 were included in the study.

Sample Collection and Storage:

From January 2018 to November 2018, blood samples were collected from 377 Patients suspected of acute viral hepatitis in our institute. Blood samples were collected from all the patients. After separate the serum it stored at 2-8◦C. All 377 of serum samples were tested for anti HEV IgM antibody using commercially available ELISA method (Recombilisa).

Detection of IgM Antibodies to Hepatitis E Virus by ELISA (RecombiLISA)

Samples were screened for Hepatitis E IgM antibody by Recombilisa ELISA (Enzyme Linked Immuno Sorbent Assay). HEV IgM Elisa kit is a solid phase enzyme linked immunoabsorbentassay based on the principle of the IgM capture techniqe for the detection of IgM anti-HEV in human serum or plasma. The HEV IgM ELISA kit has two components: (1) Solid microwells pre-coated with polyclonal anti human IgM antibody. (2)Liquid conjugates composed of HEV antigens conjugated with horse reddish peroxidase (HRP-HEV conjugates).

During the assay, the test specimen is first incubated with the coated microwells. IgM anti-HEV, if present in the specimen, binds to the antibody coated on the microwell surface. In the second incubation with the HRP-HEV conjugates, the IgM anti-HEV antibody absorbed on the surface of microwell reacts to the HRP-HEV conjugates, forming a complexed conjugates. Unbounded conjugates are then removed by washing. The presence of the complexed conjugates is shown by a blue colour upon additional incubation with TMB substrate. The reaction is stopped with stop solution & absorbance are read using a spectrophotometer at 450/620-690 nm using ELISA reader method.

(Cut off: Average NC+0.15) A cut-off value let optical densities be interpreted into anti-HEV IgM negative (If the OD ratio of the sample <1.00) and positive (If Specimen OD ratio ≥1.00) results. The diagnostic sensitivity and specificity were 100% found.

RESULTS

In present study out of total 377 samples, 48 were positive for HEV each tested for anti HEV IgM antibody to know the recent infection of HEV. So, seroprevalence of HEV was 12.8%.

