ISSN (Print): 2663-9491 ISSN (Online): 2789-6897

Original Article

Prevalence of Anti-HCV Seropositivity among Dialysis Patients in Bangladesh

DOI: dx.doi.org

Ashish Kumar Chakrabarty[1], Aiyub Al Mamun[2], Mamun Al Mahtab Swapnil[3], Arun Joyoti Tarafdar[4]

Received: 11 June 2023
Accepted: 25 June 2023
Published: 10 August 2023

Published by:
Sher-E-Bangla Medical College, Barishal, Bangladesh

ABSTRACT

Background: *HCV is the primary cause of acute and chronic hepatitis, liver cirrhosis, hepatocellular carcinoma, and related fatalities. HCV transmission in industrialized nations is associated with drug use, while healthcare-associated transmission is the primary mode of transmission in underdeveloped nations. Risk factors for dialysis patients include transfusions, dialysis duration, IV drug use, and kidney transplant history.* ***Objective:*** *This study aimed to establish the prevalence of HCV in HD patients in Bangladesh and identify the primary risk factors for virus transmission among this population.* ***Methods:*** *From July 2021 to June 2022, 380 patients at BIRDEM hospital and BSMMU in Dhaka, Bangladesh were studied cross-sectionally. Adults were studied. For proper data collection and interpretation, hemodialys is patients completed a thorough multiple-choice questionnaire. 5 ml of blood was collected in tubes, clotted at room temperature, and centrifuged. Serum anti-HCV ELISA testing followed. Rapid anti-HCV kit levels were measured.* ***Results:*** *There was no significant association between Anti-HCV seropositivity and age or gender, with odds ratios of 1.0 and p-values of 0.624 and 0.963, respectively. There were significant associations with risk factors including a history of jaundice, previous surgeries, circumcision in males, needle-stick injuries, ear-nose-body piercing in females, and visiting a community barber for shaving in males. No significant correlation was found between visiting unregistered healthcare facilities (OR 0.9; p=0.098).*

(The Planet 2022; 6(2): 344-350)

1. *Consultant Hepatology, BIRDEM General Hospital, Dhaka, Bangladesh*
2. *Chairman, Department of Hepatology, Bangabandhu Sheikh Mujib Medical University Hospital, Dhaka, Bangladesh*
3. *Chairman, Department of Interventional Hepatology, Bangabandhu Sheikh Mujib Medical University Hospital, Dhaka, Bangladesh*
4. *Associate Professor, Department of Hepatology, Mymensingh Medical College, Mymensingh, Bangladesh.*

Conclusion: *This study suggests a noteworthy occurrence of anti-HCV sero-positivity among hemodialysis patients in Dhaka. Diverse lifestyles increase the likelihood of testing positive for anti-HCV.*

Keywords: *Hepatitis, HCV, Seropositivity*

INTRODUCTION

Acute hepatitis symptoms can linger for years after an initial infection with the hepatitis C virus (HCV), making it one of the primary causes of both acute and chronic hepatitis. Liver cirrhosis, hepatocellular cancer, and mortality are all caused by this virus [1,2]. More than 71 million people have a viremic infection from HCV; sero prevalence rates vary from 3%–4% in Asian nations to 10%–20% in central Africa and Egypt, suggesting that as much as 1% of the global population may be infected with HCV [3,4]. Poor infection control and a lack of preventive measures in healthcare institutions in underdeveloped countries make injection medication use the most common route of HCV transmission, despite the fact that this is a major risk factor for obtaining HCV [5,6].

Hepatitis C virus (HCV) infection has been found to be common in patients undergoing renal replacement therapy for the past 25 years [7,8]. It has been established that HCV infection is a leading contributor to poor health and mortality rates in this population [9]. Risk factors for HCV in dialysis patients include receiving blood transfusions, having a long history of dialysis, using intravenous drugs, and having a history of kidney transplantation. The risk associated with dialysis averages 2-4% worldwide. Transmission of HCV in healthcare settings may be prevented through the implementation of methods to reduce the spread of blood-borne viruses[10].

HCV transmission among hemodialysis (HD) patients and its potential routes of spread were studied in the 1990s [11]. There were fewer reports of HD patients contracting HCV in the early 2000s, according to a number of studies [12]. Surprisingly, in the years after then, very little has been published about the epidemiology of HCV among dialysis patients. One large study gathered data from East Asia and Oceania obtained before to 2006 [13].

