

## Seroprevalance of Hepatitis C in Govt. Medical College Thiruvananthapuram-Cross Sectional Study

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### Abstract

**Introduction:** There are around 70 million people living with hepatitis C Virus (HCV) infection around the world and are at risk of developing liver cirrhosis, progressing to end stage liver disease and liver cancer (hepatocellular carcinoma). Overall HCV prevalence in India is estimated to be 1%, which is also around the global average. However, as India's population is 1.3 billion, the country contains approximately 10 million people living with HCV.

**Aim of the Study:** To estimate the seroprevalence of Hepatitis C in Govt. Medical College Thiruvananthapuram.

**Objectives:** 1. To estimate the age and sex distribution among the Hepatitis C seropositives. 2. To estimate the seropositive among chronic liver disease patients.

**Conclusion:** A total of 7318 including both OP and IP in Govt. Medical College Thiruvananthapuram were tested for Anti HCV. The mean age for the study is 43.2± 19.8 years. The study population have 58% males and 42% females with maximum number of patients coming under the age group 41 to 50. Out of 7318 samples tested 69 were Anti HCV reactive thus showing seroprevalence to be 0.9% (95% CI: 0.706 to 1.094).

**Key words:** Hepatitis C, Seroprevalence, Chronic Liver Disease.

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### Introduction

There are around 70 million people living with hepatitis C Virus (HCV) infection around the world and are at the risk of developing liver cirrhosis, progressing to end stage liver disease and liver cancer (hepatocellular carcinoma). Globally an estimated 700,000 people die annually due

to complications related to HCV infection [1].

The HCV burden is unevenly distributed globally; half of them reside in six countries, one being India. Overall HCV prevalence in India is estimated to be 1%, which is also around the global average. However, as India's population is 1.3

billion, the country contains approximately 10 million people living with HCV. Despite a recent systematic review, the Indian HCV burden is poorly described because of a paucity of community-level data [2].

Based on some regional level studies, it is estimated in India; approximately 40 million people are chronically infected with Hepatitis B and 6-12 million people with Hepatitis C [3].

Chronic HCV infection accounts for 12-32% of HCC and 12-20% of cirrhosis. India has about 3 million to 9 million persons with active HCV infections [4].

The prevalence of HCV infection ranges from 1.2% to 3.8% in different parts of the world and is highest in central Asia (3.8%), east Asia (3.7%) and North Africa/Middle East (3.6%). In the United States (US) 1.6% (2.1% in men and 1.2% in women) and higher (75% of all cases) in people born between 1945 and 1965 [5,6].

The CDC recommends that any person born between 1945 and 1965 receive a one-time screening test for HCV. In addition, individuals not born in that period but with other risk factors—such as a history of injection or intranasal drug use, long-term hemodialysis, birth to an HCV-infected mother, receipt of a blood transfusion or organ transplant before July 1992, use of coagulation products prior to 1987, or incarceration should receive a one-time screening test. Those with ongoing risk factors, such as injection drug users or men with HIV who have unprotected sex with men, should be screened at least annually [7,8].

The World Health Organization (WHO) has set ambitious targets to eliminate HCV infection as a public health problem by 2030. In order to achieve these targets, which include reduction of new infections by 90% and deaths by 65%, there is a need to increase prevention strategies and access to treatment [1].

HCV has been described as a silent killer as it remains asymptomatic for almost 2-3 decades. Approximately 20-30% infected cases automatically resolve the virus and remaining 70-80% of cases lead to chronic hepatitis. The treatment available for Hepatitis C is expensive with severe side-effects. The global epidemiology of HCV is well established. The epidemiology of HCV infection in India is ill-defined and has not been studied systematically [9].

The recommended screening test is either an enzyme immunoassay or enhanced Chemiluminescence immunoassay for antibodies to HCV (anti-HCV), which can be done with a rapid screening test from finger stick capillary blood or venous whole blood (OraQuick HCV, OraSure Technologies, Inc.) or from a regular blood sample. A positive antibody test should be followed up with a qualitative or quantitative polymerase chain reaction test to detect the presence of HCV virus in the blood because patients, who have spontaneously cleared the disease may produce false-positive anti-HCV results.

### **Aim of the Study**

To estimate the seroprevalence of Hepatitis C in Govt. Medical College Thiruvananthapuram.

