



# Epidemiological Study of Anti HCV Antibodies in Rural Punjab

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## Abstract

**Background:** Hepatitis C virus infection is a very serious and alarming public health concern worldwide. The virus is transmitted through blood and blood related infected products. However sexual and vertical transmission is also reported. Although the infection by Hepatitis C virus is endemic in nature but prevalence as well as incidence has escalating trend in Pakistan particularly in the rural areas. In the beginning it is an asymptomatic infection and majority of the victims remain unaware about the disease.

**Objectives:** To determine the seroprevalence of Hepatitis C in Rural Punjab, Pakistan.

**Methods:** A descriptive epidemiological cross sectional study was conducted from July 2013 to June 2015 in the rural Punjab of Pakistan. The province of Punjab was divided into three zones namely Central,

Southern and Northern zone. Three districts from each zone were sampled and later on three villages from each district were selected. Probability based sampling technique was used however in certain situations the total population was selected. A total sample of 2400 participants was selected with 800 from each zone of Punjab.

**Results:** A total of 2400 subjects from three zones of Punjab participated in this study. Out of these 2400 participants 520 (21.6%) were sero positive against Anti HCV antibodies. Anti HCV positive cases were higher (24.8%) in Northern Punjab as compared to (23.1%) in Central and (17%) in Southern rural Punjab respectively.

**Conclusion:** This study concludes that prevalence of HCV infection is highly endemic among the rural population of Punjab and accounts for 21.6% of the studied population. The prevalence is highest in rural northern Punjab followed by the central and southern Punjab. Drivers and helpers of the farmers are the maximally infected occupations. It is recommended to plan and implement a population based hepatitis awareness and screening campaign for the affected and general population.

**Key Words:** HCV, Chronic liver complications, Cirrhosis of liver, Anti HCV antibodies.

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Date of Submission: 22-03-2017

Date of Acceptance for Publication: 05-04-2017

Conflict of Interest: None

Funding Source: None

## Contribution

All Authors have contributed in Study Design, Data Collection, Data Analysis, Data Interpretation, Manuscript Writing and Approval.

## Introduction

Viral hepatitis is a very serious threat to the public health authorities of the developing countries in particular and developed nations in general. The transmission of hepatitis C is through direct or indirect contact of infected blood and blood related products. However vertical and sexual transmission is also reported.<sup>1</sup> Despite of the modern screening tools, the infection by Hepatitis C virus is one of the most frequent blood

born infection associated with high morbidity and mortality.<sup>2</sup> Globally It is estimated that HCV prevalence is around 2% to 3%. The magnitude of the problem is far high however it is estimated that it ranges between 123 million to 170 million people infected with HCV worldwide.<sup>3</sup> There is an extensive variation about the prevalence of HCV in different regions of a country and internationally. A high prevalence is reported in central Asia and east followed by Middle Eastern and North African countries.<sup>3</sup>

The infection by Hepatitis C virus is endemic in Pakistan.<sup>4</sup> Various studies had reported different levels of sero prevalence with an ascending trends in recent years. A study conducted in 2015 concluded 22.68% prevalence of HCV in Faisalabad region.<sup>5</sup> Another study in the same region conducted in a free eye camp has reported 47.4% seropositivity.<sup>6</sup> The prevalence of HCV in Islamabad, the capital territory of Pakistan has been reported to be 33%<sup>7</sup> whereas in a study conducted at rural and periurban areas of Sindh, the reported prevalence HCV was 28.6%.<sup>8</sup> A Kashmir based study had reported 7.5% prevalence of HCV seropositivity.<sup>9</sup>

The infection by Hepatitis C Virus is among the most disturbing disaster related to public health and different communities of Pakistan.<sup>10</sup> It is considered as a fulminating cause of chronic liver complications. Hepatic cirrhosis or hepatic carcinoma is predicted to be developed among one third of the infected patients with HCV Infection.<sup>11</sup> Annually there are 350,000 deaths attributed due to hepatitis C and its associated causes.<sup>12</sup> The worst issue related with this infection is the asymptomatic condition which results worldwide due to non awareness of the patient. On the other side the regular fluctuation in the enzymes of liver results due to hepatic injury. HCV infection is more prevalent in developing countries as compared to developed nations. This may be due to the lack of health care infrastructure, services delivery, high cost and affordability of the patients. Similarly due to the lack of awareness regarding transmission process of the virus, compromised health behavior of the society and poor functioning of the health care systems has an additive effect in the ever increasing incidence and prevalence of hepatitis C infection.

