

Sero-Prevalence of HCV Antibodies in Population Attending Madina Teaching Hospital, Faisalabad

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In the recent years, infection with hepatitis C virus (HCV) has emerged as one of the common causes of acute and chronic liver disease world over including Pakistan. In the suburbs of the cities and in far flung areas, quacks and barbers frequently use un-sterilized instruments which are a major potential source of spreading HCV infection in the sub-urban population of Pakistan.

Background: This is a descriptive study carried out to determine the frequency of hepatitis C virus (HCV) infection, in the population of Faisalabad, Pakistan.

Study design: A descriptive study.

Place and Duration: This study was performed in the department of clinical pathology of Madina Teaching Hospital, Faisalabad from May 2005 to April 2007.

Methods: Blood specimens of all subjects were collected and tested for Anti-HCV.

Results: Seroprevalence of Hepatitis C virus (HCV) among hospital based general population was determined. The study population comprised of 3094 individuals attending a tertiary care hospital in Faisalabad, Pakistan. The overall seroprevalence was found to be 17.77%. The seroprevalence in males and females was 16.45% and 19.13% respectively. There was no statistically significant difference in the proportion of individuals who were positive in case of males and females ($p > 0.05$). This study also shows higher prevalence rate of HCV infection in the older age group (≥ 50).

Conclusion: This study clearly demonstrated a high carrier state of clinically silent HCV infection.

Keywords: Seroprevalence, Hepatitis C, Anti-HCV, Chronic hepatitis, Madina Teaching Hospital, Faisalabad.

Hepatitis may be produced by many viruses and other infectious agents that are capable of infecting the hepatocytes leading to inflammation of the liver and jaundice. In the recent years, infection with hepatitis C virus (HCV) has emerged as one of the common causes of acute and chronic liver disease world over.¹⁻³

Hepatitis C virus is a member of the Flaviviridae family and is a single, positive-stranded RNA virus of approximately 10,000 nucleotides. HCV is a blood-borne virus and per cutaneous, per mucosa and perinatal routes of transmission are well documented but many patients report no recognizable source of infection.^{3,4} The prevalence of HCV infection varies throughout the world and has been reported highest in Egypt.⁵ WHO estimates that upto 3.0 % of the world's population has been infected with HCV and worldwide there are more than 170 million chronic carriers of HCV.¹⁻³

Hepatitis C virus is predominantly transmitted parentally and causes hepatic inflammation. Usually acute HCV infection passes un-noticed and majority of the persons remain asymptomatic or have mild symptoms.^{2,5,6} Individuals positive for HCV antibody are potentially infectious and 60-85% of them become chronically infected with the virus whereas 10-20% of them may develop cirrhosis and 1-5% may develop hepato-cellular carcinoma in 20-30 years time.^{2,5-7}

HCV is diagnosed serologically by detecting antibodies specific to the HCV (Anti-HCV) and by ruling out other

viruses such as HAV or HBV. Anti-HCV testing does not differentiate between an acute, chronic or resolved infection. A supplement test can also be used to confirm or refute a positive anti-HCV result.¹ Nevertheless, current anti-HCV assays have been very effective for screening general population before blood donation or planned surgery. Anti-HCV is not a protective antibody and in patients with acute or chronic hepatitis, the presence of anti-HCV in serum generally signifies that HCV is the cause.

Hepatitis C is also common in Pakistan but accurate epidemiological information is quite limited. In the suburbs of the cities and in far flung areas, quacks (non-qualified medical and dental practitioners, lady health visitors, mid wives and dais) and barbers frequently use un-sterilized instruments which are a major potential source of spreading HCV infection in the urban and sub-urban population of Pakistan.

The present study was conducted to evaluate the seropositivity of HCV in both sexes and different age groups in the population, reporting to Madina Teaching Hospital, a newly established tertiary care hospital in Faisalabad.

Aims and Objectives

Present study was undertaken:

1. To evaluate the frequency of HCV infection in the randomly selected population presenting to Madina Teaching Hospital, Faisalabad.

- To assess the prevalence rate of HCV infection in the different age groups and any sex differentiation in the prevalence of HCV infection in this population.

Subjects and Methods

This study was conducted at Madina Teaching Hospital, Faisalabad for a period of two years from May 2005 to April 2007. Randomly selected hospital population was screened for Anti-HCV along with other routine tests and includes subjects of both sexes and of all ages. All subjects were subdivided into four groups according to their age and sex. Sterile disposable syringes were used to collect blood specimens. Sera were separated and preserved for analysis.

Immunoassays

Anti-HCV immuno-chromatographic kits/devices were used to screen all blood specimens. The results were recorded as 'Reactive or Non- Reactive.' The results of 200 randomly selected reactive and non-reactive sera were subjected to cross check using ELISA tests, and were confirmed.

