

FREQUENCY OF HEPATITIS B VIRUS INFECTION IN HEMODIALYSIS PATIENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Objectives: To determine the frequency of hepatitis B in hemodialysis patients in Lady Reading Hospital Peshawar Khyber-Pakhtunkhwa

Material & Methods: The study design was cross sectional and carried out in the department of Nephrology Lady Reading Hospital Peshawar Khyber Pakhtunkhwa from February 2018 to July 2018. All eligible patients who were on hemodialysis were enrolled in the study through consecutive non probability sampling.

Results: In our study 177 participants were included, 73.4% males and 26.6% females. The participants mean age was 41.8 ± 8.6 years. Mean number of hemodialysis sessions were 15.2 with standard deviation of 5. Hepatitis B virus was present in 27.1%.

Conclusion: Hepatitis is highly prevalent in our population which is subjected to repeated hemodialysis. More robust screening techniques should be used to detect these at an early stage.

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INTRODUCTION

Chronic Kidney disease (CKD) may be defined as "A condition frequently associated with uncontrolled hypertension and diabetes" it has become a major economic and public health problem both locally and globally.¹ The term Chronic Renal Failure (CRF) means the last stage of chronic kidney disease (CKD) in which there is decline of glomerular filtration rate (GFR) below 0.25 ml/s.² Chronic Renal Failure (CRF) is a globally serious economic and public health issue with an increasing prevalence and incidence.³ The most important risk factor for renal and cardiovascular diseases is hypertension, till now approximately 1 billion adults worldwide are suffering from hypertension.⁴ Glomerular hyper-filtration and systemic hypertension are the major factors leading to progressive nephron damage. If blood pressure is controlled effectively then progression of renal disease in adults will be de-

layed.⁵ Over 2 billion people are affected with Hepatitis B globally and 350 million people are affected from chronic hepatitis B virus infection.⁶ Its infectivity is more than the other blood-borne pathogens and a single needle prick injury indicates a risk of 300 hepatitis B virus infection (the risk is 30%), 30 hepatitis C virus infection (the risk is 3%) and³ Human Immunodeficiency virus (HIV) infection (risk is 0.3% per 1000 respectively.⁷ The patients on Hemodialysis (HD) are more at risk of getting hepatitis B virus (HBV) infection, the main reason of which is frequent contact with blood supplies and surfaces containing these viruses.⁸

As a result of this the prevalence of Hepatitis B virus (HBV) infection in hemodialysis patients is very high, although it is different among countries and among different hemodialysis units of the same country.⁹ The established risk factors for HBV infection are duration of hemodialysis and number of blood transfusions. The prevalence of HBV infection have decreased by the use of blood product screening in blood banks and erythropoietin treatment, in spite of this outbreak of HBV still occurs.¹⁰ The reported prevalence of HBV among dialysis patients is 11.2% and 8% in Asia.¹¹

Our study is designed to determine the frequency of HBV in patients on chronic hemodialysis (HD). As mentioned above, the patients on HD are at increased risk of

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viral infection due to their continuous exchange of body fluids and other blood related products. Moreover, it is also mentioned in literature that the burden of HBV varies from one hemodialysis settings to another due to variation in resources and expertise. This study will give us local evidence of magnitude of HBV in patients on chronic HD. Our study results will be distributed to local health authorities to make them aware about the severity of the problem and future research recommendations to prevent the enhancing burden of HBV among HD dependent patients.

MATERIAL & METHODS

This descriptive cross sectional study was carried out in the department of Nephrology, Lady Reading Hospital, Peshawar Khyber Pakhtunkhwa from February 2018 to July 2018. Sample size was 177 and technique used was consecutive (non-probability) sampling. All patients with either gender having age 18-65 years on chronic HD with minimum of five HDs done in the past 3 months were included in the study. Patients who were already diagnosed with HBV on medical records with history of any type of treatment received for Hepatitis B in the past were excluded from the study.

The study was done after approval from hospital research and ethical committee. All patients fulfilling the inclusion criteria (i.e. patients presenting to the dialysis unit for their routine dialysis and with history of at least 5 sessions of dialysis in the past 3 months) was included in the study. The benefits and purpose of the study and associated risks were explained to the patients. An informed consent was taken from all the patients and detailed history and clinical examination was done. 10cc of blood was obtained from all patients and was sent to hospital laboratory immediately to detect HBV. All the laboratory procedures were conducted from single hospital laboratory under supervision of single expert pathologist having minimum of 5 years experience. A pre designed proforma was used that comprised of demographic data and frequency of HBV.

The data was analyzed on SPSS version 23. Percentage and frequency were calculated for categorical variables like gender and HBV. Mean and standard deviation was calculated for continuous variables like age and Number of hemodialysis in the past. Frequency of HBV was stratified among the age, gender and number of dialysis sessions to the effect modifiers using chi square test with p value of ≤ 0.05 taken as significant.