The most important public health concern for the prevention and treatment of any disease is to find out the prevalence and look into the causation and transmission factors. Next step is to study the modifiable factors among different categories of the society and adopt preventive measures accordingly. Keeping in view the above mentioned scenario this study was

designed to conclude the HCV infection prevalence of in rural Punjab with a special focus on the population from low socioeconomic status.

## Methodology

Descriptive epidemiological cross sectional study was conducted from July 2013 to June 2015 in Punjab Pakistan. The province of Punjab was divided into three zones namely Central, Southern and Northern zone. Three districts from each zone were sampled and later on three villages from each district were selected. Probability based sampling technique was used and a total sample of 2400 participants was taken with 800 from each zone of Punjab. All adult males willing to participate were included in the study whereas females, children, old age above 60 years and persons having any health problem were excluded from the study. The operational definition for the prevalence of HCV in endemic scale is presented as under;

- Prevalence rate > 8% = Highly endemic
- Prevalence rate 2 – 8% = Intermediate endemic
- Prevalence rate < 2% = Low endemic

HCV screening tests were carried out by the trained staff and standard procedure was observed. The scientific protocol for blood collection, storage and processing was also ensured. All the serum samples were screened by the use of Immuno-chromatographic test kit (ICT: ACON®, ACON Laboratories Inc., San Diego, CA, USA) for Anti HCV antibodies. Data was collected in a systematic way and organized properly. The organized data was entered into the version 21 of Statistical Package of Social Sciences (SPSS) and later on analyzed by the use of statistical tools.

## Results

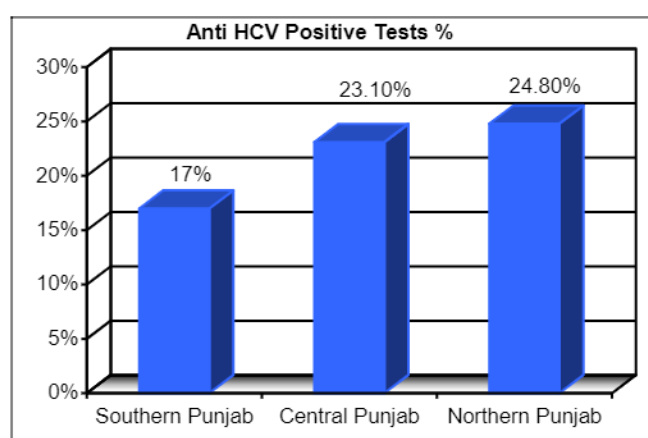
A total of 2400 subjects from three zones of Punjab participated in this study. The screening tests for Anti HCV Anti bodies were conducted for these 2400 participants. The summary of results is presented in table 1. Out of these 2400 participants the results as presented in table 1 represent that 520 (21.6%) were positive for Anti HCV where as 1880 (78.4%) were negative for Anti HCV. The results presented in figure 1 show that Anti HCV positive case are high (24.8%) in Northern Punjab as compared to (23.1%) in Central and (17%) in Southern rural Punjab respectively.

