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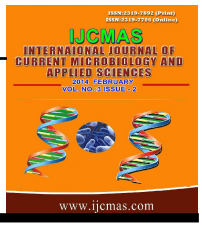

Original Research Article

Seroprevalence of Hepatitis C Virus Infection among Patients attending a rural teaching hospital in South India:A Three Year Study

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A B S T R A C T

In India the frequency of Hepatitis C infection ranges from 0.1-8% in general population with variations in different parts of the country. Patients undergoing any surgical procedure may have this infections, demanding special precautions. The study was aimed to determine the sero-prevalence of Hepatitis C virus (HCV) among patients attending Chennai Medical College Hospital and Research Centre, Trichy, Tamilnadu, over a period of 3 years (2011-2013). It was a retrospective study which was carried out in 10136 patients by using 4th generation HCV-Tridot .Those found positive on screening test were confirmed by third generation Enzyme Linked Immunosorbent Assay(ELISA) The study population comprised of 10,136 individuals . The overall seroprevalence was found to be 0.68% **.** Among the positive cases, the seroprevalence in males and females was 58% and 42% respectively and the frequency of HCV among age groups 0-20, 21-40, 41-60, >60 was 0%(0), 21.7%(15), 65.2%(45), 13%(9) respectively. Highest prevalence was observed among subjects of 41-60 years age group.

Introduction

Hepatitis C virus (HCV) infection is a global problem. It is transmitted by blood or body fluids like semen, saliva or vaginal secretions (Weiss *et al*., 2005). Majority of the patients are asymptomatic (Sampietro *et al*., 1998) and pose great danger of spreading these infections to the society and medical personnel particularly (Choudhary *et al*., 2005). The seroprevalence of HCV globally ranges between 0.2-2%(Wilber, 1995) with 170 million persons chronically infected and 3-4 million persons infected each year (Shepard *et al*., 2005). Among Indian blood donors, the seroprevalence varies from 0.48% in Vellore (Issar *et al*., 1995) to 1.85% in New Delhi (Panigrahi *et al*., 1997).

Hepatitis C can present as acute or chronic hepatitis. Most of the cases of acute hepatitis are asymptomatic (Sampietro et al., 1998). Symptomatic acute hepatitis with jaundice is seen in only 25% of patients and this virus usually does not cause fulminant hepatitis in

immunocompetant individuals. Spontaneous viral clearance of HCV infection is unusual with nearly 54-86% of the infected individuals progressing to chronic hepatitis (Alter *et al*., 1992). Approximately a fifth of the patients with chronic hepatitis C progress to cirrhosis over a decade (Liang *et al*., 2000).The patients with cirrhosis are at a higher risk of hepatocellular carcinoma with nearly 1-4% of patients developing this complication every year(Fattovich *et al*., 2004).

It is now widely recognized as one of the common etiological agents for cirrhosis of liver. It is the leading cause of liver transplantation and the most common chronic blood borne infection in developed countries like the USA (Mukhopadhya, 2008).

The reported prevalence rates of HCV vary widely between developing countries and a developed country. In India as well the pattern is not uniform (Issar *et al*., 1995; Panigrahi *et al*., 1997). Limited information is available on this issue in Tamilnadu, South India. Hence the present study was undertaken to estimate the seroprevalence of HCV in both sexes and different age groups in patients attending our hospital.

Materials and Methods

This was a retrospective study which was carried out among the patients who were admitted for surgery to Chennai Medical College Hospital and Research Centre, Trichy, Tamilnadu, India over a period of 3 years (Jan 2011 – Dec 2013). Patients with known liver disease were excluded from the study. These tests were carried out as part of preoperative screening, antenatal screening, screening on haemodialysis patients, on patients suspected to have HCV infection after getting an verbal consent. The sera were initially tested for the detection of antibodies to HCV by 4th generation HCV-Tridot (Diagnostic Enterprises, H.P, India) .All the positive sera were further analyzed by 3rd generation ELISA (J.Mitra & Co.Pvt. Ltd, New Delhi, India).This was a qualitative assay, with each micro-well being coated with the combination of recombinant antigens to the structural and non-structural HCV proteins. The validity of the ELISA tests was assessed by means of acceptance criteria which were laid down by the manufacturer for the absorbance of the reagent blank as well as for the mean absorbance of the positive and negative controls which were present with the test kits. The cut off value for reporting the positive results was calculated as per the manufacturer's directions. Known positive and negative controls were used as the external controls. The results were analyzed using chi-square test.

