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Original Research Article

Prevalence of Hepatitis C Virus (HCV) infection among jaundiced children

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ABSTRACT

Background: Viral hepatitis continues to be major public health problem in both developing and developed countries. Acute hepatitis C virus (HCV) infection tends to be mild and insidious in onset, with long term health and economic implications. The aim of the study was to determine prevalence of HC virus infection in hospitalized jaundiced children of Kashmir.
Methods: This hospital based prospective study was conducted in the department of pediatric Govt Medical Collage Srinagar over a period of 1year from October 2007 to September 2008. A total of 100 patients were included in this study. Oral questionnaire pertaining to various aspects of HCV virus infection was administered and serum sample of all patients were analyzed for anti-hepatitis C virus antibody by ELISA method using Zhongshan HCV ELISA kit china. Diagnosis was confirmed in positive cases by PCR for HCV RNA.
Results: Only two patients out of 100 patients were positive for hepatitis C virus antibody, both patients were admitted as chronic liver disease (CLD), one being 15 years old male and other 9 years old female. Seventy-four patients were positive for Hepatitis A, IgM antibody, out of which 8 patients had fulminant hepatic failure and one patient was HBsAg positive.
Conclusions: This study highlights the daunting prevalence of HCV infection in our setup and implicates necessity for raising the awareness and screening of HCV-high risk individuals to decrease mortality and morbidity associated with Hepatitis C virus infection.

Keywords: Hepatitis C, Infection, Prevalence

INTRODUCTION

Worldwide more than 130 million people are chronically infected by hepatotropic Hepatitis C virus (HCV). Only small proportion of the HCV infected individuals are children.[1] The prevalence of HCV infection increases with age in the general population and is lower among adolescents (0.4%) than adults (2.5%). It is estimated that seroprevalence of anti-HCV is 0.25% in children younger than 12 years of ages and 0.4% in those between 12-19 years.[2] The seroprevalence of HCV in hospital-based studies from Mauritius, Ethiopia and South India is 5.9%,6% and4.8% respectively.[3]

Most routes of transmission include unsafe injection practices, inadequate sterilization of medical equipments

and the transfusion of unscreened blood and blood products. Less common routes include sexual transmission and mother to child transmission.[4] May 2016 the World Health Assembly set a goal to eliminate HCV infection as a public health concern by reducing 90% and 65% incidence and mortality rates respectively due to viral hepatitis by 2030.[4] Country-wise strategies should be implemented to resonate with the World health Assembly goals which needs as such robust and qualitative epidemiological data.

The clinically available assay for detection of Hepatitis C infection are based on detection of antibodies to hepatitis C virus antigens or detection of viral RNA. The most widely used serological tests are the three generations of enzyme immune assays (EIA) to detect anti-HCV. The virological assay for hepatitis C virus are the polymerase chain reaction and branched chain DNA (bDNA test). The presence of hepatitis C virus associated liver disease is indicated by elevated serum alanine transaminase level and confirmed by histological examination of liver biopsy.[5-7]

Keeping in view socioeconomic and logistic requirements, community based seroprevalence are difficult to conduct in our settings. So being our centrally placed hospital as the largest medical facility for whole pediatric population of our Kashmir valley we took up this study to know the seroprevalence of hepatitis C virus infection.

METHODS

This hospital based prospective study was conducted over a period of 1 year from Oct. 2007 to Sep. 2008 in the department of Pediatrics Govt. Medical College Srinagar in collaboration with department of transfusion medicine of same college. Ethical clearance from the Ethical Committee was sought before study. The participants included all hospitalised jaundiced (both biochemical or clinical) patients of either sex of age 1-18 years. Infants were excluded from the study.

After taking written consents from patients/parents/legal guardians, all patients were administered oral questionnaire containing information regarding parameters like demographic characteristics, type of health care provider, injection practices, numbers of injections in past 6-12 months, any history of surgical procedures especially circumcision in males, h/o of blood or blood product transfusion, and h/o IV drug abuse among sibling or family member, h/o of tattooing or ear piercing in child and history of jaundice or diagnosis of HCV in other family members in the same house.

After administration of questionnaire, one milliliter of blood was obtained from all participants and assayed for qualitative determination of anti-hepatitis C virus antibody by ELISA method using Zhongshan HCV ELISA kit China having 99.8% sensitivity and 98.9% specificity. The prevalence of hepatitis C was calculated as: Total number of old and new cases of documented HCV infection/ Total number of cases studied × 100. The diagnosis in positive cases was confirmed by PCR for HCV RNA.

