

Prevalence of hepatitis B, hepatitis C and human immunodeficiency virus infection among hemodialysis patients in a tertiary health care center of Western Rajasthan

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ABSTRACT

Background: Infections such as viral hepatitis (both B and C) and human immunodeficiency virus (HIV) have major role in morbidity and mortality in hemodialysis (HD) patients. It is important to know the prevalence of these infections in HD patients to encounter medical challenges. Not much work has been carried out in this regard in Western Rajasthan. **Objectives:** To find out the prevalence and age, sex, religion-wise distribution of hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV infections in HD patients in a tertiary care institute of Western Rajasthan. **Materials and Methods:** This cross-sectional study was conducted for 3 months in HD unit at Dr. S. N. Medical College, Jodhpur. All patients ($n = 1314$) were screened for hepatitis B surface antigen (HBsAg), antibody to HCV (anti-HCV) and HIV antibody. Prevalence and age, sex, religion-wise distribution of these infections were observed. **Results:** A total of 1314 patients (967 males and 347 females) were screened for the presence of HBV, HCV and HIV infections. It was found that 92 (7.0%) patients were positive only for HBsAg, 483 (36.75%) only for anti-HCV 12 (0.9%) for HIV antibody and 4 (0.3%) had dual HBV and HCV infection. **Conclusion:** There is a considerable burden of these infections in HD patient. Effort should be made to minimize infections to improve morbidity and mortality profile.


KEY WORDS: Hemodialysis; Hepatitis B; Hepatitis C; Human Immunodeficiency Virus

INTRODUCTION

Infections of Hepatitis B, Hepatitis C, and human immunodeficiency virus (HIV) viruses are common in India. These viruses have the property of transmission by parenteral route and through blood products. It is well-known fact that renal impairment can occur during

pathological course of these infections. In severe renal impairment, renal replacement therapy may be needed in the form of hemodialysis (HD). Infections of these viruses are increased in renal impairment patients especially on renal replacement therapy due to need of repeated transfusion of blood products and repeated exposure of parenteral route.^[1-8] Diminished immunological status due to renal impairment also predisposes these patients to infections. These infections can lead to increased morbidity and mortality in HD patients.

It is important to know the prevalence of these infections in HD patients to access magnitude of the problem and to make better framework to decrease disease burden by preventive measures. Not much work has been done in

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this regard in Western Rajasthan so this study was carried out to improve morbidity and mortality profile of HD patients.

MATERIALS AND METHODS

This cross-sectional study was conducted for 3 months (June to August 2016) in HD unit of a tertiary care institute of Western Rajasthan. The dialysis unit of the institute had a total of 13 HD machines. There were three separate machines for hepatitis B virus (HBV), HCV, HIV-infected patients (one for each) in separate chambers. In this study, 1314 HD patients were participated and subjected to detail history and clinical examination. A preformed performa was filled with all the necessary informations. Blood samples of all enrolled patients were drawn before HD and sent in institutional laboratory for evaluation of hepatitis B surface antigen (HbsAg) by two-step immunoassay ‘‘Hepalisa’’ (J. Mitra & Co. Pvt. Ltd., New Delhi, India), for anti-HCV antibodies by a fourth generation ELISA (J. Mitra & Co. Pvt. Ltd., New Delhi, India), for anti-HIV antibody by a fourth generation ELISA (Vironostika HIV uniform II, Biomerieux, Netherland).

Statistics

Relevant statistics were applied. Simple tabulation and proportions were calculated.

RESULTS

A total of 1314 patients (967 males and 347 females) participated with male:female nearly 2.8:1. Among them 1080 individuals were Hindu with male:female nearly 2.4:1 and 234 individuals were Muslims with male:female nearly 7.5:1. Age ranges from 17 to 84 years with mean age of 47.3 years. Most ($n = 689$, 52.3%) individuals were in 30-49 years of age group. In the study population 523 (40%) individuals were <40 years of age (Table 1).

It was found that 483 (36.75%) patients were positive only for anti-HCV, 92 (7.0%) patients only for HBsAg, 12 (0.9%) patients for HIV antibody and 4 (0.3%) had dual HBV and HCV infection (Figure 1).

Among 487 HCV-infected (483 only anti-HCV positive + 4 dual infected) patients 409 (84%) patients were of 30-59 years of age group. The mean age of HCV-infected patients was 43.1 years. 208 (42.7%) patients were <40 years of age (Table 2).

Among 96 HBV (92 only HbsAg positive + 4 dual infected) infected patients most patients ($n = 94$, 97.9%) were of 40-69 years of age group. The mean age of HBV-infected

patients was 54.2 years. Only 2 (2.1%) patients were <40 years of age (Table 3).

Among 12 HIV-infected patients most patients ($n = 11$, 91.6%) were of 30-49 years of age group. Mean age of HIV-infected patients was 39.4 years. Six (50%) patients were <40 years of age (Table 4).

DISCUSSION

Among 1314 HD patients male:female was 2.8:1. In Muslims, it is even higher 7.5:1. There is need of further evaluation of the facts related to less need of HD in females on genetic, pathological and social basis. As female health is well-known neglected aspect of developing countries, these results may be reflection of lesser use of health-care facilities by the females.