RESULTS

The mean age of our sample was 41.7 years with a standard deviation of 8.6 years with a minimum age of 25.5 and maximum age of 55 years in our study. We divided the patients in 3 different age groups i.e. > 25 to 35 years, > 35 to 45 years and > 45 to 55 years. (Table

1). Out of 177 participants, there were 73.4% males and 26.6% females (Table 2). Mean no of HD sessions were 15.2 with SD of 5. Table 3 elaborates the categories wise distribution of HD sessions. All patients were subjected to screening of HBV and found that it was present in 27.1%. (Table 4) Stratification of HBV was done on the basis of age, gender and categories of HD sessions as elaborated in table 5-7 after applying chi square test.

Table 1: Age-Wise Distribution of Participants (n=177).

Age in years	Frequency & % ages
25 to 35	49 (27.7)
> 35 to 45	48 (27.1)
> 45 to 55	80 (45.2)
Total	177 (100.0)

Table 2: Gender Wise Distribution of Sample (n=177)

Gender	Frequency % ages
Male	130 (73.4)
Female	47 (26.6)
Total	177 (100.0)

Table 3: No of Hemodialysis Sessions (n= 177)

HD Sessions	Frequency % ages
5 to 11 sessions	61 (34.5)
> 11 to 17 sessions	58 (32.8)
> 17 to 23 sessions	58 (32.8)
Total	177 (100.0)

Table 4: Frequency of HBV (n = 177)

HBV	Frequency % ages
Yes	48 (27.1)
No	129 (72.9)
Total	177 (100.0)

Table 5: Age Groups Wise Stratification of HBV

		HBV	
		Yes	No
Age Groups	25 -35 years	13 26%	36 74%
	> 35-45 years	24 50%	24 50%
	> 45-55 years	11 14%	69 86%
Total		48 27%	129 73%

Table 6: Gender Stratification of Patient with HBV (n = 177)

Gender of the patient	HBV		P value
	Yes	No	
Male	48	82	<0.001
	36.9%	63.1%	
Female	0	47	
	0.0%	100%	
Total	48	129	
	27.1%	72.9%	

Table 7: Hemodialysis Sessions Wise Stratification of HBV (n = 177)

No of Dialysis session in Categories	HBV		P value
	Yes	No	
5 to 11 sessions	13	48	0.032
	21.3%	78.7%	
> 11 to 17 sessions	23	35	
	39.7%	60.3%	
> 17 to 23 sessions	12	46	
	20.7%	79.3%	
Total	48	129	
	27.1%	72.9%	

DISCUSSION

WHO has categorized Pakistan as intermediate HBV prevalence region.¹² Over the past 15 to 20 years the prevalence of HBsAg has been decreased in Pakistan, as shown by earlier reports to 8¹³ and 10 to 15 percent¹⁴ in the healthy adult population. The decrease in HBV positivity may be due to testing by more specific HBs Ag Elisa kits with few false-positive results and is due to use of vaccination and increased awareness against hepatitis B. Recently, Pakistan has included hepatitis B vaccine in routine immunization schedule of neonates. The immunization coverage of which was 65 percent in 2004.¹⁵ In Armed Forces personnel large-scale hepatitis B vaccination was done in the past 10 years and among health care professionals, with vaccination status of 86 to 98 percent.¹⁶ The other risk factors which seems to be unchanged, are repeated use of potentially contaminated razors by barbers, reuse of disposable glass, syringes, improper dental practices¹⁷ and other risk factors seem to be unchanged.

The established risk factors for HBV infection are duration of hemodialysis and the number of blood transfusions.¹⁸ The prevalence of Hepatitis B infection has been decreased by the use of erythropoietin treatment and screening in blood banks. However, outbreak of HBV still occurs.¹⁹ Hospital acquired infection may play a role in such outbreaks which is supported by the association between risk of infection with this virus and hemodialysis duration.²⁰

In Our study, the prevalence rates of HBV infection among hemodialysis patients was more or less higher as compared to developing countries and it was higher than developed countries.²¹⁻²³ The reason for high prevalence may be attributed to the prevalence of Hepatitis B infection in general population. In Pakistan the rate of Hepatitis B virus infection ranges from moderate to high endemicity. As a result prevalence of HBV among hemodialysis patients has increased in recent years. Developing countries need implementation of infection control programs. Our study showed a higher prevalence of HBV infection. The results might be influenced by differences in the specificities and sensitivities of the procedures used, they revealed that the current infection-control techniques has not decreased the prevalence of HBV infection. In these situations, hospital transmission of infection might play an important role.

CONCLUSION

HBV is highly prevalent in our population which is subjected to repeated hemodialysis.

RECOMMENDATION

More robust screening techniques should be used to detect these at an early stage. Moreover, more research is recommended for a possible source of infection to the HD patients so that future preventive mechanisms may be described.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khattak N: Main Idea Principal Author.

Afridi A: Data analysis.

Din IU: Data Collection.

Shafiullah: Content Writing.

Nisar S: Data Collection.

kibria Z: Abstract and content wiring.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.