Hepatitis C virus (HCV) prevalence in Bangladesh is poorly understood. HCV risk factors in Bangladesh include vaccinations for smallpox, cholera, dental work, intravenous infusions, and other procedures. Quack medicine, barbershop haircuts and shaves, body piercing, etc. fall within this category [14]. More than 70 percent of people infected with HCV are men. After hepatitis B virus (HBV), hepatitis C virus (HCV) is the major cause of CLD in Bangladesh, responsible for 30% of cases of liver cirrhosis and 17% of cases of HCC. In Bangladesh, about 60% of HCV-infected persons are under the age of 50. Our shared history and culture includes the use of unlicensed village doctors, the shave at the barbershop, traditional circumcision by "hajams," and the piercing of female ears and noses. These traditions would last for generations in Bangladesh. There is evidence linking certain racial and cultural characteristics to an increased risk of contracting HCV [15]. This is the first article that we are aware of that examines the prevalence of hepatitis C viruses in the

Dhaka, Bangladesh hemodialys is population.

OBJECTIVES

The purpose of this study was to assess the prevalence of HCV among Bangladeshi hemodialys is patients and to identify the most important risk factors for the spread of HCV among HD populations.

METHODS & MATERIAL

The Department of Hepatology and the Internal Medicine Service at BSMMU & BIRDEM in Dhaka, Bangladesh, conducted a cross-sectional study between July 2021 and June 2022, including 380 patients. Adults were eligible to take part in the study. The institutional review board (IRB), a subcommittee of BIRDEM, was presented with and gave its blessing to the study's guiding concepts and procedures. To ensure precise data collection and limit ambiguity, a lengthy multiple-choice questionnaire was administered to all hemodialys is patients. After receiving written informed consent, we used pilot-tested questionnaires to collect the necessary medical and socio-demographic data. Tubes were used to collect 5 ml of blood, which was then centrifuged after clotting at room temperature. Anti-HCV ELISA kits were quickly used to evaluate the serum. Anti-HCV antibody titers were measured using the RIBA rapid anti-HCV test. To rule out the possibility of HCV infection, those samples that showed no reaction were considered negative; those that showed a reaction were retested, and those that showed a reaction both times were considered positive.

Statistical analysis

Before running any statistical analysis on the data, we carefully examined everything. We used SPSS for Windows, version 23.0. The average and percentage of socioeconomic and clinical characteristics were calculated for anti-HCV sero positive groups. Sero positive for anti-HCV was used as the dependent variable in univariate and multivariate analyses, with demographic and clinical factors like age, sex, education level, dialysis duration in months at first dialysis ever, surgical history, and blood transfusions serving as the independent variables. Statistical significance was assumed when the P value was less than 0.05.

RESULTS

Anti-HCV was present in 47 patients (12.4%) out of a total of 380 included in the research. Of the total 380 participants, 63.9% were male and 36.1% were female. Patients joined at the highest rates after the age of 38, with 35.3% in the 38-47 age range, 28.7% in the 48-57 age range, and 18.7% in the 58+ age range. People aged 58 and up showed a significant incidence of anti-HCV. Total population blood transfusions were 4.87, while anti-HCV transfusions were 6.63. Total population hemodialys is duration was 29.3 months and anti-HCV hemodialysis duration was 52. 3 months. 53.2 percent of patients who tested positive for Anti-HCV had completed some college-level coursework. 5.2% of Muslims and 3.9% of Hindus tested positive for antibodies against hepatitis C virus (**Table I**).

Table I: Sociodemographic characteristics of Sero-HCV sero-positive hemolysis patient in BIRDEM and BMSSU

Variables	***Total patient admitted n= 380***		***Anti-HCV sero-positive n= 47***	
	n	**%**	**n**	**%**
Age				
18-27	7	1.8	2	0.5
28-37	59	15.5	5	1.3
38-47	134	35.3	13	3.4
48-57	109	28.7	11	0.3
58<	71	18.7	16	4.2
Gender				
Male	243	63.9	29	7.6
Female	137	36.1	18	4.7
Education Level				
Primary/Secondary	113	29.7	25	53.2
High school/college	210	55.3	14	3.7
Graduate/Post graduate	57	15	8	2.1
Religion				
Muslim	205	53.9	20	5.2
Hindu	128	33.6	15	3.9
Christian	29	7.6	3	0.8
Buddha	18	4.7	9	2.4
Duration of dialysis (months)	29.3		52.3	
Number of units of blood transfused	4.87		6.63	

Anti-HCV seropositivity was not significantly linked with age (OR 1.0; p=0.624) or gender (OR 1.0; p=0.963) in bivariate analysis. Jaundice (OR 1.1; p = 0.003), surgery (OR 1.5; p = 0.0234), male circumcision (OR 1.2; p=0.001), needle stick injuries (OR 1.26; p = 0.002), female ear, nose, and body piercing (OR 1.35; p 0.0368), and male visits to the community barber for shaving were all significant independent behavioral variables. Using unlicensed medical care was not associated with increased risk (OR = 0.9; p=0.098). (**Table II**).

