

Prevalence of Hepatitis B & C in patients of End Stage Renal Disease (ESRD) on treatment of chronic/long-term hemodialysis

MUHAMMAD BILAL NASIR, JUNAID MUSHTAQ, MARIA ASLAM, GHIAS UN NABI TAYYAB, SHAFQAT RASOOL, IBTESSAM AMJAD, GHIAS UL HASSAN, ISRAR UL HAQ

Division of Gastroenterology & Hepatology Medical Unit 1, Post Graduate Medical Institute/LGH, Lahore.

Correspondence to Dr. Muhammad Bilal Nasir, Email: drbilalnasir@hotmail.com Cell: 03334407846

ABSTRACT

Background: Hepatitis B & C are worse conditions and are more likely to be common in patients of end stage renal disease taking hemodialysis. The incidence varies in different regions of the world.

Aim: To assess the prevalence of Hepatitis B and Hepatitis C viral infection among ESRD patients on chronic/long-term hemodialysis at a community hospital.

Methods: Cross sectional study was done on 171 ESRD registered cases from 2009-2014. Viral serology was done to confirm presence of Hepatitis B or C virus by rapid immuno-chromatographic test (ICT).

Results: There were 103/171 (60.2%) males and 68 (39.8%) females with mean age of 43.82±14.44 years. The factor caused ESRD were 58.5% hypertension, 33.2% diabetes and 25% had ischemic heart disease. There were 31.6% who had vaccination for HBV. In this study, 69% were found positive for HBV or HCV. For HBV 54.97% while for HCV 11.11% had positive serology while 0.03% were positive for both HBV & HCV. Of the 94 HCV positive patients, 25 were vaccinated for HBV.

Conclusion: The incidence of Hepatitis B & C viral infection is common in ESRD patients on chronic/long-term hemodialysis in poor resource countries, with low vaccination rate of HBV. The seroprevalence for HCV rises abruptly with duration of dialysis.

Keywords: Hepatitis C, Hepatitis B, Hemodialysis, Chronic kidney disease, seropositivity

INTRODUCTION

Hepatitis B virus (HBV) and hepatitis C virus (HCV) are the most common reasons causing liver diseases¹. Hepatitis B is estimated to result in 563,000 deaths and hepatitis C in 366,000 deaths annually.^{2,3} In Pakistan, 4 to 5% population is affected due to these viruses^{4,5}. But scarce data regarding prevalence & risk factors of HBV & HCV infection at national level⁶.

Stringent measures should be taken to control the infection, which is necessary to avert transmission of this nosocomial infection.⁷ But in Pakistan, the evidence is scarce and further studies are required to be conducted, particularly an audit to confirm the incidence in already registered patients, so that further spread of HBV or HCV can be prevented.

The objective of the study was to assess the frequency of Hepatitis B and Hepatitis C virus infection among ESRD patients on chronic/long-term hemodialysis (HD) at a community hospital and determine the correlation of HBV or HCV infection with the duration of hemodialysis.

METHOD

A retrospective, cross sectional study was conducted at the dialysis center of Lahore General Hospital, Lahore from 2014-2017. Medical records of 171 patients were reviewed. All patients had been on hemodialysis for at least 6 months. Data regarding demographics, cause of ESRD, duration of dialysis, co-morbid conditions, and vaccination status for HBV and HCV were documented. Viral serology was checked by rapid immuno-chromatographic test (ICT).

Received on 12-02-2019

Accepted on 18-07-2019

Data was analyzed using SPSS version 21. Chi-square test was used to compare the causes and comorbidities of HCV. Pearson correlation was used to determine the association between presence of HCV and HBV and duration of hemodialysis.

RESULTS

The mean age of patients was 43.82±14.43 years. There were 103/171 (60.23%) male and 68/171 (39.77%) female patients. The most common cause of ESRD was hypertension followed by Diabetes Mellitus; present in 100/171 (58.5%) and 22/171 (12.9%) patients, respectively. 33/171 (19.3%) patients had both diabetes and hypertension. Seven patients had obstructed uropathy (4.1%), and 2 (1.2%) female patients had post partum hemorrhage as cause of ESRD. In our study, 42/171 (24.56%) patients had coronary artery disease, 11/171 (6.4%) had congestive heart failure, 4/171 (2.3%) had Liver disease and 1/171 had cerebral vascular accident. 59/171 (34.5%) patients were on dialysis for about 6 months, 55/171 (32.2%) for 1 year, 20/171 (11.7%) for 2 years, 14/171 (8.2%) for 3 years, 20/171 (11.7%) for 4 years and 3/171 (1.8%) were on dialysis for 5 years. HCV and HBV serology was positive in 94/171 (55%) and 19/171 (11.1%) patients, respectively. According to the viral status, 80/171 (46.8%) patients were infected prior to the initiation of hemodialysis, duration of dialysis and prevalence of HBV and HCV were shown in table.1.

