

Frequency of Number of Dialysis Done in Patients with CKD and then Compare the Frequency of HCV Infection in Patients with CKD on Hemodialysis

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ABSTRACT

Objective: To assess the frequency of number of dialysis done in patients with CKD and then compare the frequency of HCV infection in patients with CKD on hemodialysis

Study Design: Cross sectional study

Setting: Medical Unit I, Department of Gastroenterology, Lahore General Hospital, Lahore.

Duration: The study was conducted for a period of six months from 15th December, 2017 to 18th June, 2018.

Methodology: A total of 120 patients were included in the study. Then number of dialysis done was also noted. Blood sample was sent to the pathology laboratory and HCV was labeled. All the data was recorded on proforma. Data was analyzed with IBM-SPSS version 21.

Results: In this study, the mean age of patients was 47.47±18.65years. There were 56 (46.7%) male while 64 (53.3%) female patients. The mean BMI of patients was 22.62±4.04kg/m². In this study, 57 (47.5%) had <50 dialysis sessions, 40 (33.3%) had 50-100 sessions, 14 (11.67%) had 101-200 sessions and 9 (7.5%) had >200 sessions. In patients with <50 dialysis, 10 (17.5%) had HCV, patients with 50-100 dialysis, 9 (22.5%) had HCV, patients with 100-200 dialysis, 7 (50%) had HCV and patients with >200 dialysis, 5 (55.6%) had HCV. The difference was significant (p<0.05).

Conclusion: The frequency of HCV was significantly higher in patients with >100 sessions of dialysis as compared to <100 dialysis sessions.

Keywords: Hemodialysis, Chronic Kidney Disease, Hepatitis C Virus, Sessions

INTRODUCTION

Hemodialysis is an artificial way of maintaining hemostasis in the body in the patients with severe renal impairment; it is indicated for the patient with acute renal failure and stage IV chronic kidney disease (CKD), most of the patients who are undergoing dialysis do that for long period of times and are exposed to the numerous side effects.¹ Despite reduction of hepatitis C prevalence after recognition of the virus and testing of blood products, hemodialysis patients still comprise a high risk group. The natural history of hepatitis C virus (HCV) infection in dialysis is not fully understood while the clinical outcome differs from that of the general population.²

Early diagnosis and treatment HCV infection prior to KT prevents complications post-transplantation and reduces mortality. In addition to screening for anti-HCV antibodies and detecting HCV RNA, percutaneous liver biopsy is particularly valuable for assessing the stage of liver damage in HCV-infected patients, because the stage of fibrosis is important determining optimal treatment for HCV.³ The transmission of HCV is probably not associated with the dialysis procedure itself, but rather with a lack of knowledge regarding the application of preventative methods, including universal precautions.⁴ HCV infection is still common among dialysis patients, but the natural history of HCV in this group is not completely understood. Recent evidence has been accumulated showing that anti-HCV positive serologic status is significantly associated with lower survival in dialysis population; an increased risk of liver and cardiovascular disease-related mortality compared with anti-HCV negative subjects has been found.⁵

Hepatitis C is caused by blood borne pathogen the HCV. In the study, there were 28 (46.7%) patients who had <50 dialysis, 22 (36.7%) had 50-100 dialysis, 6 (10%) had 100-200 dialysis while 4 (6.7%) cases had >200 dialysis. About 28% frequency of HCV caused by dialysis was reported in Pakistani population. In patients with <50 dialysis, 21.42% had HCV, patients with 50-100 dialysis,

22.72% had HCV, patients with 100-200 dialysis, 16.66% had HCV and patients with >200 dialysis, 50% had HCV.⁶

Rationale of this study is to assess the frequency of number of dialysis done in CKD patients and compare the frequency of HCV infection in patients with CKD on maintenance hemodialysis. It is known that HCV is common encountered problem in CKD patients on hemodialysis. Literature showed that with the increasing number of dialysis, the risk of HCV increases. But there is only one study of this type was conducted as mentioned above. Not much work has been done that relates number of dialysis with occurrence of HCV in CKD patients. So we want to conduct this study to confirm the extent of problem in local population and get current evidence. So that we may be able to implement the results of this study in future, this could help us in planning better management protocols and regular screening of dialysis patients for HCV on regular basis.

MATERIALS AND METHODS

This cross sectional study was conducted at Medical Unit I, Department of Gastroenterology, Lahore General Hospital, Lahore. The duration was six months from 15th December, 2017 to 18th June, 2018. Total 120 patients of both gender presented with CKD on hemodialysis were enrolled. Patients' ages were ranging between 18 to 80 years. HBV, HIV or already taken treatment for HCV, patients with HCV before CKD, and patients who took dialysis previously from other hospital were excluded.

