PREVALENCE OF HEPATITIS E IN CLINICALLY SUSPECTED CASE OF ACUTE VIRAL HEPATITIS IN JAMNAGAR, INDIA.

Microbiology

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ABSTRACT

OBJECTIVE: Hepatitis E is one of most common infections during adulthood. This study was performed to detect the profile of Hepatitis E virus in clinically suspected case of Acute Viral Hepatitis attending GGG Hospital, Jamnagar, Gujarat.

MATERIAL & METHODS: Study was conducted in our institute from July-2016 to June-2017, blood samples of patients suspected of Acute Viral Hepatitis were tested for anti HEV IgM antibody by ELISA Method.

RESULT: Out of 225 samples, total 66(29.33%) adult were Positive for anti HEV IgM Antibody among this: 58 (87.87%) were 14-40 year of age and only 8 (12.13%) were >40 year of age.

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's. Prevalence of HEV cases is mostly found in area of contamination of water.

KEYWORDS

HEV; Seroprevalence; Age; Sex

INTRODUCTION:

Hepatitis E virus (HEV), a non enveloped, positive sense, single-stranded RNA virus, is recognized as the principal cause of enterically transmitted non-A, non-B hepatitis, which occurs worldwide although rarely in industrialized countries. [1] Evidence of hepatitis E virus (HEV) was first reported in 1955, in Delhi, India. [2] 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, 2, 3, 4). HEV is usually transmitted by the fecal-oral route, most frequently via sewage contamination of drinking water or food.The incubaton period ranges from 2 weeks to 2 months, usually 1 month to 45 days. [3] 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 30-70% of the case of acute and sporadic hepatitis. [5] Since 1976 there were seven outbreaks of hepatitis E reported from Ahmedabad city. [6,7,1]

Etiology of acute viral hepatitis (AVH) cannot be differentiated on the basis of mode of presentation; confirmation is done serologically. HEV is an important hepatotropic virus that causes acute viral hepatitis. [8] 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 investigation also prevent future outbreaks. [9]

OBJECTIVE:

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 GGG Hospital, Jamnagar, Gujarat for past 1 year (JULY-2016 to JUNE-2017).

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:

All eligible subjects recorded during the 12 months study period extending from From July 2016 to June 2017 were included in the study.

Sample Collection and Storage:

From July 2016 to June 2017, blood samples were collected from 225 patients suspected of acute viral hepatitis in our institute. Blood samples were collected from all the patients after taking the informed consent. Centrifugation was performed at 1500 rpm for 10 minutes to separate the serum. Then they stored at 2-8◦C. All 225 of serum samples were tested for anti HEV IgM antibody using commercially available ELISA method (DIA-PRO).

Detection of IgM Antibodies to Hepatitis E Virus by ELISA

Samples were screened for Hepatitis E IgM antibody by DIA-PRO ELISA (Enzyme Linked Immuno Sorbent Assay). Microplates are coated with HEV-specific recombinant antigens encoding for conservative and immunodominant determinants of all the 4 subtypes. The solid phase is first treated with the diluted sample and anti HEV IgM is captured, if present, by the antigens. After washing out all the other components of the sample, in the 2nd incubation bound anti-HEV IgM are detected by the addition of polyclonal specific anti hIgM antibodies, labelled with peroxidise (HRP). The enzyme captured on the solid phase, acting on the substrate/chromogen mixture, generates an optical signal that is proportional to the amount of anti HEV IgM present in the sample. A cut-off value let optical densities be interpreted into anti-HEV IgM negative and positive results. Optical density was measured at 450nm using ELISA reader method. The diagnostic sensitivity and specificity were 100% found.

RESULT:

In our study out of total 225 samples, 66 were positive for HEV each tested for anti HEV IgM antibody to know the recent infection of HEV. So, sero prevalence of HEV was 29.33%.

Table-1: Seroprevalence of HEV

Total	Positive	Seroprevalence
225	66	29.33%

All the positive cases were above 14 years of age.

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

Gender	Tested	Positive
Male	150	51 (77.27%)
Female	75	15 (22.73%)
Total	225	66

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

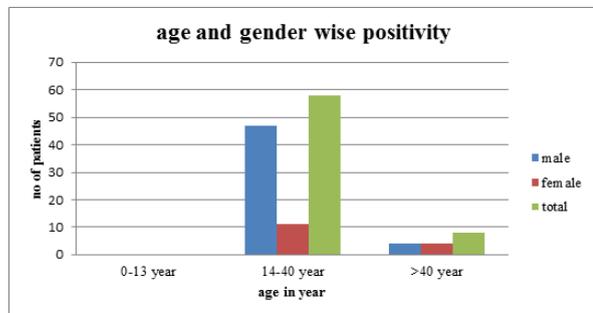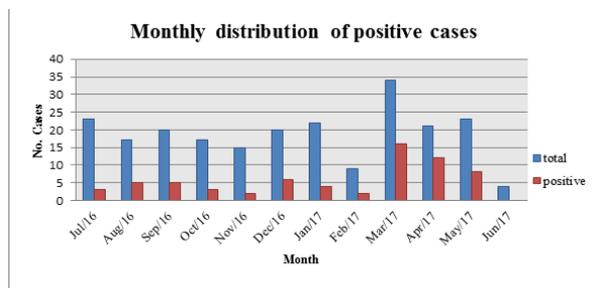| Age (In Years)	Tested	Positive
1-13	0	0
14-40	183	58 (87.87%)
>40	42	8 (12.13%)
Total	225	66

Fig-1: Age and Gender wise positivity

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.

Table-4: Prevalence of HEV in clinically suspected cases of acute viral hepatitis

Study	Seroprevalence	14-40 year	>40 year	Male	Female
Verma PB et al (11)	28.21%	67.39%	32.61%	83.7%	16.3%
Chauhan NT et al (12)	10.9%	78.97%	21.04%	64.80%	35.20%
Raval DA et al (13)	27.2%	82.48%	17.52%	69.35%	30.65%
Present study	29.33%	87.87%	12.13%	77.27%	22.37%

Pateints of ≥14 years showed more number of cases compared to <14 years of age in this study. The age distribution of HEV cases in this study was similar to previously other studies. [11,12,13] Our findings are comparable with the studies done by Nail et al and Tesga et al reported that men had higher attack rates than women, attack young adults showed high attack rates. [2,14] 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. [15]

CONCLUSION & SUMMARY:

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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