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Research Article

INCIDENCE OF HIV, HEPATITIS B AND HEPATITIS C INFECTION AMONG PATIENTS UNDERGOING DIALYSIS

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Abstract- Background: Dialysis modality is a major risk factor for HIV, HBV and hepatitis C virus infections. High accuracy quality control has a positive effect in preventing infection. The haemodialysis environment has been recognized as a reservoir for viral infection, and transmission of the virus to patients as well as to staff members. Aim: The aim of this study was to evaluate the effect of dialysis modality on the prevalence of HIV, HBV and HCV infections in patients subjected to dialysis. Material and methods: The study included all dialysis patients who attended the dialysis center at Shri Krishna Hospital, Karamsad, during the period from January 2018 to December 2018. The total patients during this period were 250. HIV, HCV and HBsAg were determined on ADVIA Centaur® XP Immunoassay Analyser by Chemiluminescence Methods. Serum samples were collected according to the routine protocol used in the biochemistry department. Data subjected to computer analysis computer-analyzed using (SPSS 20.USA) program. Reference management was done by Endnote X7 program. Results: This study considered the total number of patients undergoing haemodialysis and the percentage of HIV, Hepatitis B and C infections. In addition, HCV infection among dialysis patients is associated with an increased risk of death. Our study was conducted on a total of 250 patients who underwent dialysis in 2018. In the first screening of dialysis patients, we found 5 patients (2%) out of 250 patients had HCV positive, 245 (98%) of patients were HCV negative. But six months later, the infection percentage was up to 9 patients (3.6%) positive out of 250 patients and 241 (96.4%) had negative HCV. Also, in the first examination of dialysis patients, we found that all patients had negative HBsAg. But after six months, we found 1 (0.4%) out of the 250 patients had positive HBsAg and 249 (99.6%) of the patients had HBsAg negative. Conclusion: The main conclusions of the current study are that the prevalence of hepatitis B virus infection increased with long-term dialysis, and that hepatitis C virus infection was the most prevalent among patients with longer dialysis.

Keywords- *Dialysis, HIV, Hepatitis B virus, Hepatitis C virus*

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Introduction

HBV and hepatitis C virus are endemic in many regions of the world and common causes of chronic hepatitis, cirrhosis and liver cancer [1]. Hepatitis B and hepatitis C are the leading causes of morbidity and mortality among the Indian population and their significant impact in patients with kidney disease and haemodialysis [2]. Both HBV and HCV can be transmitted by infected blood products. Thus, patients undergoing dialysis maintenance will have a risk of infection. Several studies have investigated how HCV infection influences survival among dialysis patients [3-5]. Dialysis modality is an important risk factor for HIV, HBV and hepatitis C virus infection. Controlling quality control with high accuracy has a positive effect in preventing infection. The haemodialysis environment has been identified as a reservoir for viral infection and transmission of this virus to patients as well as to staff members. One meta-analysis shows a correlation between positive HCV Ab and increased mortality risk among patients receiving regular dialysis [6]. A study conducted in the United States by Josselson, *et al*., (1987). reported similar mortality rates among long term haemodialysis patients with positive HBsAg and HBsAg negative [7], while a retrospective study in India by Jha, *et al*., (1993). reported a higher mortality rate among hepatitis B patients undergoing dialysis [8]. In another study, it was observed a significant increase in the prevalence of HBV and HCV among patients with the longest dialysis. While HBV infection was not associated with significant change in mortality, hepatitis C infection increased the risk of mortality among patients receiving dialysis [9]. Anwar, *et al*., (2016) reported that there was a significant correlation between the infection of the hepatitis C virus and total numbers of haemodialysis patient. Increase in the frequency of HCV infection was observed with an increase in the number of dialysis [10]. A study of Abdel-Moneim, *et al*., (2012) reported that about 28% frequency of HCV caused by dialysis in the Pakistani population [11]. This study aims to evaluate the effect of dialysis modality on the prevalence of HIV, HBV and HCV infection in Patients receiving dialysis.

Material and methods

The study included all dialysis patients who attended the dialysis center at Shri Krishna Hospital, Karamsad, during the period from January 2018 to December 2018. Serum samples were collected according to the routing protocol used in the clinical lab. The total patients in this period were 250 patients. HIV, HCV and HBsAg were determined on ADVIA Centaur® XP Immunoassay Analyser by Chemiluminescence Methods, Siemens Dimension® Germany) (2). Data were computer-analyzed using (SPSS 20.USA) program. Reference management was done by Endnote X7 program.