Results and Discussion

Out of the 10,136 patients who were studied, there were 69 (0.68%), anti HCV sero-positive cases. Among the 10136 individuals 5753 (56.8%) were males and 4383 (43.2%) were females. Among the positive cases, though statistically insignificant (p value = 0.84), majority were of the age group of 41 to 60 years (65.2%), with a male preponderance (58%). The anti-HCV positivity showed a significant downward trend during the study period. There was an increase in the prevalence among the male population as compared to that in females, as shown in (Table-1) and a majority of them belonged to the age group of 41-60 years, as shown in (Table-2).

Table.1 Gender wise Prevalence of HCV

Year	Male tested	Male positives	Female tested	Female positives	Total tested	Total positives
2011	413	10(2.42%)	167	2(1.2%)	580	12(2.07%)
2012	2193	20(0.9%)	1277	16(1.25%)	3470	36(1%)
2013	3147	10(0.32%)	2,939	11(0.37%)	6086	21(0.35%)
Total	5,753	40(0.7%)	4383	29(0.66%)	10,136	69(0.68%)

Table.2 Year wise and age wise prevalence of HCV

Year	0-20yrs		21-40yrs		41-60yrs		>60 yrs		Total	
	Tested	Positives	Tested	Positives	Tested	Positives	Tested	Positives	Tested	Positives
2011	79	0	204	1	295	10	102	1	680	12
2012	315	0	1,207	11	1,278	20	546	5	3,346	38
2013	682	0	2,348	3	2,327	15	753	3	6,110	19
Total	**1076**	**0**	**3,759**	**15(0.4%)**	**3,900**	**45(1.03%)**	**1,401**	**9(0.64%)**	**10136**	**69(0.68%)**

For any seroprevalence estimation, the appropriate study subject would be a sample from the general population. However, general population seroprevalence are hardly ever available and the prevalence in blood donors is often used. Usually blood donor groups are young adults and also students, rendering substantial proportion of the population unestimated. Securing the consent of healthy individuals in a community for blood testing is a difficult task especially, the person is a child or elderly. A hospital based serological survey offers several advantages. These problems were avoided by conducting the study in a hospital, where serum samples sent for routine investigations were tested for HCV seroprevalence. Hence, no extra prick was needed for serum sampling.

In the present study, the seroprevalence of HCV among patients attending our hospital was found to be 0.68% which was similar to the study done in West Bengal (0.87%) among healthy population (Chowdhury *et al*., 2003). A study by Khan *et al*., (2007) Ahmad *et al*., (2006) reported 3.12% , 2.57% seroprevalence, among patients undergoing orthopaedic surgery and cataract surgery respectively.Our study is in contrast to the hospital based study, done in Mauritius in 1994 (5.9%) (Schwarz *et al*., 1994), in Ethiopia (6.0%) (Frommel *et al*., 1993) and in Puducherry (4.8%) (Bhattacharya *et al*., 2003).A study by Jahangir *et al*., (2012) reported 27% prevalence among patients presenting to ophthalmic surgery. In India among blood donors it varies from 0.48% in Vellore (Shepard *et al*., 2005) to 1.85% in New Delhi (Issar *et al*., 1995). A survey in rural Maharashtra reported only one positive among 1054 apparently healthy persons (0.09%) (Chadha *et al*., 1998) .The prevalence rate is known to vary considerably from country to country, even within the country from region to region, probably because of cultural factors and social habits that influence HCV transmission.

Based on age wise and sex wise analysis, it was found that the prevalence of HCV was maximum in 41-60 years as compared to younger males. This distribution is similar to what is described in other studies (Bhattacharya *et al*., 2003; Abdel-

Aziz *et al*., 2000). Our study is in agreement with the fact that male population is more affected by HCV than females. This could be attributed to their exposure status to various HCV risk factors which was quite evident from the life style.

In the present study, the blood samples were collected shortly after hospital visit thus ruling out the risk of iatrogenic transmission during investigative, therapeutic, and preventive procedures in the hospital. .

Because hepatitis C virus infection are serious and the cost of treatment is high, the fact that the prevalence of anti HCV antibodies is at present low should not be an argument for not screening blood donors for anti HCV and eliminating those who are positive.

People with known HCV infection should be councelled regarding ways to reduce the risk of transmitting HCV to others, and means of minimising their risk for HCV related complications. Practising safe health care related procedures should be emphasized in our country as main modes of transmission of infection identified were related to these.

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