Table II: Prevalence and risk factors of hepatitis C virus infections in the study subject using bivariate analysis

Risk factors	*Anti-HCV seropositive (n=47)*	*OR (95% CI)*	*P value*
Age	46.78 ± 15.3	1.0 (0.9–1.0)	0.624
Gender			
Male	29 (61.7)	1.0 (0.6–1.53)	0.963
Female	18 (38.3)		
History of jaundice			
Yes	10 (21.3)	1.1 (1.2–1.3)	0.003
No	37 (78.7)		
Previous surgery			
Yes	13 (27.7)	1.5 (1.9–2.1)	0.0234
No	34 (72.3)		
Circumcision in male (n=128)			
Yes	28 (59.6)	1.2 (1.1–1.3)	0.001
No	19 (40.4)		
Needle stick injury			
Yes	12 (25.5)	1.26 (1.00-1.59)	0.002
No	35 (74.5)		
Ear-Nose body piercing in female (n=18)			
Yes	17 (36.2)	1.35 (1.07-1.70)	0.0368
No	1 (2.1)		
Visiting local barber for shaving in male (n=29)			0.0138
Yes	25 (53.2)	2.79 (2.23-3.61)	
No	4 (8.5)		
Visiting unregistered health care			
Yes	20 (42.6)	0.9 (0.4–2.1)	0.098
No	27 (57.4)		

DISCUSSION

This study presents the first statistically significant data on the prevalence of anti-HCV antibodies in Bangladeshi hemodialys is patients. Previous studies measuring the prevalence of HCV across all patients or a sample of community members found a lower frequency than what was found among dialysis patients (12.4%). The prevalence of HCV in rural Bangladesh was confirmed by a study conducted in a semi-urban area of the country; 0.8% of apparently healthy people were infected with HCV. Dhaka, the capital of Bangladesh, has a very high HCV incidence (5.5% among the general population and 5.8% among non intravenous drug users [17,18]. The disparities in HCV prevalence between rural, semi-urban, and urban areas of

Bangladesh warrant immediate study. Five percent of Dhaka's population is HCV positive [19]. The frequency was much higher in India than in Bangladesh (33.5% vs. 5%), according to a recent study. [19] Pakistan has a really close match with 32.33 percent [20].

One of the other goals of this study was to develop a questionnaire to better understand the risk variables related with anti HCV sero positive in this Dhaka population. Recent surgery, male circumcision, needle injury, ear/nose piercing in females, and visits to local barbershops were found to be significant risk factors. Unauthorized medical care had no correlation with patient visits. Similarly, there is no correlation between age and gender.

A prevalence of 0.5% to 1% is alarming because of the pathogenic process and virology of HCV. In contrast, my findings show a substantially higher prevalence. Most people who become infected with HCV will eventually develop chronic liver disease and its attendant symptoms. HCV infection therapy is extremely costly and comes with serious side effects. Furthermore, unlike hepatitis B virus, HCV does not have a prophylactic vaccine. The estimated prevalence of HCV in Bangladesh is not likely to be under 1%. This is a major concern for the health of the general populace.

CONCLUSION

Overall, the results of this study show that anti-HCV seropositivity is highly prevalent among Dhaka's hemodialys is patients. Those who are anti-HCV positive are more likely to have a varied lifestyle. Establishing the genotyping of HCV infection would necessitate further study, and this new research should make use of additional PCR markers.

REFERENCES

1. *Perz JF, Armstrong GL, Farrington LA, Hutin YJ, Bell BP. The contributions of hepatitis B virus and hepatitis C virus infections to cirrhosis and primary liver cancer worldwide. Journal of hepatology. 2006 Oct 1;45(4):529-38.*
2. *Lee MH, Yang HI, Lu SN, Jen CL, You SL, Wang LY, Wang CH, Chen WJ, Chen CJ, Reveal-HCV Study Group. Chronic hepatitis C virus infection increases mortality from hepatic and extrahepatic diseases: a community-based long-term prospective study. The Journal of infectious diseases. 2012 Aug 15;206(4):469-77.*
3. *Blach S, Zeuzem S, Manns M, Altraif I, Duberg AS, Muljono DH, Waked I, Alavian SM, Lee MH, Negro F, Abaalkhail F. Global prevalence and genotype distribution of hepatitis C virus infection in 2015: a modelling study. The lancet Gastroenterology & hepatology. 2017 Mar 1;2(3):161-76.*
4. *Abdel-Hamid M, El-Daly M, Molnegren V, El-Kafrawy S, Abdel-Latif S, Esmat G, Strickland GT, Loffredo C, Albert J, Widell A. Genetic diversity in hepatitis C virus in Egypt and possible association with hepatocellular carcinoma. Journal of general virology. 2007 May;88(5):1526-31.*
5. *Blach S, Zeuzem S, Manns M, Altraif I, Duberg AS, Muljono DH, Waked I, Alavian SM, Lee MH, Negro F, Abaalkhail F. Global prevalence and genotype distribution of hepatitis C virus infection in 2015: a modelling study. The lancet Gastroenterology & hepatology. 2017 Mar 1;2(3):161-76.*
6. *Lanini S, Easterbrook PJ, Zumla A, Ippolito G. Hepatitis C: global epidemiology and strategies for control. Clinical Microbiology and Infection. 2016 Oct 1;22(10):833-8.*
7. *Roth D, Fernandez JA, Burke GW, Esquenazi V, Miller J. Detection of antibody to hepatitis C virus in renal*