Results

This study considered the total number of patients undergoing haemodialysis and the percentage of HIV, Hepatitis B and Hepatitis C infections. In addition, HCV infection among dialysis patients is associated with an increased risk of death. Our study was conducted on a total of 250 patients who underwent dialysis in 2018.

Table-1 *HCV infection in patients undergoing hemodialysis over 12 months*

		HCV	HCV after 2 months	HCV after 4 months	HCV after 6 months
Negative	No of patients	245	245	243	241
	% of Total	98%	98%	97.20%	96.40%
Positive	No of patients	5	5	7	9
	% of Total	2%	2%	2.80%	3.60%
Total	No of patients	250	250	250	250
	% of Total	100%	100%	100%	100%

Table-2 *HBsAg infection in patients undergoing hemodialysis over 12 months*

		HBsAg	HBsAg After 2 Months /	HBsAg After 4 Months	HBsAg After 6 Months
Negative	No of patients	250	250	250	249
	% of Total	100%	100%	100%	99.60%
Positive	No of patients	0	0	0	1
	% of Total	0.00%	0.00%	0.00%	0.40%
Total	No of patients	250	250	250	250
	% of Total	100%	100%	100%	100%

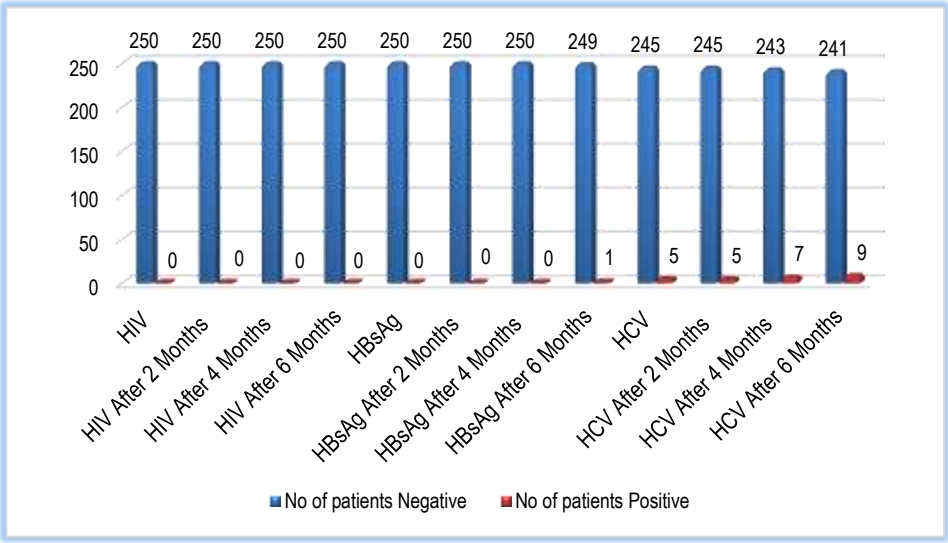

Fig-1 Distribution of patients according to HIV, HBsAg and HCV results (No of patients)

Table-3 *Distribution of patients according to admitted month to the dialysis center*

		Months												Total
		January	February	March	April	May	June	July	August	September	October	November	December	
State	Discharge	7	10	15	7	12	14	8	10	8	4	3	4	102
	Dama*	13	4	4	6	10	3	8	1	7	8	8	5	77
	Died	2	1	1	4	0	0	5	0	5	4	3	1	26
	Continuous	1	4	3	0	5	2	3	3	1	2	4	17	45
Total		23	19	23	17	27	19	24	14	21	18	18	27	250

** (DAMA) = Discharge Against Medical Advice*

Table-4 *Distribution of patients according to health status of the patient at the exit*

Gender * HCV After 6 Months * Count					
State			HCV After 6 Months		Total
			Negative	Positive	
Discharge	Gender	Male	57	2	59
		Female	43	0	43
	Total		100	2	102
Dama	Gender	Male	52	1	53
		Female	23	1	24
	Total		75	2	77
Died	Gender	Male	17	1	18
		Female	8	0	8
	Total		25	1	26
Continuing	Gender	Male	25	2	27
		Female	16	2	18
	Total		41	4	45
Total	Gender	Male	151	6	157
		Female	90	3	93
	Total		241	9	250

In the first screening of dialysis patients, we found 5 (2.0%) patients out of a total of 250 patients who had HCV positive, 245 (98%) of patients had HCV negative. After four months, the Hepatitis C virus infection percentage was up to 7 patients (2.8%) positive from a total of 250 patients and 243 (97.2%) had negative HCV. After six months, the infection percentage was up to 9 patients (3.6%) positive from a total of 250 patients and 241 (96.4%) had negative HCV. Also, in the first examination of dialysis patients, we found that all patients had negative HBsAg. After six months, we found 1 (0.4%) out of the 250 patients had positive HBsAg and 249 (99.6%) of the patients had HBsAg negative. In the first examination of dialysis patients, we found that all patients had negative HIV. Also, after six months, all patients were negative with HIV.

