

A Hospital-Based Survey of Distribution of Hepatitis a in Clinically Suspected Cases of Acute Viral Hepatitis: An Observational StudyAradhana Bharati¹, Samir Alam², Archana³, Vijay kumar⁴¹Tutor, Department of Microbiology, Patna Medical College and Hospital, Patna, Bihar, India²Tutor, Department of Microbiology, Patna Medical College and Hospital, Patna, Bihar, India³Tutor, Department of Microbiology, Patna Medical College and Hospital, Patna, Bihar, India⁴Professor and HOD, Department of Microbiology, Patna Medical College and Hospital, Patna, Bihar, India

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Conflict of interest: Nil

Abstract**Aim:** The aim of the present study was to assess the seroprevalence of Hepatitis A cases and profile of clinically suspected cases of acute viral hepatitis at a tertiary hospital.**Methods:** The present study was prospective and observational study conducted in the Department of Microbiology, PMCH, Patna, Bihar, India for the period of one year. In present study, serum of 200 cases of suspected hepatitis was tested.**Results:** Suspected hepatitis cases were most commonly observed in 15 – 30 years of age group (45%) followed by 31 to 45 years of age group (30%) and less than 15 years (18%). Suspected hepatitis cases were most commonly observed in female (53%) population as compared to male (47%). The most common clinical features amongst cases of hepatitis was fever (98%) followed by malaise (97%), abdominal pain (88%), Yellow discoloration of urine (24%) and loss of appetite (14%). Anti HAV test (IgM) was reactive most commonly in less than 15 years of age group followed by 15 to 30 years and 31-45 years. Amongst HAV positive cases there was slightly higher number of female cases as compared to male cases. Mean Total Bilirubin, SGOT/AST, SGPT, ALP and A/G ratio amongst hepatitis A cases was 2.86 ± 2.46 , 113 ± 28.73 , 308 ± 152 , 1365 ± 596 and 0.68 ± 0.24 respectively.**Conclusion:** HAV infections are prevalent infections among clinically suspected acute viral hepatitis patients and remain a major health problem in developing countries. Reduced incidence of HAV infection in respective age group indicates the role of improved sanitary measures and public education.**Keywords:** Hepatitis A virus, acute viral hepatitis, HAV seroprevalence, anti-HAV antibodies

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Introduction

Hepatitis A (HAV) and hepatitis E (HEV) viruses are important public health problems in developing countries such as India. [1] Both these viruses are predominantly enterically transmitted through feco-oral route and cause a spectrum of infection ranging from asymptomatic infection, usually in children, to acute viral hepatitis (AVH) of varying severity in adults. [2]

Hepatitis A is a vaccine-preventable disease but the vaccine has not been deployed in India [3] as more than 80% of children by the age of 10 years develop antibodies as a result of natural infection [4] and since the disease is often clinically insignificant in this age group, the use of vaccine is not justified and is still a subject of debate. It is pertinent to note that more than half of the world's

population practicing defecation in the open is residing in India. [5] However, there is a noticeable shift in the disease spectrum from children to adults as a result of improvement in the socio-economic conditions. [6] To add to this, there has been an emphasis on the promotion of increased sanitary infrastructure by India under the Swachh Bharat (Clean India) mission since 2014. [7]

HEV on the other hand is known to cause infection in adult population as compared to children [8] with a greater predilection to cause outbreaks in the community as compared to HAV. [9] It is also documented to cause severe disease in pregnant females leading to increased mortality and pregnancy-related complications. [10] There is evidence in the literature regarding this virus still

being a public health menace in industrialized countries as well. [11,12]

Acute viral hepatitis is a systemic infection affecting the liver predominantly. ICMR-National Institute of Virology (NIV), Pune, received two batches of water samples from Shimla in January 2016 to test for the presence of enterically transmitted hepatitis viruses. Subsequently, 57 icterus patients were tested for various markers of hepatotropic viruses, i.e. anti-HEV IgM/IgG, anti-hepatitis A virus (anti-HAV) IgM/IgG antibodies and HEV RNA. [13] The National Viral Hepatitis Control Program (NVHCP), launched in July 2018, intends to address the public health problem caused by these viruses and it aims to substantially reduce the risk, morbidity, and mortality associated with HAV and HEV by 2030. [14]

The aim of the present study was to assess the seroprevalence of Hepatitis A cases and profile of clinically suspected cases of acute viral hepatitis at a tertiary hospital.

Materials and Methods

The present study was prospective and observational study conducted in the Department of Microbiology, PMCH, Patna, Bihar, India for the period of one year. In present study, serum of 200 cases of suspected hepatitis was tested.

Inclusion criteria: All patients with clinically suspected acute viral hepatitis, clinically suspected acute liver disease patients attending OPD and who

were admitted in the wards, serum tested for anti HAV, willing to participate in the study.

Exclusion criteria: Patients of chronic viral hepatitis. Patients not willing to be part of the study.

A detailed history was elicited for each patient and duly recorded in the case record form. Liver function test results of study patients 5ml of blood was collected in a sterile vacutainer from after taking informed consent. Serum was separated after centrifugation at 2500 rpm for

15 minutes and subjected for serological testing. RecombiLISA test was used for detection of IgM anti- HAV in human serum or plasma.

1. The negative result indicates that there is no detectable IgM anti HAV in the specimen.
2. Results just below the cut-off value were retested in duplicate the corresponding specimens.
3. Specimens with cut-off > 1.00 are initially considered to be positive by the HAV ELISA Kit and were retested in duplicate before final interpretation.

Data was collected and compiled using Microsoft Excel, analysed using SPSS 23.0 version. Difference of proportions between qualitative variables was tested using chi- square test or Fisher exact test as applicable. P value less than 0.5 was considered as statistically significant.