transplant recipients. Transplantation. 1991 Feb 1;51(2):396-400.

8. *Fabrizi F, Raffaele L, Bacchini G, Guarnori I, Pontoriero G, Erba G, Locatelli F. Antibodies to hepatitis C virus (HCV) and transaminase concentration in chronic haemodialysis patients: a study with second-generation assays. Nephrology Dialysis Transplantation. 1993 Jan 1;8(8):744-7.*
9. *Goodkin DA, Bieber B, Jadoul M, Martin P, Kanda E, Pisoni RL. Mortality, hospitalization, and quality of life among patients with hepatitis C infection on hemodialysis. Clinical Journal of the American Society of Nephrology. 2017 Feb 7;12(2):287-97.*
10. *Beck L, Bomback AS, Choi MJ, Holzman LB, Langford C, Mariani LH, Somers MJ, Trachtman H, Waldman M. KDOQI US commentary on the 2012 KDIGO clinical practice guideline for glomerulonephritis. American Journal of Kidney Diseases. 2013 Sep 1;62(3):403-41.*
11. *Jadoul M. Transmission routes of HCV infection in dialysis. Nephrology Dialysis Transplantation. 1996 Jan 1;11(supp4):36-8.*
12. *Jadoul M. Transmission routes of HCV infection in dialysis. Nephrology Dialysis Transplantation. 1996 Jan 1;11(supp4):36-8.*
13. *Johnson DW, Dent H, Yao Q, Tranaeus A, Huang CC, Han DS, Jha V, Wang T, Kawaguchi Y, Qian J. Frequencies of hepatitis B and C infections among haemodialysis and peritoneal dialysis patients in Asia-Pacific countries: analysis of registry data. Nephrology Dialysis Transplantation. 2009 May 1;24(5):1598-603.*
14. *El-Raziky MS, El-Hawary M, Esmat G, Abouzied AM, El-Koofy N, Mohsen N, Mansour S, Shaheen A, Hamid MA, El-Karaksy H. Prevalence and risk factors of asymptomatic hepatitis C virus infection in Egyptian children. World journal of gastroenterology: WJG. 2007 Mar 3;13(12):1828.*
15. *El-Raziky MS, El-Hawary M, Esmat G, Abouzied AM, El-Koofy N, Mohsen N, Mansour S, Shaheen A, Hamid MA, El-Karaksy H. Prevalence and risk factors of asymptomatic hepatitis C virus infection in Egyptian children. World journal of gastroenterology: WJG. 2007 Mar 3;13(12):1828.*
16. *Khan, M., Mustafa, M., Ahmad, N., Alam, M., Baig, R.H., Chowdhry, Z.R. and Ahmed, M., 2010. Seroprevalence of hepatitis C virus in rural population of Bangladesh. Indian Journal of Gastroenterology, 29(1), pp.44-45.*
17. *Akbar, S.F., Hossain, M., Hossain, M.F., Sarker, S., Hossain, S.S., Tanimoto, K., Masumoto, T., Michitaka, K., Horiike, N. and Onji, M., 1997. Seroepidemiolgy of hepatitis viruses of chronic liver diseases in Bangladesh: high prevalence of HCV among blood donors and healthy person. Hepatology Research, 7(2), pp.113-120.*
18. *Shirin T, Ahmed T, Iqbal A, Islam M, Islam MN. Prevalence and risk factors of hepatitis B virus, hepatitis C virus, and human immunodeficiency virus infections among drug addicts in Bangladesh. Journal of Health, Population and Nutrition. 2000 Dec 1:145-50.*
19. *Soin, D., Grover, P. and Malhotra, R., 2015. Hepatitis C virus infection in dialysis patients: a retrospective study from a tertiary care hospital of North India. International Journal of Research and Development in Pharmacy & Life Sciences, 4(3), pp.1529-1532.*
20. *Akhtar, S., Nasir, J.A., Usman, M., Sarwar, A., Majeed, R. and Billah, B., 2020. The prevalence of hepatitis C virus in hemodialysis patients in Pakistan: A systematic review and meta-analysis. PloS one, 15(5), p.e0232931.*