



Seroprevalence of Hepatitis B And Hepatitis C Viral Infections In Central Kerala

KEYWORDS

Hepatitis B - Hepatitis C- prevalence - Central Kerala

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ABSTRACT *Background: Hepatitis B and C virus infections are increasingly becoming prevalent in India and are serious health problems worldwide. Objectives: We aim to find out the prevalence of these infections in a tertiary care hospital in Central Kerala over a period of one year. Materials and methods: The study group comprised of voluntary blood donors, and patients from various clinical departments including routine pre-operative and antenatal cases. A total of 6391 and 4153 samples were processed for Hepatitis B surface antigen (HBsAg) and anti HCV antibodies respectively. Serum samples were subjected to HBsAg and Hepatitis C antibody detection using card tests, ELISA and Enzyme linked fluorescent assay (ELFA). Results: Of the total samples processed, 13 were found to be positive for HBsAg (0.2%). All the positive HBsAg cases were from male population and the mean age of positivity was found to be 37years. Out of 4153 samples 4 were positive for HCV antibody (0.09%). Conclusion: There is a need for large field studies to better understand HBV & HCV epidemiology and to identify high prevalence areas, and public health measures to be taken to prevent disease transmission and decrease the burden of the disease.*

Introduction

Hepatitis viruses B (HBV) and C (HCV), which are being transmitted predominantly through the parenteral route, pose a serious "silent epidemic" challenge to India. They are highly infectious especially Hepatitis B, which is 100 times more infectious than HIV [1]. It has been estimated that India has around 40 million HBV carriers, second only to China. There are about 12.2 million HCV carriers in our country. The natural history of infection by HCV in the northern hemisphere indicates that 80% or more of infected individuals become chronic carriers. About 50% of chronic liver diseases (CLD) are due to HBV and 20% is due to HCV infection [2].

The blood-borne Viral Hepatitis; HBV and HCV infections are commonly caused by transfusion of infected blood/ blood products, transplantation, dialysis, unsafe injection practices, use of contaminated equipments and transmitted perinatally also. Other persons at risk are injecting drug users, healthcare workers caring for infected people and heterosexual & homosexual individuals especially in areas of low endemicity. Sexual route is less important for Hepatitis C compared to B. HCV infection is acquired most often through transfusion of blood or blood products and accounts for most of the post transfusion hepatitis cases in India [3].

Among the various serum markers of hepatitis B infection, HBsAg is the first to appear in serum following infection and the presence of which can be tested with different methods. The most useful method for detecting HBV antigens and antibodies is ELISA, in addition several rapid tests like immunochromatography are also available. Molecular methods like PCR used for detection of HBV DNA levels in serum reflect the degree of viral replication in

liver. Hepatitis C is a highly mutable virus exhibiting considerable genetic and antigenic diversity which limits the diagnostic value of antibody detection methods, which are the standard tests for diagnosis in HCV infection. In addition, the antibodies appear irregularly and late. To overcome this problem, enzyme immunoassay using monoclonal antibodies for the detection of the core antigen of HCV has been developed with the claim of sensitivities comparable to nucleic acid amplification systems. (XcytonTM, Bangalore, India) [2]. The RNA of HCV can be detected by highly sensitive test based on RT-PCR or other nucleic acid amplification techniques even in the window period.

Better knowledge of the prevalence and modes of transmission of a disease in a community only will help to control and prevent the infection. Community based seroprevalence studies on hepatitis are difficult to conduct in a developing country like India. Hence the true prevalence of the disease is difficult to assess except from hospital based studies.

Materials and methods

The study group comprised of voluntary blood donors, and patients from various clinical departments including routine pre-operative and antenatal cases from a tertiary care centre in central Kerala. A total of 6391 and 4153 samples were processed for HBsAg and anti HCV antibodies respectively, over a period of one year from Jan,2015 to Dec,2015. Serum samples were subjected to HBsAg detection using immunochromatographic card test, Hepaview (Tulip), ELISA and ELFA (VIDAS HBs Ag Ultra - BioMerieux, France). Hepatitis C antibody detection is done with card tests; Flaviscreen (Tulip), Tridot (J Mitra), ELISA(Erba - Transasia) and ELFA (VIDAS Anti -HCV - BioMerieux,

France).

Statistical methods: The prevalence of hepatitis viruses and their distribution among various age groups and sex were analysed by Fisher's exact test and Mann-Whitney U test. A 'p' value of < 0.05 was considered to be statistically significant.

Results:

Table 1: Age and Sex wise distribution of samples for HBsAg (excluding donors) and positivity (n=5191)

Characteristic	Categories	Number Screened (%)	HBsAg Positivity (%)
Age group(Years)	<12	194(3.7)	0(0.0)
	13-20	360(6.9)	0(0.0)
	21-40	1867(36.0)	6(50.0)
	41-60	1561(30.1)	6(50.0)
	>60	1209(23.3)	0(0.0)
Sex*	Male	2802(54.0)	12(100.0)
	Female	2389(46.0)	0(0.0)
Total		5191(100.0)	12(0.23)

* Sex distribution shows a 'p' value of 0.001 by Fisher's Exact test.

