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Seroprevalence of Hepatitis C virus among hospital based general population in Bijapur, Karnataka, India.

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Abstract: Hepatitis C virus (HCV) can cause asymptomatic infection and chronic infection with HCV is one of the major causes of liver cirrhosis and hepatocellular carcinoma. According to World Health Organization (WHO) there are 180 million people affected with HCV worldwide and about 12.5 million carriers in India. The present study was undertaken to determine the prevalence of hepatitis C virus among hospital based general population in Bijapur, a district of North Karnataka. Seroprevalence of hepatitis C virus was determined using a third generation ELISA. The study population comprised of one thousand and two hundred individuals attending a tertiary care center in Bijapur. The overall seroprevalence was found to be 2.6%. Out of 32 seropositive patients, 18 were males and 14 were females. Investigating seroprevalence of hepatitis C virus in the community provides an opportunity to investigate risk factors for transmission, the natural history of infection and effectiveness of preventive methodologies.

Key Words: Seroprevalence; Hepatitis C; ELISA

Introduction

Hepatitis is one of the major health problems in Asia.[1] Hepatitis C virus (HCV) can cause asymptomatic infection[2] and chronic infection with HCV is one of the major causes of liver cirrhosis and hepatocellular carcinoma. According to World Health Organization (WHO) there are 180 million people affected with HCV worldwide[3] and about 12.5 million carriers in India.[4] WHO estimated global prevalence of HCV as 3%.[5]

There is a great variability in HCV's geographical distribution, transmission routes and other factors in the studied populations. High prevalence is found in developing countries with limited resources and facilities such as in Asia and Africa and low prevalence in developed nations such as in North America, North and West Europe and Australia.[6]

Studies in India have revealed a seroprevalence of 1.8% of HCV infection among the general population.[7] But the impact of HCV infection in India may still be just emerging with serious short comings in the country's blood banking system as well as the health administration's inability to curb reuse of unsterilized needles.[8] The high prevalence of HCV and the need to understand its epidemiology warrants periodic surveillance of the disease to determine specific healthcare measures for disease prevention and control.[9]

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The present study was undertaken to estimate the seroprevalence of HCV in both sexes and different age groups in a hospital based general population.

Materials and Methods

Study design and patients

The study was performed in the Department of Microbiology, Shri B.M. Patil Medical College, Hospital and Research Centre (SBMPMC, H and RC), Bijapur, Karnataka (Constituent college of BLDE University, Bijapur, Karnataka). The study protocol was approved by Institutional Ethical Committee of BLDE University. A total of one thousand and two hundred patients visiting various out-patient and in-patient departments of SBMPMC, H and RC were included in the study. The duration of the study period was three years (from March 2011 to February 2014).

Specimen collection

Blood samples were drawn from the patients and serum was separated within two hours after blood sampling. All the serum samples were divided into 0.5 milliliter (ml) aliquots and stored at – 20^0C. Serum samples were collected from six different age groups (0-9 years, 10-19 years, 20-29 years, 30-39 years, 40-49 years, 50 years). A minimum of 196 serum samples were collected from each age group.

Immunoassay

All the sera were tested for the presence of antibodies against HCV proteins by a third-generation enzyme immunoassay kit (SD HCV ELISA). The tests were performed according to the manufacturer's instructions with adequate controls, and the absorbance of the solution in the wells were read at 450 nm within 15 minutes of final step by ELISA reader.

Statistical analysis

The results were analysed using the chi-square test.

Table: Age and sex distribution of hospital based general population with HCV seropositivity

Age groups (In Years)	Males	Males anti-HCV positive (In %)	Females	Females anti-HCV positive (In %)	Total anti-HCV positive (In %)
0-9	105	1(0.95%)	91	1(1.1%)	2(1.02%)
10-19	97	2(2.1%)	99	1(1.0%)	3(1.53%)
20-29	110	3(2.7%)	92	2(2.2%)	5(2.48%)
30-39	108	3(2.8%)	96	5(5.2%)	8(3.92%)
40-49	116	7(6.0%)	90	3(3.3%)	10(4.63%)
≥50	110	2(1.8%)	86	2(2.3%)	4(2.04%)
Total	**646**	**18(2.8%)**	**554**	**14(2.5%)**	**32(2.6%)**

Results

Reporting a prevalence of 4.8%.[2] The global prevalence of HCV ranges between 0.2-2%.[11] The prevalence of HCV in Greece is 0.5%, lower than the rate reported in USA (1.8%) and Mediterranean Europe (1-2.9%) studies.[12] In India, it is estimated that 1.8-2.5 % of the population is presently infected by HCV.[13] The prevalence of HCV infection varies from region to region because of local socioeconomic factors, which potentially influence the transmission

The age and sex distribution among the hospital based general population is shown in the table below: Thirty-two out of one thousand and two hundred individuals tested positive for antibody to HCV (2.6%). The seroprevalence among males and females were 2.8% (18) and 2.5% (14) respectively. In the exposure rates of males and females there was no statistically significant difference. The highest seroprevalence was found among males of the age group 40-49 years (6%) and females of age group 30-39 years (5.2%).

Discussion

In any seroprevalence estimation, the appropriate study subject would probably be a sample from the general population. However, general population seroprevalence are rarely available and the prevalence in blood donors is often used. Blood donor groups are usually young adults, hence seroprevalence in other age groups, like children and aged cannot be estimated. A hospital based serological survey offers several advantages. Individuals attending a hospital undergo a battery of investigations that necessitate giving a blood sample. All the samples in the present study were collected after consent from patients and laboratories meant for other investigations. Hence no extra episode of venipuncture was needed for serum sampling. This saved time, manpower and cost.[2]

In the present study, the seroprevalence of HCV among hospital based general population was found to be 2.6%. This is similar to other hospital based study done in 2002 by S Mishra *et al.,* [10] in contrast to a study done by S Bhattacharya *et al.,* and prevalence in a specific geographical area.[14] In India, seroprevalence of HCV among blood donors varies from 0.66% in Uttarakhand[14] to 5.5% in Madurai.[15] The high prevalence of alcoholism (leading to chronic liver disease) may have a contributory effect on the seroprevalence of HCV.[2] In a study conducted in Patna the prevalence of HCV in chronic liver disease patients was found to be 5.4%[1] which is significantly higher compared to prevalence of HCV infection among hospital based general population.

The prevalence seems to increase with age because of continuing risk of exposure. The prevalence of HCV in the 0-9 year's age group could be due to the enhanced risk of exposure from perinatal transmission of virus. In conformity with other studies, a higher prevalence was found among3 males (2.8%) than among females (2.5%). There is a scarcity of information on HCV prevalence particularly in developing counties like India. Our study on the 2 prevalence of HCV

infection among hospital based general population is sure to provide a useful insight to researchers working on HCV infection.

The general population should be educated about the virus and its modes of transmission. The large reservoir of HCV infection in the community provides an opportunity to investigate risk factors for transmission, the natural history of infection and effectiveness of preventive methodologies.

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