Table 1: % age of sex wise distribution of Anti-HCV +ve and -ve cases.

Subjects		Anti -HCV +ve cases		Anti -HCV -ve cases	
Sex	Total No.	No.	% age	No.	% age
Male	1568	258	16.45%	1310	83.54 %
Female	1526	292	19.13%	1234	80.86%
Total	3094	550	17.77%	2544	82.22%

Table 2: % age distribution of Hepatitis C +ve cases in different age groups.

Age Group	Age (Years)	Total Subjects Screened	HCV +ve Subjects	% age
Group I	up to 19	335	18	5.37
Group II	20 - 39	804	154	19.15
Group III	40 - 49	747	142	19.00
Group IV	50 - 59	1208	236	19.53

Table 3: % age sex distribution of Anti -HCV +ve cases.

Age	Total subjects	Male subjects	C +ve cases	Female subjects	C +ve cases
Group I	335	204	10 (4.90 %)	131	8 (6.10%)
Group II	804	405	73 (17.80 %)	399	81 (20.30%)
Group III	747	329	58 (17.62%)	418	84 (20.00%)
Group IV	1208	630	117 (18.57%)	578	119 (20.58%)
Total	3094	1568	258 (16.45%)	1526	292 (19.13%)

Statistical analysis

Data was analyzed using SPSS version 12.0. Chi-square test was applied for qualitative variables - to check the relationship of HCV with age. Percentages were calculated directly for HCV in different age groups. Statistical significance was accepted for $P < 0.05$ (significant) and $P > 0.05$ (insignificant).

Results

A total of 3094 subjects including 1568 males and 1526 females were screened for hepatitis C and the carrier state of HCV was detected in 550 (17.77%) of the subjects. 50.67% of the subjects were males (Table I). There was no statistically significant difference regarding infection rate in age groups II, III and IV ($P > 0.05$) but all these groups were significantly different from group I ($P < 0.001$) (Table 2). Exposure to HCV infection was highest in those over the age of 50 years (19.53%) and lowest in those under the age of 20 years (5.37%) (Table 2). Table 3 shows that 258 (16.45%) males and 292 (19.13%) females were seropositive for HCV and the difference in the sex distribution is quite insignificant ($P > 0.05$). The only significant risk factors for HCV exposure were a previous history of parenteral therapy and increasing age.

DISCUSSION

In the present study, the seroprevalence of HCV among hospital-based population was found to be 17.77 %. Many studies have been conducted world wide on different population groups to detect HCV antibodies in the blood (anti-HCV). Most of the studies were carried out on blood donors. The prevalence was found to be very low in healthy blood donors as compared to professional and paid donors. The prevalence rates in healthy blood donors are 0.01-0.02% in the UK and Northern Europe, 1.0-1.5% in Southern Europe and 6.5% in parts of equatorial Africa.^{3,7,8} In Egypt, the HCV prevalence rate was 27% in paid professional blood donors and 17% in non-paid blood donors.⁷ In 2000, Frank et al. reported that Egypt has the highest number of reported HCV infections with a mean prevalence of 22%.⁵ Bhattacharya et al reported a prevalence rate of 4.8% of HCV antibodies in a study carried out in hospital based population in South India.⁸ Another study from India reported a HCV prevalence rate of 4.28% in clinically diagnosed cases of hepatitis.⁹ In USA, hepatitis C infection is one of the major blood-borne diseases and a leading cause of chronic hepatitis and about 12000 individuals die each year from HCV associated chronic liver disease.^{2,5,6} In USA, the annual number of newly acquired acute HCV

infection has declined from an estimated 240,000 in mid-1980s to about 25,000 in 2001. And in terms of prevalence, about 3.9 million Americans (1.8%) have been infected with the HCV (2.7 million chronically infected).^{2,5,6} HCV is now the leading cause of liver transplantation, in US.^{7,8}

According to various studies, persistent endemic state of HCV infection within a community particularly in developing countries, can be due to medical injections and improperly sterilized surgical instruments.^{3,4,9} The prevalence seems to increase with age because of the continuing risk of exposure or a cohort effect with declining risk in more recent times.⁸⁻¹⁰

According to the reports of World Health Organization (WHO), viral hepatitis has become a disease of greater health concern worldwide including Pakistan and WHO reports that upto 3.0 % world's population has been infected with the "Hepatitis C Virus (HCV)" and that there may be more than 170 million chronic carriers of HCV globally.^{2,3,5} But accurate epidemiological information for chronic HCV infection is quite insufficient from Pakistan.

Limited studies are available to have a clear picture of prevalence of hepatitis C at the national level in our country. In any seroprevalence estimation, the appropriate study cohort would probably be a sample from the general population as the disease is not limited to a small geographical, social or socio-economic group. Most studies revolve mainly around blood banks and blood donors are usually young adults, predominantly males, hence seroprevalence in females and other age groups, like children and aged cannot be estimated.

