

Seroprevalence of Hepatitis C virus-specific antibodies in a hospital based population attending tertiary care center: A study from Northern Telangana, India

Padma vali Palange¹, Venkatramana Kandi², Bhoomigari Mohan Rao³

¹Assistant Professor, ²Associate Professor, ³Professor & Head, Department of Microbiology, Prathima Institute of Medical Sciences, Nagunur, Karimnagar, Telangana, India, 505417.

Address for correspondence: Dr Padma vali N Palange, Assistant Professor, Department of Microbiology, Prathima Institute of Medical Sciences, Nagunur, Karimnagar, Telangana, India, 505417.

Email: padma vali@gmail.com

ABSTRACT

Introduction: Hepatitis C virus (HCV) infection is a bloodborne infection, most commonly transmitted through sharing of needles (unsafe injection practices), blood and blood products whereas sexual and vertical routes of transmission are less common. HCV causes silent acute infection to severe chronic infection manifesting as chronic liver disease, fibrosis, cirrhosis, cancer, and liver failure. However chronic HCV infection-related complications can be prevented by early screening and treatment if required.

Objectives: To evaluate the seroprevalence of HCV-specific antibodies in a hospital-based population.

Materials & Methods: The present hospital record-based, a cross sectional study was carried out at the rural based tertiary care center, in Northern Telangana, India, from January 2017 to July 2017. A total of 3748 blood samples were screened for HCV-specific antibody using 4th generation HCV TRI-DOT (Diagnostic Enterprises, H.P. India). The data of those, who were found to be reactive for HCV-specific antibodies were statistically analyzed by chi-square test, and results were considered significant if the p value was <0.05.

Results: Out of 3748 blood samples tested, 7 (0.19%) were found to be reactive for the HCV-specific antibody which includes 5 (0.23%) males and 2 (0.12%) females. The most commonly affected age group was less than 10 years.

Conclusion: In this study, the seroprevalence of HCV-specific antibody was 0.19%. This study highlights the current prevalence rate of HCV infection at our tertiary care center recommending mandatory screening of hospital attending population for early detection and prevention of chronic HCV infection related complications.

Keywords: Hepatitis C virus, HCV-specific antibody, hospital population, seroprevalence

INTRODUCTION

Hepatitis C virus (HCV) is an RNA virus that belongs to the *Flaviviridae* family and genus *Hepacivirus*. HCV infection is a bloodborne infection, most commonly transmitted through sharing of needles (unsafe injection practices), blood and blood products whereas sexual and vertical routes of transmission are less common. HCV causes silent acute infection lasting a few weeks to severe lifelong chronic infection manifesting as chronic liver disease, fibrosis, cirrhosis, cancer, and liver failure^{1,2}.

HCV infection is worldwide but WHO Eastern Mediterranean and European Regions are most affected regions with the prevalence of 2.3% and 1.5% respectively, whereas the prevalence of HCV in India is 0.5 - 1%. Only 55 - 85% infected individuals develop chronic HCV infection and 15 - 45% infected person spontaneously clear the virus without any treatment¹.

Unawareness of asymptomatic infection may lead to transmission of the HCV infection to others unknowingly. But detection of anti-HCV antibody in patient serum is quite easy with rapid diagnostic test¹. With this background, the present study was carried out at tertiary care center to find out the seroprevalence of HCV-specific antibody among hospital attending population.

MATERIALS AND METHODS

A cross sectional study was carried out from January 2017 to July 2017 on patients attending OPDs and admitted to various IPDs at rural based tertiary care center in Northern Telangana, India. A total of 3748 blood samples were collected as a part of the preoperative screening, antenatal screening, screening on hemodialysis patients, patients suspected to have HCV infection after informed consent. Separated serum was screened for qualitative detection of HCV-specific antibody by using 4th generation HCV TRI-DOT (Diagnostic Enterprises, H.P. India). All the tests were performed and result interpreted as

per manufacturer's instructions. The data statistically analyzed by the chi-square test, and results were considered significant if the p value was <0.05.

RESULTS

In our study, out of 3748 blood samples, 7 (0.19%) were reactive for the HCV-specific antibody. The highest seroprevalence rate was found in less than 10 years of age group [Table 1]. This association between the age group and HCV-specific antibody seropositivity was statistically significant (p value <0.05).