### **Primary Objectives**

1. To estimate the age and sex distribution among the Hepatitis C seropositives.
2. To estimate the seropositive among chronic liver disease patients.

### **Materials and Methods**

**Study Design:** Descriptive study

**Study period-** July 2013 - December 2013.

**Study population:** All patients attending the out Patient departments and admitted in the hospital Govt. Medical College, Thiruvananthapuram.

**Inclusion criteria:** All blood samples received in the Central Microbiology and Serology Laboratory and Gastroenterology Department in Govt. Medical College, Thiruvananthapuram for both HBsAg and Anti HCV detection.

**Exclusion Criteria:** Hemolysed, Icteric and lipemic blood samples are excluded from the study.

Sample size:  $n = 4PQ/d^2$

$P = 0.057$  and  $d = 10\%$  of  $P$ , sample size = 6617.

**Methodology**

All blood samples received in the laboratories with relevant patient details for HBsAg and Anti HCV antibodies were collected. Blood samples were allowed to clot and centrifuged at 2500 rpm for 5min. Serum was separated and stored in SV2 vials and stored at 2 to 8°C. These serum samples were tested for Anti HCV antibodies using Indirect ELISA (Erba Lisa) prepared with the mixture of synthetic peptides and recombinant proteins of HCV i.e CORE, NS3, NS4 and NS5 using manufacturers procedure. The validity of kit was checked using positive

control negative control, the Cut off value of the kit was calculated according to the Manufacturer instructions. The results were interpreted by comparing the optical density(OD) of the test with that of Cut off value. OD value of specimen above the Cut off value was interpreted as Reactive, whereas below the Cut off value was considered Nonreactive. Reproducibility was tested by retesting the known positive serum and OD values were compared.

**Informed consent:** Informed consent was obtained from all individuals included in this study.

**Ethical approval:** Human Ethics Committee, Medical College Thiruvananthapuram, IEC. No.04/16/2013/MCT dated 19/07/2013.

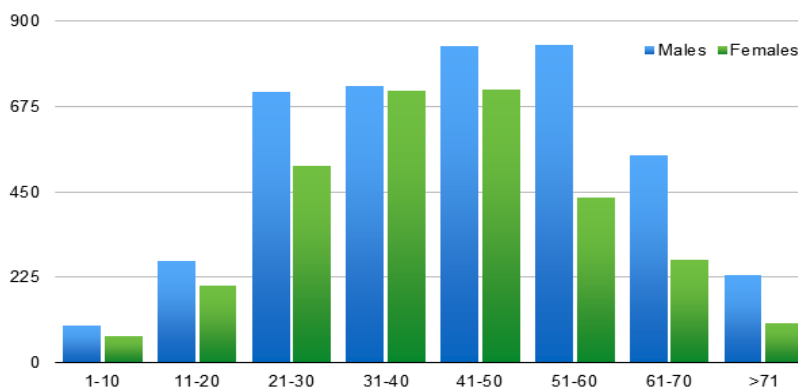
**Results:**

A total of 7318 including both OP and IP patients in Govt. Medical College Thiruvananthapuram were tested for Anti HCV. The mean age for the study is 43.2+/- 19.8 years. The study population have 58% males and 42% females with maximum number of patients coming under the age group 41 to 50.

**Table1. Distribution of Age and gender of the study population.**

	1-10	11-20	21-30	31-40	41-50	51-60	61-70	>71
<b>Males</b>	99	269	714	731	836	837	548	231
<b>Females</b>	71	205	521	719	722	437	272	106