Informed consent was taken. Basic demographics like name, age, gender, BMI, duration of CKD were noted. Then number of dialysis done was also noted (as per operational definition). Blood sample was obtained by using 5cc BD syringe. Sample was sent to the pathology laboratory of the hospital for polymerase chain reaction. Reports were assessed and HCV was labeled (as per operational definition). All the data was recorded on especially designed proforma (attached).

Data was analyzed with IBM-SPSS version 21. Mean ± standard deviation was presented for quantitative variables like

age, BMI, duration of CKD and dialysis. Frequency and percentage were computed for qualitative variables like gender, number of dialysis and HCV. Frequency of HCV was compared in different dialysis by using chi-square test. P-value <0.05 was taken as significant. Effect modifiers like age, gender, BMI, duration of CKD and dialysis was controlled by stratification. Post-stratification, chi-square test was applied with $p \leq 0.05$ taken as significant.

RESULTS

In this study, the mean age of patients was 47.47 ± 18.65 years. Table 1

There were 56 (46.7%) male while 64 (53.3%) female patients. Fig 1

The mean BMI of patients was $22.62 \pm 4.04 \text{ kg/m}^2$. Table 2

In this study, 57 (47.5%) had <50 dialysis sessions, 40 (33.3%) had 50-100 sessions, 14 (11.67%) had 101-200 sessions and 9 (7.5%) had >200 sessions. Fig 2

In patients with <50 dialysis, 10 (17.5%) had HCV, patients with 50-100 dialysis, 9 (22.5%) had HCV, patients with 100-200 dialysis, 7 (50%) had HCV and patients with >200 dialysis, 5 (55.6%) had HCV. The difference was significant ($p < 0.05$). Table 3

Data was stratified for age of patients. In patients aged 18-30 years, in cases with <50 dialysis, 3 (27.3%) had HCV, cases with 50-100 dialysis, 1 (10%) had HCV, cases with 100-200 dialysis, 5 (83.3%) had HCV and cases with >200 dialysis, 2 (100%) had HCV. The difference was significant ($p < 0.05$). In patients aged 31-60 years, in cases with <50 dialysis, 6 (21.4%) had HCV, cases with 50-100 dialysis, 4 (25%) had HCV, cases with 100-200 dialysis, 1 (14.3%) had HCV and cases with >200 dialysis, 1 (25%) had HCV. The difference was insignificant ($p > 0.05$). In patients aged 61-80 years, in cases with <50 dialysis, 1 (5.6%) had HCV, cases with 50-100 dialysis, 4 (28.6%) had HCV, cases with 100-200 dialysis, 1 (100%) had HCV and cases with >200 dialysis, 2 (66.7%) had HCV. The difference was significant ($p < 0.05$). Table 4

Data was stratified for gender of patients. In male patients, in cases with <50 dialysis, 4 (17.4%) had HCV, cases with 50-100 dialysis, 4 (21.1%) had HCV, cases with 100-200 dialysis, 6 (66.7%) had HCV and cases with >200 dialysis, 3 (60%) had HCV. The difference was significant ($p < 0.05$). In female patients, in cases with <50 dialysis, 6 (17.6%) had HCV, cases with 50-100 dialysis, 5 (23.8%) had HCV, cases with 100-200 dialysis, 1 (20%) had HCV and cases with >200 dialysis, 2 (50%) had HCV. The difference was insignificant ($p > 0.05$). Table 5

Data was stratified for BMI of patients. In underweight patients, in cases with <50 dialysis, 2 (18.2%) had HCV, cases with 50-100 dialysis and 101-200 dialysis, no patients had HCV and cases with >200 dialysis, 3 (60%) had HCV. The difference was insignificant ($p > 0.05$). In normal weight patients, in cases with <50 dialysis, 8 (30.8%) had HCV, cases with 50-100 dialysis, 9

(34.6%) had HCV, cases with 100-200 dialysis, 0 (0%) had HCV and cases with >200 dialysis, 2 (50%) had HCV. The difference was insignificant ($p > 0.05$). In overweight patients, in cases with <50 dialysis, 50-100 dialysis and >200 dialysis, no patient had HCV, in cases with 100-200 dialysis, 7 (63.6%) had HCV. The difference was significant ($p < 0.05$). Table 6