RESULTS

In this study males comprised 51% (n=51) of patients with mean age of 7.1± 4.1 while as females comprised of 49% (n=49) with mean age of 6.1±2.6. Clinical and biochemical details are given in Tables 1 to 4. Present study shows that commonest risk factor was unsafe circumcision/dental procedures as is shown in Table 1.

Table 1: Risk factors among the studied patients.

Risk factor	Present	Absent
Blood/blood product transfusions	6	94
Safe injections	32	68
Tattooing	0	100
I/V drugs in child/family/sibling	0	0
Jaundice/HCV infection in other family members	0	0
Unsafe circumcisions/dental procedures	35.3	64.7
Ear piercing	0	0

This was followed by injections and blood and blood transfusion products. However, it is worthwhile to note that ear piercing despite being common did not pose as a risk in our population. Safe injection practices are observed just above 1/3rd of cases.

Table 2: Liver functions among the studied children.

Parameter	Minimum	Maximum	Mean	SD
Bilirubin	1.4	9	2.9	1.4
Protein	2.5	6	4.5	0.6
SGOT	30	1500	230	243.1
SGPT	30	1200	201	201.1
ALP	350	1297	688	271.4
PT	12	17	13.4	0.9

Table 3: Hepatotropic virus distribution among the studied children.

Parameter	Male	Female	Total	%	P value
Hepatitis A	37	37	74	74	0.717 (NS)
Hepatitis B	0	1	1	1	
Hepatitis C	1	1	2	2	

Among the studied jaundiced patients, mean serum bilirubin, SGOT, SGPT, and PT remained at 2.9 mg/dL, 230IU/L, 200IU/L, and 13.4 sec as shown in Table 2. From Table 2, maximum bilirubin level did not cross 9 mg/dL, despite many cases were having fulminant

hepatitis. It is noteworthy that mean PT hovered around normal value.

From the results of the present study commonest type of viral infection to liver was Hepatitis A Virus (74%), followed by hepatitis C (2%) and Hepatitis B (1%) respectively as is depicted in Table 3.

Table 4: Differential diagnosis other than viral hepatitis among 23 studied.

Diagonosis	Male	Female	Total	%
Chronic liver disease	6	7	13	13
Herbal drug induced hepatitis	1	1	2	2
Hemolytic anaemia	0	1	1	1
Post viral myelosuppression	1	1	2	2
Fanconi's anaemia	2	0	2	2
Infectious mononucleosis	2	0	2	2
Valproic acid induced hepatitis	1	0	1	1

It is quite interesting to note that all the fulminant hepatitis cases were of hepatitis A, and both the cases of hepatitis C were chronic liver disease patients. This is sufficient to believe that hepatitis C infection running an indolent course do have a high chance of missing if active awareness about this disease is not carried out.

It has come to surface from our observation that a good chunk of jaundiced patients (23%) were non-viral in origin, as is shown in Table 4. Other non-viral conditions were herbal drugs, post viral illness, Fanconi, and Infection mononucleosis accounting 2% each. One case was valproic acid induced jaundice and other was haemolytic anaemia induced jaundice.

DISCUSSION

The seroprevalence of hepatitis C virus infection was 2% in the present study. There was no significant difference in age or sex distribution. The prevalence in the present study was very low compared to similar hospital based study done by Khan et al (seroprevalence of 9% among 700 patients with mean age of 32.16 years vs 2% in our study of 100 patients of mean age varying from 6.1 to 7.1 years in females and males respectively).[3] These differences are mainly because of narrower age group, smaller sample size and possibly cultural factors and social habits.

The prevalence in the present study was comparable but higher than the studies conducted by Faleh AL et al (seroprevalence of 0.9% among 4496 children's age between 1-10 years), Wasimjafri et al (seroprevalence of 1.6% among 3533 children's age between 1-15 years) and Lee WS et al (serprevalence of 0.6% among 179 children's between age 1-16 years).[8,9] This can be explained by the fact that we have included only jaundiced patients.

The seroprevalence of anti HCV antibody among studied subjects with previous h/o blood transfusions in this study was 16.6% comparable to study done by Hazra et al who reported in his cross-sectional study that blood transfusions received before 1995, blood transfusions received in early 1995 and no history of blood transfusions received had a seroprevalence of 16%, 6% and 2% respectively.[10]

Out of 100 participants in our study, 15 had chronic liver disease out of whom two were positive for hepatitis C antibody with a prevalence of 13.3 in them. This was comparable to Amara-Purakar et al who reported in his study of prevalence of anti HCV antibody in patients of CLD in Bombay between 15-20%.[11]

CONCLUSION

Due to daunting prevalence of HCV infection with long term implications, high risk screening supplemented with increasing awareness regarding the modes of transmission and treatment of HCV infection among the general masses in particular to pediatric population will bring positive changes in curbing this menace.

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