

## Original Research Article

# Seroprevalence of hepatitis C virus among patients at a tertiary health care centre in Rajasthan, India

Ajay Mathur<sup>1</sup>, Laxmi Kant Goyal<sup>1\*</sup>, Manoj Kumar Sharma<sup>1</sup>, Arvind Kumar Gupta<sup>2</sup>,  
Nupur Hooja<sup>3</sup>, R. N. Yadav<sup>1</sup>

<sup>1</sup>Department of Medicine, SMS Medical College, Jaipur, Rajasthan, India

<sup>2</sup>Department of Medicine, Pandit Deen Dayal Upadhyaya Hospital, Jaipur, Rajasthan, India

<sup>3</sup>Department of Obstetrics and Gynecology, SMS Medical College, Jaipur, Rajasthan, India

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### \*Correspondence:

Dr. Laxmi Kant Goyal,

E-mail: [drkkgoyal@gmail.com](mailto:drkkgoyal@gmail.com)

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## ABSTRACT

**Background:** To ascertain the prevalence of Hepatitis C infection among patients visiting a tertiary care center in Jaipur, Rajasthan.

**Methods:** An observation analytic study was done at a tertiary care center affiliated to Medical College with retrospective analysis of the hospital data of two calendar years. During this period HCV infection screening (anti-HCV) was offered to every suspected patient admitted in hospital and every pregnant women visiting antenatal care clinic.

**Results:** The study prevalence of HCV infection was 0.05% (13/25311). The prevalence was more in female (0.03%) than male (0.02%). The study prevalence of anti-HCV among pregnant female was 0.02% (3/16224). Maximum positive cases (4/13, 30.77% positive cases) were in the age group of 21-30 years (sexually active group) and >50 years age group while minimum positivity was found in children (00 case, 0-20 years age).

**Conclusions:** In this study, prevalence of HCV infection was 0.05%. The study prevalence of HCV among pregnant females was 0.02%. Maximum positive cases (4/13, 30.77% positive cases) were in the age group of >50 years and 21-30 years. This study aids in view to strengthen proper screening for HCV infection to reduce HCV related morbidity and mortality

**Keywords:** Anti- Hepatitis C virus, Hepatitis C virus infection, Pregnant female, Prevalence, Screening

## INTRODUCTION

The prevalence of Hepatitis C virus (HCV) infection is different in various part of the world. The most affected regions are the WHO Eastern Mediterranean Region and the WHO European Region, with an estimated prevalence in 2015 of 2.3% and 1.5% respectively.<sup>1</sup> Prevalence of HCV infection in other WHO regions varies from 0.5% to 1.0%.<sup>1</sup> Globally approximately 80 million people are estimated to have chronic hepatitis C virus (HCV)

infection.<sup>1</sup> About 20 million Indian had HCV infection.<sup>2</sup> One systemic review found prevalence of HCV (anti-HCV) to be 0.85% in community-based studies, 0.44% in blood donors and 0.88% among pregnant women in India.<sup>3</sup> HCV infection is associated with significant morbidity and mortality. The clinical spectrum of HCV infection spreads widely from asymptomatic infection to chronic liver disease, liver cirrhosis, liver failure and hepatocellular carcinoma.<sup>4</sup>

Of the various modalities of HCV transmission, vertical mother to child transmission and transmission through blood products are avoidable. In order to achieve the WHO goal of elimination of viral hepatitis (including HCV) as a public health threats by 2030, these transmission routes have to be addressed in full measure.<sup>5</sup> For a given population, prevalence rates of HCV infection must be ascertained at suitable periods to monitor the decline / rise of the rates. Irony of HCV infection per se is the paucity of symptoms. Global emphasis is on wide surveillance. In Rajasthan, under the Mukhyamantri Nishulk Jaanch Yojna (MNJY), anti-HCV test (screening for HCV infection) is made available to the population, free of cost. This would have a tangible impact in the decades to come.

Authors are reporting the HCV prevalence figures which are perhaps the largest report of its kind ever done and spread over 24 months from a tertiary medical care center.

## METHODS

The present study was an observation analytic study done at a tertiary care center affiliated to Medical College in the capital city of Rajasthan. The hospital data of two calendar years were analysed retrospectively. During this period, every suspected patient admitted in hospital and every pregnant women visiting antenatal care clinic were included in the study and HCV infection screening (anti-HCV) was offered to them. Anti-HCV screening was done after informed consent of the person. The persons who did not give consent were excluded from the study as the HCV infection screening (anti-HCV) was not done.

Five ml of venous blood sample was collected from left antecubital vein under all aseptic precautions from each eligible patient and was transported immediately to the laboratory for testing. In case of delay, serum sample was separated & stored in refrigerator at 2-8°C till further testing. Serum was separated in clean test tubes after clotting via centrifugation. The HCV screening was done using commercially available enzyme linked immunosorbent assay kits (ELISA; Trustwell, Athenes-Dx Pvt. Ltd, India) for detection of anti-HCV antibody (anti-HCV) in institutional premises, after consent of the patient and according to manufacturer's instructions. The person performing the test was blinded to the clinical state of the patients.

When the serum sample was found positive for anti-HCV then the concern patient was labelled as HCV infected.

## RESULTS

In this study, total 13/25311 samples were found positive for anti-HCV so the study prevalence of HCV infection was 0.05%. The prevalence was more in female (0.03%) than male (0.02%) (Table 1).