Table 2: Age distribution of HBsAg samples (excluding donors) (n=5191)

HbsAg Testing	Age(years)**		'p' value
	Mean	SD	
Reactive	37.42	12.09	0.257
Non-reactive	43.98	19.81	

** Age distribution shows a 'p' value of 0.257 by Mann-Whitney U test.

Table 3: Age and Sex wise distribution of samples for HCV (excluding donors) and positivity (n=2953)

Characteristic	Categories	Number Screened (%)	HCV Positivity (%)
Age group(Years)	<12	75(2.5)	0(0.0)
	13-20	170(5.8)	0(0.0)
	21-40	975(33.0)	1(33.3)
	41-60	984.(33.3)	2(66.6)
	>60	749(25.4)	0(0.0)
Sex	Male	1672(56.6)	2(66.6)
	Female	1281(43.4)	1(33.3)
Total		2953(100.0)	3(0.10)

Among the 1200 blood donors screened for HBs Ag and anti HCV antibodies, a 29 year old male was found to be reactive for HBs Ag and one female aged 23yrs was reactive for anti HCV antibodies, both by ELISA method.

Table 4: Total prevalence of HBV and HCV infection among donors and patients:

Category	Number Screened		Positivity	
	HBV	HCV	HBV (%)	HCV (%)
Patients	5191	2953	12(0.2)	3(0.1)
Donors	1200	1200	1(0.08)	1(0.08)
Total	6391	4153	13(0.2)	4(0.09)

Discussion

In India most people with chronic Hepatitis B or C are unaware of their infection, putting them at serious risk of developing cirrhosis or liver cancer which are life threatening. In this study for seroprevalence of HBV and HCV infection, samples were evenly distributed among both sexes and major contribution of samples are from age group 20-40

years and 40-60 years. According to the WHO report on prevention of HBV in India, [4] HBsAg prevalence among general population ranges from 0.1% to 11.7%, being between 2% and 8% in most studies [5]. In our study the total prevalence of HBV infection among the donors and patients was found to be 0.2%, which is similar to another study from north Kerala where Sandesh, et al had reported 0.89% positivity [6]. The data from various studies show wide geographic variations, which may represent differences in socioeconomic status or cultural practices in different regions.

In the present study all the HBsAg positive samples were from male population and no cases were reported from the females. Statistical analysis by Fisher's Exact test for HBsAg positivity among both sexes shows a 'p' value of 0.001 which is statistically significant. Our finding was correlated well with study in Kerala by Antony et al. which reports that HBV infection in males is 69.23% and in females 30.76% [7]. This male predominance of infection is apparent in other similar studies all over the world [8,9].

The age distribution of our all positive samples shows even distribution among age groups 21-40 and 41-60 years. No cases were identified in rest of the age groups which comprises pediatric and geriatric population. Antony et al. observed that the highest frequency of cases of HBV occurred (44.23%) in 20-39 years followed by 19.23% in 40-59 and least number of infection was reported in <19 years and above 60 years age group [7]. Khan, et al. in their study on HBV infection revealed the highest percentage of infection which occurred in the age group of 21-30 years (34.93%) followed by 23.83% in 31-40 years [9]. The mean age for HBsAg positivity was found to be 37 years in our study. Statistical analysis for HBV infection among various age groups by Mann-Whitney U test shows a 'p' value of 0.257 which is not statistically significant. Even though positive cases are seen more in adult age group there is no statistical significance for HBsAg positivity and age group because the maximum number of persons screened is from this group.

Out of 1200 voluntary blood donors only one (0.08%) had HBV infection in this study. Based on several studies from different parts of the country, many of the blood banks show HBsAg prevalence was 0.2-4%, most of which have prevalence much lower than that of the commonly quoted prevalence data [10].

The seroprevalance rate of HCV among the blood donor population in India is 1.8% - 2.5 %, and the community seroprevalence has been reported to be 0.87% [2]. Of the total 4153 samples, the seroprevalence of HCV infection was found to be (0.09%). Among the 1200 blood donors only one person had HCV infection (0.08%) which is lesser than other studies. In a Kerala based study by Sandesh et al, in voluntary blood donors anti HCV was positive in 0.33% and job seekers to Middle East Asia, a representation of the general population had 0.12% prevalence of HCV which is similar to our study [6]. Using third-generation ELISA, the prevalence of anti-HCV antibody among voluntary or replacement blood donors has been reported from India in 5 large studies that included 57,671 blood donors and has ranged from 0.7% to 1.8% [3].

As per National Centre for Disease Control, India still needs to work in areas of generating data

for evidence -based policies, implementing preventive

measures, raising awareness and

partnerships, and screening and management of viral hepatitis.

Conclusion

In comparison with studies from other parts of the country the prevalence rates of HBV and HCV infections in this region were found to be less. The infection is seen predominantly in adult male population. In the voluntary blood donors, which is a cross section of the general population, the testing showed very low prevalence rates

There is a need for large field studies to better understand HBV & HCV epidemiology and to identify high prevalence areas, and public health measures to be taken to prevent disease transmission and decrease the burden of the disease.

Acknowledgement – The authors gratefully acknowledge the assistance of Sheejamol for reviewing the statistical analyses and Faisal K.A. for the technical support.

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