The result of different categories of participants is

**Table 1:** Prevalence of Anti HCV antibodies in the studied rural population of Punjab.

| Categories of Study Participants | Punjab          |                                 |                |                                   |                 |                                   |              |                                   |
|----------------------------------|-----------------|---------------------------------|----------------|-----------------------------------|-----------------|-----------------------------------|--------------|-----------------------------------|
|                                  | Southern Punjab |                                 | Central Punjab |                                   | Northern Punjab |                                   | Total        |                                   |
|                                  | HCV Tested      | HCV + Cases                     | HCV Tested     | HCV+ Cases                        | HCV Tested      | HCV+ Cases                        | Total Tested | Total HCV+ %                      |
| Bus Drivers & Conductors         | 100             | 15                              | 100            | 28                                | 100             | 34                                | 300          | 77<br>25.6 <sup>a</sup> %         |
| Truck Drivers                    | 100             | 34                              | 100            | 46                                | 100             | 52                                | 300          | 132<br>44.0 <sup>b</sup> %        |
| Shopkeepers & Employees          | 100             | 5                               | 100            | 3                                 | 100             | 7                                 | 300          | 15<br>5.0 <sup>c</sup> %          |
| Riksha Driver                    | 100             | 9                               | 100            | 13                                | 100             | 25                                | 300          | 47<br>15.6 <sup>b</sup> %         |
| Donkey-Cart Drivers              | 100             | 11                              | 100            | 17                                | 100             | 6                                 | 300          | 34<br>11.3 <sup>b</sup> %         |
| Handcart Puller Fruit/Vegetable  | 100             | 4                               | 100            | 18                                | 100             | 3                                 | 300          | 25<br>8.3 <sup>c</sup> %          |
| Helpers of Farmers               | 100             | 37                              | 100            | 45                                | 100             | 65                                | 300          | 147<br>49.0 <sup>b</sup> %        |
| Farmers                          | 100             | 21                              | 100            | 15                                | 100             | 7                                 | 300          | 43<br>14.3 <sup>c</sup> %         |
| <b>Total</b>                     | <b>800</b>      | <b>136<br/>17<sup>b</sup> %</b> | <b>800</b>     | <b>185<br/>23.1<sup>a</sup> %</b> | <b>800</b>      | <b>199<br/>24.8<sup>a</sup> %</b> | <b>2400</b>  | <b>520<br/>21.6<sup>a</sup> %</b> |

The different (a, b, c) superscripts show a statistically significant difference of an  $\alpha$  level of 0.05%.

**Fig. 1:** Comparison of Anti HCV prevalence in different zones of Punjab.

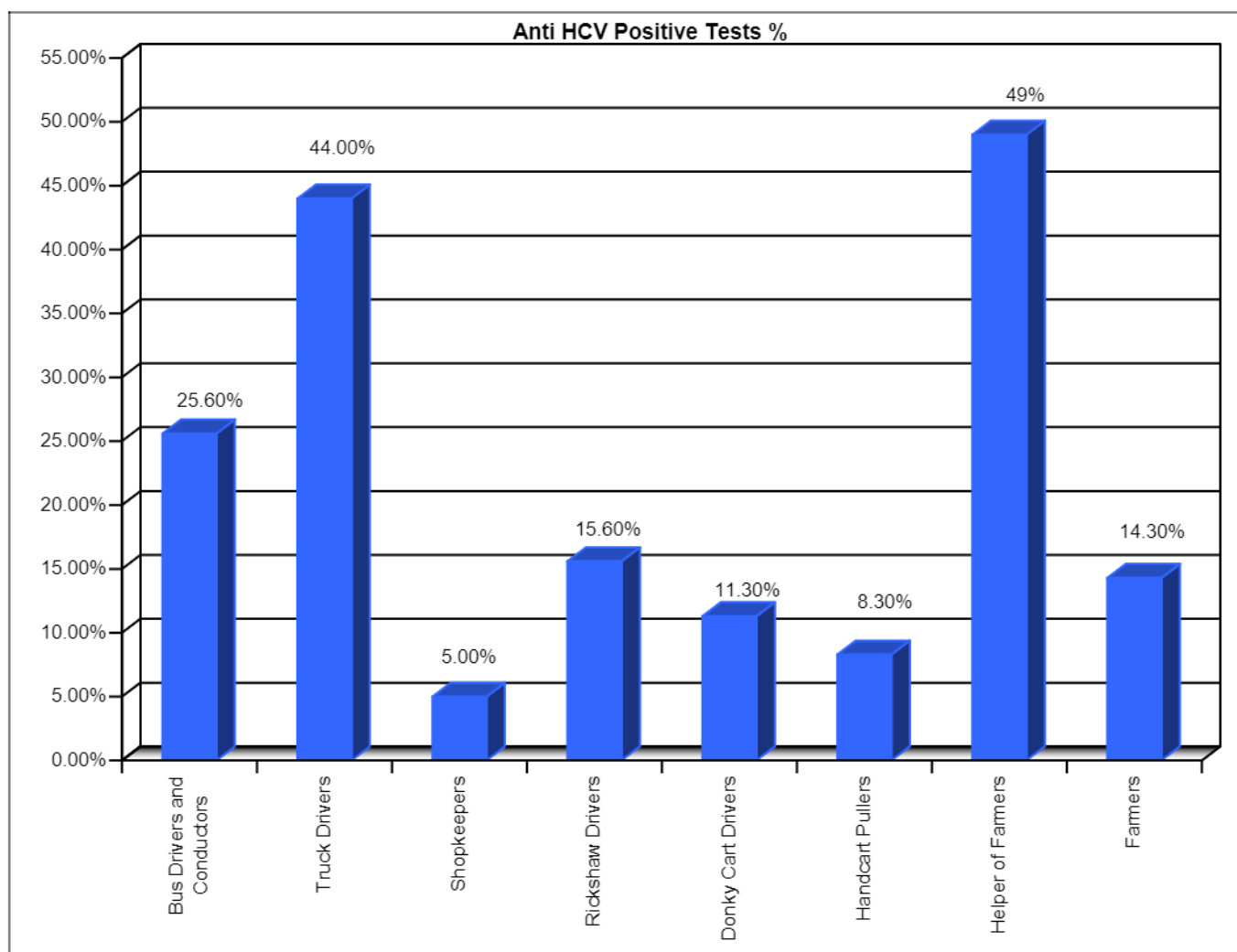
presented in figure 2. It represent a very interesting result of different professional categories. Highest