Discussion

Patients suffering from end Stages of renal diseases such as chronic kidney disease, chronic renal failure and acute renal failure, have a complete failure in renal function or insufficient kidney functions to remove the wastes from the blood. Thus, they need continuous cleaning of blood and removing harmful nitrogenous wastes by artificial mechanisms. This mechanism is called dialysis.

Dialysis is a treatment that handles kidney function, if the kidney stops functioning. Two types of dialysis are available, peritoneal dialysis and haemodialysis. Haemodialysis, in your blood is placed through a filter outside your body, cleaned, and then returned to back. Peritoneal dialysis is defined as the cleaning of blood within the body. A special fluid is placed into the abdomen to absorb wastes from the blood. The fluid is then drained away [12]. The haemodialysis environment has been recognized as a reservoir of viral infection, which transmits viruses to patients. The major infection that infects dialysis patients includes HBV, HCV, and HIV virus[13]. Because of multiple dialysis, these patients are more likely to be infected with hepatitis C virus and hepatitis B virus [14]. Quality control with high accuracy has a positive effect in preventing infection. The total number of patients who underwent dialysis during 2018 was 250 patients in the Shree Krishna Hospital, Karamsad, all included in our study. The data was collected, we found the high male to female ratio (1.7:1) as 157 are male and 93are female. One hundred and two patients were discharged (59 male and 43 female), two of male patients had positive hepatitis C virus. Seventy-seven patients were DAMA (53 males and 24 females), two of them had hepatitis C virus (one male and one female). Twenty-six patients (18 males and 8 females) died and one of the male patients was infected with the hepatitis C virus. Forty-five patients (27 males and 18 females) remained under dialysis until 2019, four of them were infected with Hepatitis C virus (two males and two females). In the first screening of dialysis patients we found 5 (2.0%) patients out of a total of 250 patients who had HCV positive. However, six months later, the rate of infection increased to 9 patients (3.6%) infected with the hepatitis C virus. Also, in the first screening of dialysis patients we found that all patients had HBsAg negative. But six months later, we found 1 (0.4%) of the 250 patients with positive HBsAg and 249 (99.6%) of patients had negative HBsAg. A study supports our results showed a high ratio of males to females, also HCV seropositive percentage in males was higher (6.9-9.0%) than females (5.3-8.5%) [15]. In a previous study, performed by Kwon, *et al*., (2015) [9]. Patients with dialysis of >10 years showed significantly higher prevalences of HBV and HCV infection compared to patients with a dialysis <1 year [9]. That agreement with my study, we found higher prevalence's of HBV and HCV infections after six months. A literature review from various articles showed the relation in HCV/ HBV infection and the frequency of dialysis [16]. As well as in our study the same results. Another study supports our study, reported that There is a significant correlation between HCV infection and frequency of haemodialysis patients. There has been an increase in the frequency of HCV infection with an increase in the number of dialysis [10]. Kwon, *et al*., (2015) concluded that the prevalence of HBV and HCV infection increased with longer dialysis, and that both HBV and HCV infections were the most prevalent among patients with the longest dialysis period [9]. This result is similar to our study. The haemodialysis environment has been recognized as a reservoir for viral infection. The rate of hepatitis virus transmission varies from hospital to hospital. Quality control with high accuracy has a positive effect in preventing infection.

Conclusion

The main conclusions of the current study are that the prevalence of hepatitis B virus infection increases with long-term dialysis, and that hepatitis C virus infection was the most prevalent among patients with longer dialysis.

Research Category: Haemodialysis

Abbreviations:

HIV: Human Immunodeficiency Virus
HCV: Hepatitis C Virus
HBV: Hepatitis B Virus
HBsAg: Hepatitis B Surface Antigen
DAMA: Discharge Against Medical Advice
SPSS: Statistical Package for the Social Sciences

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Conflict of Interest: None declared

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