Table-1: Seroprevalence of HEV

Total	Positive	Seroprevalence
377	48	12.8%

Table-2: Gender wise distribution of confirmed case of HEV IgM

Gender	Total tested	Positive
Male	268	38
Female	109	10
Total	377	48

Table-3: Age and Sex wise distribution of confirmed case of HEV IgM

Age (year)	Male	Female	Total
0-13	0	0	0
14-40	32	10	42
>40	6	0	6
Total	38	10	48

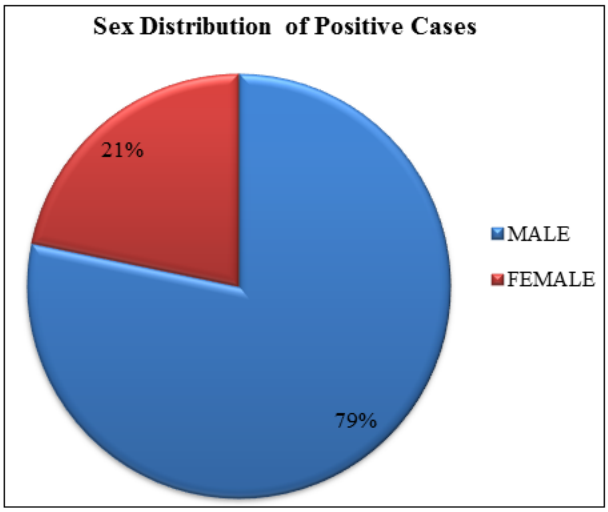

Fig-1: Sex Distribution of Positive Cases

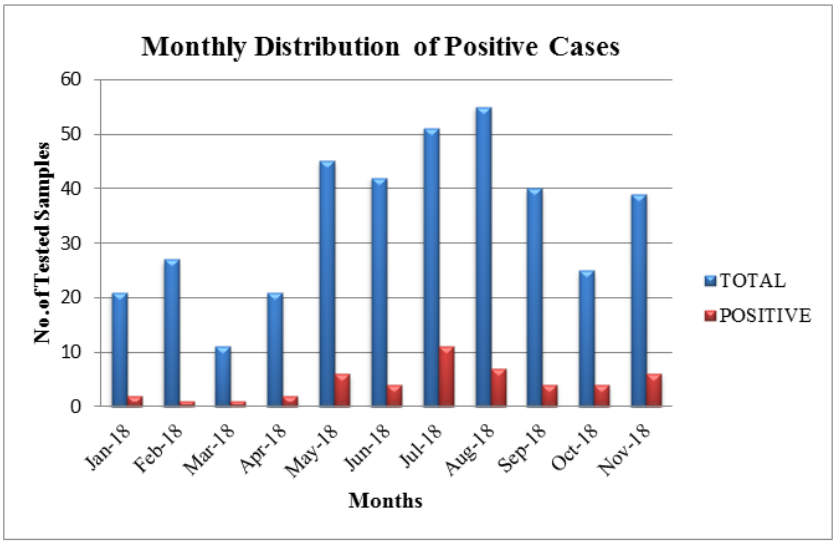

Fig-2: Monthly Distribution of Positive Cases

DISCUSSION

Viral hepatitis continues to be major public health problem in India and other developing countries. Ever since the first major epidemic of HEV that occurred in 1955 at Delhi(10), where 30,000 people were affected due to sewage contamination of city's drinking water supply following a flood that occurred in Yamuna river.

Study	Sero-prevalence	14-40 year	>40 year	Male	Female
Raval DA *et al*., [11]	27.2%	82.48%	17.52%	69.35%	30.65%
Pushpa K *et al*., [12]	29.33%	87.87%	12.13%	77.27%	22.37%
Chauhan N. T *et al*., [13]	10.9%	78.97%	21.04%	64.80%	35.20%
Sarwat *et al*., [14]	7.4%	-	-	68.5%	31.5%
Present study	12.2%	87.5%	12.5%	79.1%	20.9%

Patients of ≥14 years showed more number of cases compared to <14 years of age in this study. Prevalence rate of present study are comparable with the study done by Chauhan NT *et al.*, [13] which is higher than Sarwat *et al*., [14] while lower than Raval D. A *et al.*, [11] and Pushpa K. *et al.*, [12].

The age distribution of HEV cases in this study was similar to previously other studies Raval DA *et al*., [11], Pushpa K *et al*., [12] and Chauhan NT *et al.*, [13].

Man had higher attack rates than women, attack young adults (14-40year) showed high attack rates compared with Raval DA *et al*., [11], Pushpa K *et al*., [12] and Chauhan N. T *et al*., [13]. It is still not known why men are at greater risk and children spared. These could be possibly due to very poor sanitary &

hygienic conditions, leakages in drinking water pipelines and overflowing drains. In a resource-limiting setting, particularly when urban areas grow rapidly, provision for sewage and protected water supply is often neglected, with serious consequences for public health.

CONCLUSION

Study confirms that, HEV most commonly cause Acute Viral Hepatitis in (14-40) year followed by >40 year. In this present study there is no evidence of HEV in children. HEV is more common in male compare to female. Prevalence of HEV cases is mostly found in area of contamination of water. For this, recommendations. A temporary alternative water supply, repair of the leakages, and water quality surveillance. RO system alone does not provide protection from viruses, so RO system with hollow fiber membrane technology should be used as it prevents the transmission of HEV. However, chlorination in routine does not kill viruses, however it protects from other bacterial conditions. Quality of the drinking water for fecal contamination should be periodically checked. The recognisation of early warning signals, timely investigation, proper monitoring, and application of specific control measures with sanitation can control disease and decreased morbidity and mortality.

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