positive percentage (49%) is among helpers of farmers followed by (44%) in truck drivers and (25.6%) in bus drivers & conductors. The lowest positive percentage (5.09%) is concluded in shopkeepers.

## Discussion

This epidemiological study was conducted to find out the prevalence of anti HCV antibodies in rural Punjab Pakistan. A total of 2400 participants from three different zones, Southern, Central and Northern Punjab were screened for Anti HCV antibodies. These participants were included from nine different districts focusing the rural areas. Different categories including Bus drivers, Truck drivers, shopkeepers, Rikshaw drivers, Donkey-cart drivers, Handcart pullers, Helpers of farmers and farmers were screened to find out the prevalence of Anti HCV. This study is unique due to the





**Fig.2:** Comparison of Anti HCV Prevalence among Different Categories.

versatile participation from various occupations. The cumulative prevalence of Anti HCV as presented in Table 1 is 21.6%. This result is in line with the finding of another study conducted in Faisalabad during the year of 2015.<sup>5</sup> However this result is contrary to the finding of another study published in 2013 which concluded the prevalence as 47.4%.<sup>6</sup> But this study was not population based rather it was conducted in a free eye camp where primarily the patients came for cataract surgery and screened for Anti HCV antibodies as well. It is important to mention that 21.6% is very high prevalence reflecting that every 5th person in the population of Punjab is positive for HCV. The regional variation of the results indicate that highest prevalence (24.8%) is in the northern Punjab followed by the central Punjab (23.1%) and Southern Punjab (17%) respectively. This variation among different regions need

further investigation to find out the associated factors for high prevalence.

The results of Anti HCV positivity among different occupations presented in figure 2 represent that prevalence is very high (49%) among the helpers of farmers followed by truck drivers (44%). These results are very alarming and quite different from another study conducted on the long distance truck drivers of Brazil concluding a prevalence of HCV infection as (1.4%) only.<sup>13</sup> Similarly the results regarding three different categories of drivers including truck, bus and rickshaw are very dangerous. The total prevalence of drivers is 85.2% among the study population. The prevalence among the helpers of farmers (49%) found in this study is also a disaster and need immediate attention.

## Conclusion

The finding of this study conclude that prevalence of HCV infection is highly endemic among the rural population of Punjab and accounts for 21.6% of the studied population. According to the results of this study every 5th person is infected with HCV with highest prevalence in Northern Punjab followed by the Central and Southern Rural Punjab. Drivers and helpers of the farmers are the maximally infected occupations. The findings of the study are distressing and need immediate attention of the relevant authorities. It is recommended to plan and implement a population based hepatitis awareness and screening campaign for the affected and general population. More over a health education campaign is also desired to compete with the disastrous conditions.

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