Table 1: Descriptive Statistics of age of patients

	n	120
Age (years)	Mean	47.47
	Standard Deviation	18.65
	Minimum	18
	Maximum	80

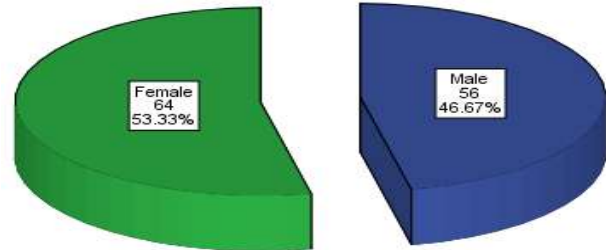


Fig 1: Distribution of gender of patients

Table 2: Descriptive Statistics of BMI of patients

	n	120
BMI (kg/m ²)	Mean	22.62
	Standard Deviation	4.04
	Minimum	16.50
	Maximum	29.77

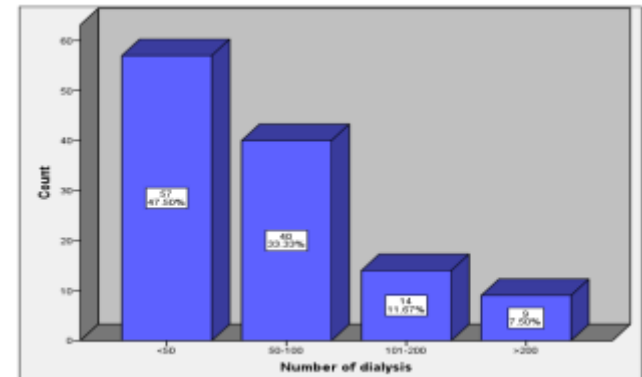


Fig 2: Distribution of number of dialysis

Table 3: Comparison of HCV in different number of dialysis

		Number of dialysis				Total
		<50	50-100	101-200	>200	
HCV	Yes	10 17.5%	9 22.5%	7 50.0%	5 55.6%	31 25.8%
	No	47 82.5%	31 77.5%	7 50.0%	4 44.4%	89 74.2%
Total		57 100%	40 100%	14 100%	9 100%	120 100%

Chi-Square Test = 10.693, p-value = 0.014 (Significant)

Table 4: Comparison of HCV in different number of dialysis stratified for age

Age	HCV	Number of dialysis				Total	p-value
		<50	50-100	101-200	>200		
18-30	Yes	3 27.3%	1 10.0%	5 83.3%	2 100%	11 37.9%	0.006
		8 72.7%	9 90.0%	1 16.7%	0 0.0%	18 62.1%	
	Total	11 100%	10 100%	6 100%	2 100%	29 100%	

31-60	Yes	6	4	1	1	12	0.950
		21.4%	25.0%	14.3%	25.0%	21.8%	
	22	12	6	3	43		
	78.6%	75.0%	85.7%	75.0%	78.2%		
61-80	No	28	16	7	4	55	0.017
		100%	100%	100%	100%	100%	
	1	4	1	2	8		
	5.6%	28.6%	100%	66.7%	22.2%		
61-80	No	17	10	0	1	28	0.017
		94.4%	71.4%	0.0%	33.3%	77.8%	
	18	14	1	3	36		
	100%	100%	100%	100%	100%		

Table 5: Comparison of HCV in different number of dialysis stratified for gender

Sex	HCV	Number of dialysis				Total	p-value
		<50	50-100	101-200	>200		
Male	Yes	4	4	6	3	17	0.016
		17.4%	21.1%	66.7%	60.0%	30.4%	
	19	15	3	2	39		
	82.6%	78.9%	33.3%	40.0%	69.6%		
Female	No	23	19	9	5	56	0.520
		100%	100%	100%	100%	100%	
	6	5	1	2	14		
	17.6%	23.8%	20.0%	50.0%	21.9%		
Female	No	28	16	4	2	50	0.520
		82.4%	76.2%	80.0%	50.0%	78.1%	
	34	21	5	4	64		
	100%	100%	100%	100%	100%		

Table 6: Comparison of HCV in different number of dialysis stratified for BMI

BMI	HCV	Number of dialysis				Total	p-value
		<50	50-100	101-200	>200		
Underweight	Yes	2	0	0	3	5	0.078
		18.2%	0.0%	0.0%	60.0%	20.8%	
	9	5	3	2	19		
	81.8%	100%	100%	40.0%	79.2%		
Normal	No	11	5	3	5	24	0.747
		100%	100%	100%	100%	100%	
	8	9	0	2	19		
	30.8%	34.6%	0.0%	50.0%	33.9%		
Overweight	No	18	17	0	2	37	0.000
		69.2%	65.4%	0.0%	50.0%	66.1%	
	26	26	0	4	56		
	100%	100%	0.0%	100%	100%		
Overweight	Yes	0	0	7	0	7	0.000
		0.0%	0.0%	63.6%	0.0%	17.5%	
	20	9	4	0	33		
	100%	100%	36.4%	0.0%	82.5%		
Total	20	9	11	0	40	100%	
	100%	100%	100%	0.0%	100%		

DISCUSSION

In our study, we found that 57 (47.5%) had <50 dialysis sessions, 40 (33.3%) had 50-100 sessions, 14 (11.67%) had 101-200 sessions and 9 (7.5%) had >200 sessions. In patients with <50 dialysis, 10 (17.5%) had HCV, patients with 50-100 dialysis, 9 (22.5%) had HCV, patients with 100-200 dialysis, 7 (50%) had HCV and patients with >200 dialysis, 5 (55.6%) had HCV. The difference was significant (p<0.05).