Results

Table 1: Age and Gender wise distribution of cases

| Age groups in years | N | % |
|---------------------|---------------|----|
| <15 yrs. | 36 | 18 |
| 15-30 yrs. | 90 | 45 |
| 31-45 yrs. | 60 | 30 |
| 46-60 yrs. | 12 | 6 |
| >60 yrs. | 2 | 1 |
| Mean age | 27.93 ± 12.15 | |
| Gender | | |
| Male | 94 | 47 |
| Female | 106 | 53 |

Suspected hepatitis cases were most commonly observed in 15 – 30 years of age group (45%) followed by 31 to 45 years of age group (30%) and less than 15 years (18%). Suspected hepatitis cases were most commonly observed in female (53%) population as compared to male (47%).

Table 2: Clinical profile of patients

| Clinical profile | N | % |
|-------------------------------|-----|----|
| Fever | 196 | 98 |
| Malaise | 194 | 97 |
| Abdominal pain | 176 | 88 |
| Yellow discoloration of urine | 48 | 24 |
| Loss of appetite | 28 | 14 |
| Icterus | 34 | 17 |
| Hepatomegaly | 16 | 8 |

The most common clinical features amongst cases of hepatitis was fever (98%) followed by malaise (97%), abdominal pain (88%), Yellow discoloration of urine (24%) and loss of appetite (14%).

Table 3: Seroprevalence of Hepatitis A virus in clinically suspected cases in relation to age

| Age groups in years | Anti HAV test (IgM) | | Total |
|---------------------|---------------------|--------------------|-------|
| | Reactive cases | Non-reactive cases | |
| <15 yrs. | 8 | 28 | 36 |
| 15-30 yrs. | 1 | 89 | 90 |
| 31-45 yrs. | 1 | 59 | 60 |
| 46-60 yrs. | 0 | 12 | 12 |
| >60 yrs. | 0 | 2 | 2 |
| Total | 10 | 190 | 200 |
| Gender | | | |
| Male | 4 | 92 | 96 |
| Female | 6 | 98 | 104 |
| Total | 10 | 190 | 200 |

Anti HAV test (IgM) was reactive most commonly in less than 15 years of age group followed by 15 to 30 years and 31-45 years. Amongst HAV positive cases there was slightly higher number of female cases as compared to male cases.

Table 4: LFT of hepatitis A

| HAV | Mean | SD |
|--------------------|---------|-------|
| Total Bilirubin | 2.86 | 2.46 |
| Direct Bilirubin | 1.88 | 1.54 |
| Indirect Bilirubin | 1.26 | 1.06 |
| SGOT/AST | 113.00 | 28.73 |
| SGPT | 308.00 | 152 |
| ALP | 1365.00 | 596 |
| Serum Albumin | 2.98 | 0.37 |
| Serum Globulin | 3.54 | 0.54 |
| A/G ratio | 0.68 | 0.24 |

Mean Total Bilirubin, SGOT/AST, SGPT, ALP and A/G ratio amongst hepatitis A cases was 2.86 ± 2.46 , 113 ± 28.73 , 308 ± 152 , 1365 ± 596 and 0.68 ± 0.24 respectively.

Discussion

Acute viral Hepatitis can be self-limiting or can progress to fibrosis, cirrhosis or liver cancer. The term "Viral Hepatitis" refers to a primary infection of the liver by any one of the heterogenous group of "hepatitis viruses", which consists of types A, B, C, D, E and G. The features common to them are their hepatotropism and ability to cause a similar icteric illness, ranging in severity from the unapparent to the fulminant fatal forms. [15,16] Hepatitis A Virus (HAV) are small non-enveloped single stranded RNA viruses, belongs to genus Hepatovirus of family Picornaviridae. Approximately 1.4 million cases are reported every year throughout the world. [17]

Suspected hepatitis cases were most commonly observed in 15 – 30 years of age group (45%) followed by 31 to 45 years of age group (30%) and less than 15 years (18%). Suspected hepatitis cases were most commonly observed in female (53%)

population as compared to male (47%). The study conducted by Sharma P.K et al [18] shows maximum number of cases i.e. 52.22% in the age group of 15-35 years with mean age of $37.4 + 15.9$ yrs. Also Antony J et al [19] shows 54.64% and 29.82% in the age group of 20-39 years and <19 years. The most common clinical features amongst cases of hepatitis was fever (98%) followed by malaise (97%), abdominal pain (88%), Yellow discoloration of urine (24%) and loss of appetite (14%). Similar findings were noted in other studies. [20-23]

Anti HAV test (IgM) was reactive most commonly in less than 15 years of age group followed by 15 to 30 years and 31-45 years. Amongst HAV positive cases there was slightly higher number of female cases as compared to male cases. While Tewari R et al²⁴ observed maximum in 5- 15 years of age group. Likewise, Pandya N et al [25] noted highest seroprevalence in the age group 0-5 years (44.11%) followed by 6-10 years (26.47%). Studies conducted by Agrawal M et al [26], Singh MP et al [27], Sarwat F et al [28] showed maximum seropositivity in <15 years of age group. The high prevalence rate in children in developing countries

is attributed to their susceptibilities to infection due to poor hygiene, overcrowding and poor sanitary conditions, where there is abundant shedding of HAV in the faeces contributing to high endemicity pattern. [16] Mean Total Bilirubin, SGOT/AST, SGPT, ALP and A/G ratio amongst hepatitis A cases was 2.86 ± 2.46 , 113 ± 28.73 , 308 ± 152 , 1365 ± 596 and 0.68 ± 0.24 respectively.

Conclusion

HAV infections are prevalent infections among clinically suspected acute viral hepatitis patients and remain a major health problem in developing countries. Reduced incidence of HAV infection in respective age group indicates the role of improved sanitary measures and public education.

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