The correlation between the prevalence of HCV and duration of dialysis was 0.320 (p=0.000). This although significant, but is a very weak association. The correlation between HBV prevalence and duration of dialysis was 0.069 (p=0.371), which was not only weak but also insignificant (Table 3).

Table 1: Duration of dialysis and serology of patients

	Frequency	Percent
DOD		
Six months	59	34.5
One year	55	32.2
Two years	20	11.7
Three years	14	8.2
Four years	20	11.7
Five years	3	1.8
Total	171	100.0
HCV		
Negative	77	45.0
Positive	94	55.0
Total	171	100.0
HBV		
Negative	152	88.9
Positive	19	11.1
Total	171	100.0
Viral status		
Previously infected	80	46.8
New	27	15.8
Negative	64	37.4
Total	171	100.0
Vaccine status		
No	116	68.2
Yes	54	31.8
Total	170	100.0

Table 2: Relationship of HCV with duration of dialysis& viral status

	HCV		P value
	Positive	Negative	
n	94	77	171
DOD			
Six months	23	36	0.000
One year	27	28	
Two years	12	8	
Three years	14	0	
Four years	17	3	
Five years	1	2	
Viral status			
Previously infected	69	11	0.000
New	24	3	
Negative	1	63	
Vaccine status			
No	68	-	NA
Yes	25	-	

Table 3: Relationship of HBV with duration of dialysis& viral status

	HBV		P value
	Positive	Negative	
n	19	152	171
DOD			
Six months	6	53	0.424
One year	6	49	
Two years	2	18	
Three years	0	14	
Four years	4	16	
Five years	1	2	
Viral status			
Previously infected	12	68	0.000
New	7	20	
Negative	0	64	
Vaccine status			
No	18	-	NA
Yes	0	-	

Table 4: correlation between HCV or HBV with duration of dialysis

		Duration of dialysis
HCV	Pearson Correlation	.320**
	p-value	.000
HBV	Pearson Correlation	0.069
	p-value	0.371

DISCUSSION

Hepatitis B and C virus infections are global health problem⁸. Hepatitis Hepatitis-C infection is endemic among patients on long-term hemodialysis and the prevalence is much higher in developing countries when compared to the developed world⁹ Data suggests moderate-to-high incidence of HBV & HCV in among different regions of Pakistan. Most common cause of transmission of the disease is the use of contaminated needles, IV drug abuse and unsafe transfusion of blood and blood products¹⁰.

About 2 billion people all over the world have some record of previous or current HBV infection, and it is predictable that 248 million candidates are chronic carriers. Prevalence of HBsAg is reported in around 3.6% cases; though, it fluctuates depending on the geographic region. Approximately 600,000 die every year from HBV-related liver disease¹¹.

Previously, many researchers also reported the frequency of HBV & HCV in non-hemodialysis patients which ranged 3-56%.¹²⁻¹⁴ However, a high prevalence of HBsAg (14.6% weighted average, range 12.4–16.6%) and HCVAb (38% weighted average, range 23.7–68%) has been described in patients on chronic/long-term hemodialysis^{15,16,17,18}.

Similarly, in a study conducted in Libya, 34.9% cases had positive HBV or HCV (HCV 31.1%; HBV 2.6%; both 1.2%).¹⁹ In another study in India, HBV was present in 7.3% of the cases of hemodialysis and HCV in 12.1% cases (before and during hemodialysis)²⁰.

Hemodialysis patients typically acquire HCV during hemodialysis, direct contact between patients, a breach in infection control, contaminated equipment, or transfusion of contaminated blood products^{21,22}. Duong et al., seroprevalence of dialysis patients enrolled was 7% (95% CI; 2.3%-11.8%) HBsAg, 6% (95% CI; 1.7%-10.6%) HCV-coreAg and 1% (95% CI; 0.8%-2.6%) co-infection²³ In our study, we have observed that the correlation between HCV prevalence and duration of dialysis was 0.320 (p=0.000) which was although significant but very weak. But the correlation between HBV prevalence and duration of dialysis was 0.069 (p=0.371) which was not only very weak but also insignificant. This showed that there is no relationship between duration of dialysis and HBV or HCV prevalence.

CONCLUSION

Blood related infections like HBV & HCV are common finding of this study among chronic hemodialysis patients. This may be due to poor vaccination rate for HBV. The chances of attaining HCV infection increases abruptly with prolonged duration of hemodialysis signifying cross infection in dialysis units.

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