**Chart 1. Age and Gender wise Distribution of the Study population**



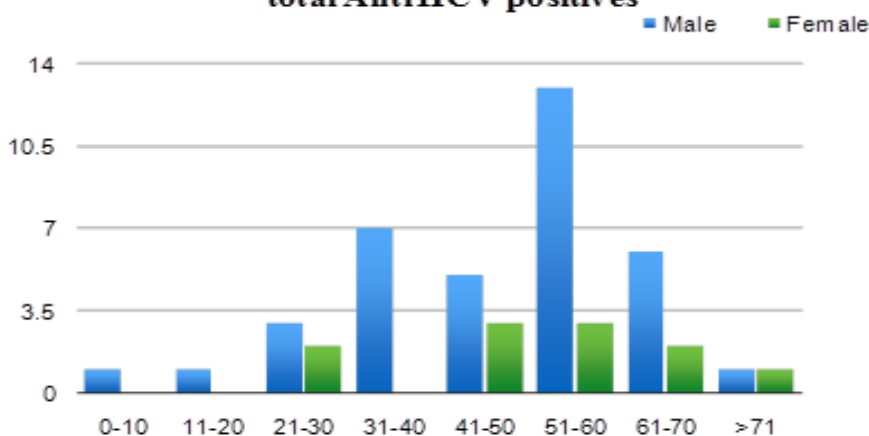
Out of 7318 samples tested 69 were Anti HCV reactive thus showing seroprevalence to be 0.9% (95% CI: 0.706 to 1.094) Among 69 Anti HCV reactive 52 were Males and 17 were Females. Total of 4265 Male patient's samples tested for Anti HCV, 52 were reactive thus showing

prevalence among males to be 1.2% and among 3053 female patients tested for Anti HCV, 17 were positive thus showing prevalence of 0.5% among females. Male gender was found to be significant risk factor (p value<0.003; unadjusted OR- 2.247, 95% CI- 1.298 to 3.88).

**Table 2. Age and Gender distribution of Anti HCV positive cases.**

	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>71
<b>Male</b>	1	1	3	7	5	13	6	1
<b>Female</b>	0	0	2	0	3	3	2	1

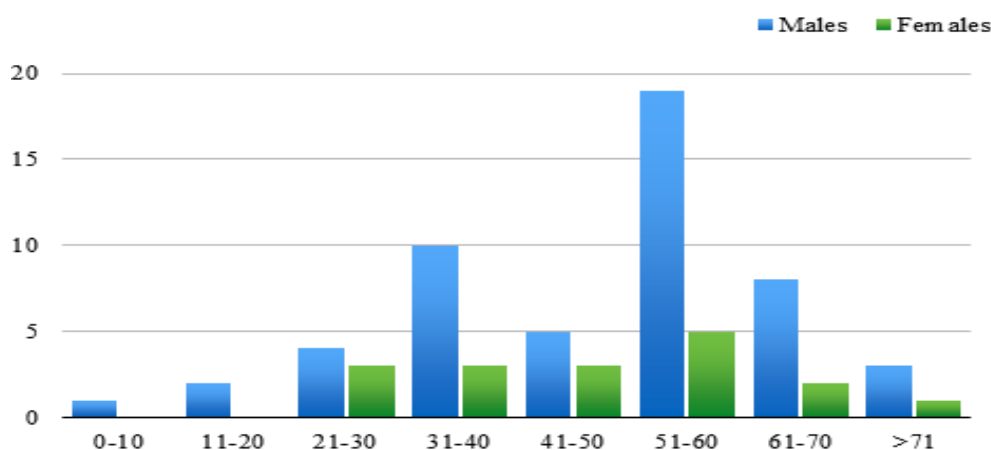
**Chart 2: Distribution of Age and Gender among total AntiHCV positives**



This study shows maximum Anti HCV seropositive in 51-60years (1.9%) followed by 61-70 years(1.2%).

Prevalence of anti HCV was found to be significantly associated with age group(N=7318; p value< 0.010).

**Chart 3: Distribution of Age and Gender among Anti HCV positives excluding 304 chronic liver disease patients.**



**Table 3. By excluding the 304 samples form Gastroenterology Department prevalence of Anti HCV was 0.7%. Prevalence among male and female were 0.9% and 0.37% respectively.**

	0-10	11-20	21-30	31-40	41-50	51-60	61-70	>71
<b>Males</b>	1	2	4	10	5	19	8	3
<b>Females</b>	0	0	3	3	3	5	2	1

Out of 304 patients with chronic liver disease tested for Anti HCV, 21 were reactive thus showing prevalence of 6.9% among chronic liver disease.

### Discussion:

A total of 7318 serum sample, both (IP and OP) received in Central Microbiology Laboratory for testing Anti HCV antibodies. The study population consisted 58% males and 42% females. Out of 7318 samples, 69 were reactive for Anti HCV thus prevalence 0.9% (95% CI: 0.706 to 1.094). The seroprevalence is lower than Studies on seroprevalence of HCV in hospital-based population in India by Bhattacharya S et.al in 2003 at Pondicherry (4.8%), Sharma R et al A in 2007 at Jaipur Rajasthan (1.7%), Rajani M et al in 2014 at New Delhi (1.5%). The seroprevalence in present study is higher than Sood S et al in 2010 at Jaipur Rajasthan, Ramana K et al. in 2013 at Karimnagar Andhra Pradesh, G Vani et al in 2014 at Puducherry, Patil S et al in 2014 at Karad Maharashtra, showing the prevalence of 0.28%, 0.04%, 0.16%, and 0.38% respectively [10].