Table 1: Age-wise seropositivity of HCV-specific antibody in hospital based population

Age group in years	Total no. of samples	Total no. of HCV antibody positivity (%)
<10	75	3 (4)
10-19	244	1 (0.41)
20-29	433	00
31-39	545	00
40-49	706	2 (0.28)
>50	1745	1 (0.01)

p value = < 0.0000001

Table 2: Gender-wise seropositivity of HCV-specific antibody in hospital based population

Gender	Total no. of samples (%)	Total no. of HCV antibody positivity (%)
Male	2142 (57.15)	5 (0.23)
Female	1606 (42.85)	2 (0.12)
Total	3748	7 (0.19)

p value = 0.4

In our study, the highest seropositivity of HCV-specific antibody was found in males 5 (0.23%) followed by females 2 (0.12%) however this association was not found statistically significant (p value >0.05) [Table 2].

DISCUSSION

HCV infection varies from asymptomatic acute stage to severe chronic illness of liver. The early HCV infection can be diagnosed by screening test like, qualitative detection of HCV-specific antibody in patient's serum or plasma and raised serum ALT (alanine aminotransferase) levels. Further, a nucleic acid test for HCV ribonucleic acid (HCV RNA viral load) is needed to

confirm chronic infection because about 15-45% of people infected with HCV, spontaneously clear the infection by strong immune response without the need for treatment. Although no longer infected, they will still test positive for HCV-specific antibody^{1,2}.

In our study, the overall seropositivity of HCV-specific antibody in hospital based population was found to be 0.19%. This result was comparable to the previous studies conducted in various parts of India and reported HCV-specific antibody seroprevalence ranging 0.22-0.68% in hospital-based population³⁻⁷. However higher seroprevalence rate 1.5 - 5.5% was also reported by few studies in hospital based population⁸⁻¹⁶.

Outside India also, the seroprevalence of HCV-specific antibody among hospital-based population have shown high values in Mauritius, Ethiopia, and Pakistan as 5.9%, 6%, and 9% respectively¹⁷⁻¹⁹.

Factors like unawareness of routes of transmission, socioeconomic status, education, access to healthcare, injection practices, migrant population, unsafe sexual practices could have a contributory effect on the overall seroprevalence rate of HCV-specific antibody.

The present study has reported higher seroprevalence of HCV-specific antibody in males 5 (0.23%) compared to females 2 (0.12%). This was in agreement with other reported studies^{6-8,10,12-14}. Male predominance may be due to high exposure level to various risk factors due to their lifestyle. This finding was in contradiction to a study by Ayele AG et al, where female predominance has been noted²⁰. Parimal H Patel et al reported the same seroprevalence in both genders.

Our study showed maximum seropositivity in < 10 years (4%) of age group followed by 40-49 years (0.28%), 10-19 years (0.41%), and least in >50 years (1.01%). This was in agreement with the study done by Rajani M et al, who reported 5.1% among 0-10 years of age group. This could be due to vertical transmission of asymptomatic HCV infection or samples screened from pediatric patients diagnosed with thalassemia and other hemoglobinopathies. In India, mandatory screening of blood and blood products introduced in late 2002 had minimized the transmission of HCV infection leaving vertical transmission as one of the most predominant modes of infection in children²¹. Various studies have demonstrated high seroprevalence of HCV-specific antibody among adult population due to the cumulative risk of exposure to various risk factors, or late diagnosis^{5-7,10-11,13-15,22}. This association between age group and HCV-specific antibody seropositivity was significant statistically (p value < 0.05).

CONCLUSION

Our study reports 0.19% seropositivity of HCV-specific antibody in a hospital-based population, moreover children <10 years are more affected. This study recommends mandatory screening of population attending hospital with or without risk factors which would increase the early detection and prompt treatment can be initiated to reduce morbidity due to chronic HCV related complications. At present, there is no vaccine available for HCV but screening of blood and blood products, avoiding sharing of needles (unsafe injection practices), safe sexual practices, and health education regarding HCV transmission, infection and preventive measures would reduce the global burden of HCV. Moreover, continuous surveillance will measure the effect of preventive measures on emerging HCV infection.

Limitation of the study - being hospital-based, results cannot be generalized to a general population.

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