**Table 1: Seroprevalence of anti-HCV among study population.**

Sex	Positive		Negative		Total	
	N	%	N	%	N	%
Male	6	0.02	3094	99.80	3100	100
Female	7	0.03	22204	99.97	22211	100
Total	13	0.05	25298	99.95	25311	100

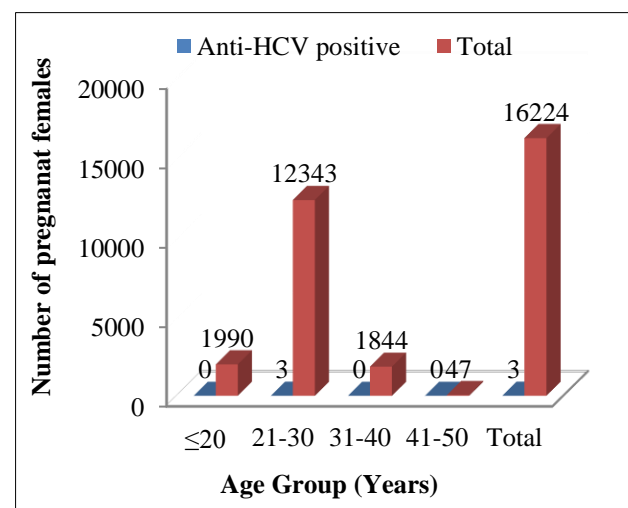
The study prevalence of anti-HCV among pregnant female was 0.02% (3/16224) (Table 2).

**Table 2: Seroprevalence of anti-HCV among female subjects.**

	Positive		Negative		Total	
	N	%	N	%	N	%
Pregnant	3	0.02	16221	99.98	16224	100
Non-pregnant	4	0.07	5983	99.93	5987	100
Total	7	0.03	22204	99.97	22211	100

**Table 3: Age wise distribution of study population.**

Age (years)	Anti-HCV positive		Total	
	N	%	N	%
0-10	0	0	210	0.83
11-20	0	0	2738	10.82
21-30	4	30.77	14651	57.88
31-40	2	15.38	3766	14.88
41-50	3	23.08	1494	5.90
>50	4	30.77	2542	9.69
Total	13	100	25311	100



**Figure 1: Age wise distribution of pregnant females.**

Maximum positive cases (4/13, 30.77% positive cases) were in the age group of 21-30 years (sexually active group) and >50 years age group while minimum positivity was found in children (00 case, 0-20 years age) (Table 3).

Among pregnant women, all positive cases (3/3, 100% positive cases) were in the age group of 21-30 years (Figure 1).

## DISCUSSION

Hepatitis C virus is a formidable public health problem with catastrophic consequences like chronic hepatitis, liver cirrhosis and hepatocellular carcinoma. More importantly, the carriers serve as reservoirs to spread the infection onwards. Authors are reporting the HCV prevalence figures, the sample size of which is perhaps the largest of such studies.

In India, overall prevalence of HCV is reported to be 0.19-0.68% in various hospital based studies.<sup>6-10</sup> One systemic review found prevalence of HCV (anti-HCV) to be 0.85% in community-based studies, 0.44% in blood donors and 0.88% among pregnant women in India.<sup>3</sup> In our study, the prevalence of HCV infection is 0.05% overall and 0.02% among pregnant women. It is less than other reports from different parts of India, West Bengal (0.87% . %), Haryana (1%) and trainees of Indian Armed Forces (0.44%).<sup>11-13</sup> Studies in tribal population reported HCV prevalence of 2.02-7.89% in Andhra Pradesh.<sup>14-15</sup>

In developing countries like Mauritius, Ethiopia, and Pakistan, the sero-prevalence of HCV infection were reported as 5.9%, 6%, and 9% respectively.<sup>16-18</sup> HCV prevalence is highest in the WHO Eastern Mediterranean Region and the WHO European Region, with an estimated prevalence in 2015 of 2.3% and 1.5% respectively.<sup>1</sup> Prevalence of HCV infection in other WHO regions varies from 0.5% to 1.0%.<sup>1</sup> Worldwide, the prevalence is lowest in developed countries practicing healthy living including improved sanitation and safe transfusion measures.

In this study, 87.75% of the study subjects were female and out of them 73.04% were pregnant. The prevalence of HCV among males was 0.02 % and among females was 0.03%. The prevalence of HCV among pregnant females was 0.02%. The seroprevalence of Hepatitis C virus infection varies between 0.6% to 1.4% in pregnant women in India.<sup>19</sup> Screening of pregnant women for HCV infection is an important tool to decrease the risk of vertical transmission by avoiding prolonged rupture of membrane and invasive obstetric procedure in such patients.<sup>20</sup> Universal screening of women before conception allow timely identification and treatment for HCV infection in order to reduce the vertical transmission of hepatitis C virus.<sup>20</sup>

In current study, maximum positive cases (4/13, 30.77% positive cases) were in the old age (>50 years age group) and in age group of 21-30 years (sexually active group) while minimum positivity was found in children (00 case, 0-20 years age). This finding of old age predominance for HCV infection is similar to other studies in India and abroad.<sup>21-23</sup>

In Rajasthan, under the Mukhyamantri Nishulk Jaanch Yojna (MNJY), anti-HCV (screening for HCV infection) is made available to the population, free of cost. Though this make the screening easy, to achieve the WHO goal of elimination of viral hepatitis (including HCV) as a public health threats by 2030, periodical Surveillance of the HCV is required at stakeholder's level.

This study was done at a tertiary care center with limited study population and the duration. A multicenter, long duration study with large sample size is required to validate the results across the state or country. The current study definitively has built a platform for such larger studies.

## CONCLUSION

In this study, prevalence of HCV infection was 0.05%. The study prevalence of HCV among pregnant females was 0.02%. Maximum positive cases (4/13, 30.77% positive cases) were in the age group of >50 years and 21-30 years.

This study aids in view to strengthen proper screening for HCV infection to reduce HCV related morbidity and mortality.

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