In a study by Sood A et.al 2018 population based serosurvey in Punjab with 5,543 persons tested for hepatitis C, 3.6% (95% CI: 3.0%, 4.2%) tested positive for anti-HCV (ever infected), and 2.6% (95% CI: 2.0%, 3.1%) tested positive for HCV RNA, indicative of current infection [1].

Study conducted in blood donors of Delhi from 2005 to 2009 by Nagarekha Kulkarni reported prevalence rate of 0.35% for Anti

HCV [11]. A study conducted at Lucknow, Uttar Pradesh among hemodialysis patients by Shanthanu Prakash et.al found Anti HCV prevalence of 6.9% [12].

An increasing prevalence of HCV (0.28-0.35%) was observed in blood donor of Kolkata in 2004-2005 by Bhattacharya P et al [13]. Whereas the study conducted at 2011 in blood donors of Kolkata by B K Das et.al reported almost same rate Anti HCV 0.35% [14]. Prevalence of HCV in North Pakistan was 2.46% in voluntary non remunerated blood donors, Whereas Central Saudi Arabia had reported 0.4% with tendency to increase with increasing age. In Bangladesh prevalence of HCV 0.024% in voluntary blood donors. In Kathmandu, Nepal seroprevalence of HCV was 0.64% [15,16,17].

Among 7318 samples in the present study 304 were from chronic liver disease patients attending department of Gastroenterology. Among 304 samples 21 were reactive for Anti HCV thus showing seroprevalence of 6.9%. Studies showing seroprevalence of Anti HCV among liver disease patients by Chakravarthy A et al in 2005 at Delhi, Chaudhary S et al in 2005 at Kolkatta, Arora U et al in 2007 at Amritsar, Saravanan et al in 2008 at Chennai shows prevalence rate of 25.75%, 19.05%, 13% and 43% respectively [18].

Prevalence of Anti HCV among males are higher with prevalence rate of 1.2% than females with prevalence rate of 0.5% in the present study. Male gender was found to be significant risk factor (p value<0.003; unadjusted OR- 2.247, 95%

CI- 1.298 to 3.88). In the present study Anti HCV prevalence was high in the age group 51-60 (1.3%) followed by 61-70 (1%). Prevalence of anti HCV was found to be significantly associated with age group (N=7318; p value< 0.010). [19] Been Tarkal et.al reported 0.44% prevalence for HCV among blood donors of Chandigarh with high prevalence rate among 51-60 years. These findings are also consistent with most of the studies [10]. whereas in the study by Sood A et.al 2018 showed males, persons aged 40–59, and persons living in rural areas had the greatest odds of being infected with HCV [1].

In the present study prevalence rate of HCV among chronic liver disease 6.7% among males and 7.4% among females. The high prevalence rate seen in the age group >71years (14.2%) in the present study may be due to lesser number of patients tested in the age group, followed by 51-60years (13.3%).

#### **Conclusion:**

Present study conducted on 7318 Patients samples shows Anti HCV prevalence rate of 0.9% (95% CI: 0.706 to 1.094), with prevalence of 1.2% among males and 0.5% prevalence among females. Male gender was found to be significant risk factor (p value<0.003; unadjusted OR- 2.247, 95% CI- 1.298 to 3.88). Present study also shows higher prevalence between 51-60 years (1.3%) followed by 61-70 years (1%). Prevalence of anti HCV was found to be significantly associated with age group (N=7318; p value< 0.010). Among 7318 samples 304 were from chronic liver disease patients and among 304 chronic liver disease patient samples 21 were reactive thus showing the prevalence of 6.9% among liver disease.

**Limitations of the study:** In this study only seroprevalence was estimated, no RT PCR done to estimate the actual infection.

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**Author Contribution:** All authors have accepted responsibility for entire content of this manuscript and approved its submission.

**Competing Interest:** Authors state no conflict of interest.

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