Among HD patients maximum prevalence was found of HCV infection (37.1%) followed by HBV infection (7.3%) and HIV infection (0.9%). Several studies were conducted in different parts of India aiming prevalence of infections in HD patients. Reddy *et al.*^[1] (2005, Hyderabad) found 5.9% HCV, 1.4% HBV, 3.7% dual infection. Chowdhury *et al.*^[2] (2005, West Bengal) reported 2.97% HBV infection. Jain

Table 1: Age, sex, religion-wise distribution of study population

Age groups (years)	Male		Female	
	Hindu	Muslim	Hindu	Muslim
10-19	0	1	18	0
20-29	126	19	42	1
30-39	186	21	92	17
40-49	175	87	60	1
50-59	131	48	72	7
60-69	109	28	27	0
70-79	14	0	4	0
>80	19	3	5	1
Total	760	207	320	27

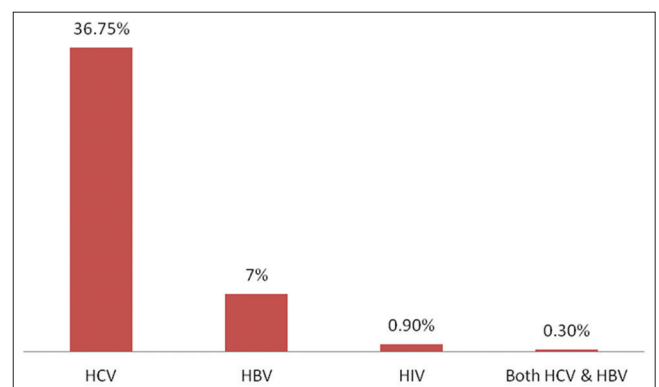


Figure 1: Distribution of hepatitis C virus, hepatitis B virus, human immunodeficiency virus infection in hemodialysis patients

Table 2: Age, sex, religion-wise distribution of HCV infected patients

Age groups (years)	Male		Female	
	Hindu	Muslim	Hindu	Muslim
10-19	0	1	0	0
20-29	43	11	19	1
30-39	93	6	33	1
40-49	71	27	27	1
50-59	51	48	34	7
60-69	52	2	8	0
70-70	0	1	0	0
>80	0	0	0	0
Total	310	47	121	9

HCV: Hepatitis C virus

Table 3: Age, sex, religion-wise distribution of HBV infected patients

Age groups (years)	Male		Female	
	Hindu	Muslim	Hindu	Muslim
10-19	0	0	0	0
20-29	1	0	0	0
30-39	1	0	0	0
40-49	2	14	12	0
50-59	33	0	1	0
60-69	16	0	16	0
70-70	0	0	0	0
>80	0	0	0	0
Total	53	14	29	0

HBV: Hepatitis B virus

Table 4: Age, sex, religion-wise distribution of HIV infected patients

Age groups (years)	Male		Female	
	Hindu	Muslim	Hindu	Muslim
10-19	0	0	0	0
20-29	0	0	1	0
30-39	3	1	1	1
40-49	4	1	0	0
50-59	0	0	0	0
60-69	0	0	0	0
70-70	0	0	0	0
>80	0	0	0	0
Total	7	2	2	1

HIV: Human immunodeficiency virus

and Nijhawan^[3] (2008, Jaipur) found 30% HCV, 11% HBV, 3% dual infection. Saravanan et al.^[4] (2009, Chennai) found 26.7% HCV, 44.6% HBV, 5.9% dual infection. Bhaumik and Debnath^[5] (2012, Tripura) found 12.1% HCV, 12.1% HBV, 1.2% dual infection. Mittal et al.^[6] (2013, Uttarakhand) found 16.1% HCV, 10.2% HBV and 1.7% HIV infection.

Recently, Malhotra et al.^[7] (2016, Punjab) found 33.5% HCV, 1.5% HBV, 0.8% dual HBV and HCV infection in HD patients.

Most studies support our results that HCV is most prevalent infection in HD patients followed by HBV and HIV. Variation in values may be due to difference in population structure of different geographical areas and method applied.

In the current study, most patients (97.9%) with HBV infection belongs to above 40 age group only few (2.1%) were <40 years of age whereas 42.7% HCV-infected patients were <40 years of age. It showed that pattern of infectivity of HBV is mainly toward older age group whereas HCV infection is prevalent in both younger and older group in HD patients. HIV infection was not found in older group (50 years and above) in our study that may be due to high mortality rate of this disease. No clear statement was given so far in previous studies about variation in predisposing age of HD patients for these infections. Further studies are needed to establish this pattern.

CONCLUSION

It is needed to focus more on female health in India. HCV is most prevalent infection in HD patients followed by HBV and HIV infection. There is difference in age distribution of HBV and HCV infection. HBV infection is mainly prevalent in older age group (>40 years) of HD patients, whereas HCV infection affects older as well as younger age group. Effort should be made toward preventive measures to reduce morbidity and mortality in HD patient.

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