Various small scale studies show wide variations ranging from 1.8% to 6.0%.¹¹⁻¹⁷ According to these estimates, about 12 million population of Pakistan is sero-positive for HCV that is equivalent to 4%. Most of these apparently healthy individuals are unaware of their disease whereas some of them are suffering from chronic liver disease. These individuals are a constant source of infection to their families and community. No specific post exposure therapy is available for chronic viral hepatitis C disease. Also, currently no prophylactic vaccine is available for HCV infection or any short term prevention such as for HBsAg or immunoglobulin.¹ In the absence of the above, all possible preventive measures should be adopted.

Conclusion

In the given set of population, this study concludes that seropositivity is alarmingly high in the catchments area of this Faisalabad hospital. In terms of prevalence, figure of 17.77% of HCV infection is quite alarming and eye awakening for the 'Health Authorities' in view of the potential hazards and silent nature of the disease. According to this figure, about 1/5th population of Faisalabad is sick and majority of them is unaware of their illness. The high frequency of this disease compels us to launch major public health

awareness programs and to adopt prophylactic measures to curb its spread.

References

1. Strader DB, Wright T, Thomas DL, Seeff LB: Diagnosis, management, and treatment of hepatitis C. *Hepatology* 2004 Apr; 39 (4): 1147-71.
2. Armstrong GL, Alert MJ, McQuillan GM, Margolis HS. The past incidence of hepatitis C virus infection: implications for the future burden of chronic liver disease in the United States. *Hepatology* 2000; 31: 777-82.
3. Frank C, Mohamed MK, Strickland GT, Lavanchy D, Arthur RR, Magder LS, et al: The role of parenteral antischistosomal therapy in the spread of hepatitis C virus in Egypt. *Lancet* 2000; 11; 355 (9207): 887-91.
4. Gerberding JL. The infected health care providers. *N Engl J Med* 1996; 334: 594-5.
5. Davis GL, Albright JE, Cook SF, Rosenberg DM: Projecting future complications of chronic hepatitis C in the United States. *Liver Transpl* 2003 Apr; 9 (4): 331-8.
6. Brown RS, Gaglio PJ. Scope of worldwide hepatitis C problem. *Liver Transplantation* 2003; 9 (Suppl 3): S 10-13.
7. Attia M. H., Zekri A. B., Goudsmit J., Boom R, Khaled HM, Mansour MT, et al. Diverse pattern of recognition of hepatitis C virus core and non-structural antigens by antibodies present in Egyptian cancer patients and blood donors. *J of Clin Microbiology*, 1996; 2665-69.
8. Bhattacharya S, Badrinath S, Hamide A, Sujatha S. Seroprevalence of hepatitis C virus in a hospital based general population in South India. *Ind J Med Microbiol* 2003; 21 (1): 43-45.
9. Arora DR, Sehgal R, Gupta N, Yadav A, Mishra N, Siwach SB Prevalence of parenterally transmitted hepatitis viruses in clinically diagnosed cases of hepatitis. *Indian J Med Microbiol* 2005; 23: 44-47.
10. Sampietro M, Caputo L, Annoni G, Corbetta N, Ticozzi A, Fiorelli G, et al; High prevalence of clinically silent HCV infection in older people. *J Am Geriatr Soc* 1998; 46: 1057-58.
11. Lone DS, Aman, S, Aslam M; Prevalence of Hepatitis C Virus Antibody in Blood Donors of Lahore: *Biomedica*, 1999; 15: 103-07.
12. Anwar MS, Bokhari SR, Bokhari SR; Prevalence of Anti-HCV antibodies in Patients with Suspected Liver Disease: *Biomedica*; 1999, 15: 80-84.
13. Khattak MF, Salamat N, Bhatti FA, Qureshi TZ; Seroprevalence of Hepatitis B, C & HIV in blood donors in Northern Pakistan. *J Pak Med assoc* 2002; 52 (9): 398-402.

14. Shamim M, Memood R, Muhammad M, Masood H, Wasim I; Frequency of seropositive blood donors for Hepatitis B,C and HIV viruses in Railway Hospital, Rawalpindi. Pak J Med Res 2004; 41 (2): 51-53.
15. Chaudry NT, Jameel W, Ihsan I, Nasreen S; Hepatitis C: Professional Med J; 2005; 12 (4): 364-367.
16. Aziz MS; Prevalence of Anti-Hepatitis C Antibodies and Hepatitis B Surface Antigen in Healthy Blood Donors in Baltistan: Pak Armed Forces Med J 2006; 56 (2): 189-191.
17. Ijaz AU, Shafiq F, Toosi NA, Malik MN, Qadeer R; Hepatitis B and Hepatitis C in Blood Donors: Analysis of 2 years data: Annals, 2007; 13; 59-61.