HCV is caused by blood borne pathogen the HCV. In the study, there were 28 (46.7%) patients who had <50 dialysis, 22 (36.7%) had 50-100 dialysis, 6 (10%) had 100-200 dialysis while 4 (6.7%) cases had >200 dialysis. About 28% frequency of HCV caused by dialysis was reported in Pakistani population. In patients with <50 dialysis, 21.42% had HCV, patients with 50-100 dialysis, 22.72% had HCV, patients with 100-200 dialysis, 16.66% had HCV and patients with >200 dialysis, 50% had HCV.⁶

In another study, a total of 102 CKD patients on HD was studied. All the patients were tested for anti-HCV. The overall prevalence of HCV infection was 23.5%. The longer a patient is on HD, the more susceptible they are to HCV acquisition. It is recommended that HD patients should be monitored in order to determine the full risk factors for HCV contamination.⁷

In developing countries the prevalence is high as showed by studies done in Taiwan, the prevalence was 16.1%. In Pakistan prospective cross-sectional study at the dialysis unit of Sindh Institute of Urology in 2010 showed that among 1220 patients going through hemodialysis 124 were hepatitis positive (prevalence at 10.2%). In Kenya a Cross-sectional descriptive study was conducted in 2003 at Kenyatta national hospital, among 100 patients undergoing dialysis, hepatitis B was found in 8 patients (8%) and hepatitis C in 5 patients (5%). In India, study by Christian medical college in 2001 from the all patients who undergoing dialysis at the time of the study 29% of them were hepatitis B positive and about 20% were hepatitis C positive. In Arab countries 23.7% in Sudan, 71% in Kuwait and 41% in Tunisia, Egypt the prevalence of HCV in hemodialysis patient ranges from 52.3 to 82%. In a joint study by Saudi Arabia and Bahrain in 2004 showed 7.4% of hemodialysis patient were HCV positive compared to 14.7% how HBV were positive. In developed countries in USA study showed only 0.3% of the patient were HCV positive. In Canada 1998 study done in Alberta and showed that hepatitis C infection in hemodialysis patients were 6.5% and HBV were only 1.2%.^{8,9}

In this study, the mean age of patients was 47.47 ± 18.65 years. Data was stratified for age of patients. In patients aged 18-30 years, in cases with <50 dialysis, 3 (27.3%) had HCV, cases with 50-100 dialysis, 1 (10%) had HCV, cases with 100-200 dialysis, 5 (83.3%) had HCV and cases with >200 dialysis, 2 (100%) had HCV. The difference was significant ($p < 0.05$). In patients aged 31-60 years, in cases with <50 dialysis, 6 (21.4%) had HCV, cases with 50-100 dialysis, 4 (25%) had HCV, cases with 100-200 dialysis, 1 (14.3%) had HCV and cases with >200 dialysis, 1 (25%) had HCV. The difference was insignificant ($p > 0.05$). In patients aged 61-80 years, in cases with <50 dialysis, 1 (5.6%) had HCV, cases with 50-100 dialysis, 4 (28.6%) had HCV, cases with 100-200 dialysis, 1 (100%) had HCV and cases with >200 dialysis, 2 (66.7%) had HCV. The difference was significant ($p < 0.05$).

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200 dialysis, 7 (63.6%) had HCV. The difference was significant ($p < 0.05$).

CONCLUSION

The frequency of HCV was significantly higher in patients with >100 sessions of dialysis as compared to <100 dialysis sessions. Now the study results showed that with the increasing number of dialysis, the risk of HCV increases. We have confirmed the extent of problem in local population and get current evidence. Now we will implement the results of this study in future, which could help us in planning better management protocols and regular screening of dialysis patients for HCV on regular basis.

REFERENCES

1. Alkhan AA. Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Infections among Hemodialysis Patients. *General Medicine: Open Access* 2015;1-5.
2. Marinaki S, Boletis JN, Sakellariou S, Delladetsima IK. Hepatitis C in hemodialysis patients. *World J Hepatol* 2015;7(3):548-58.
3. Etik DO, Ocal S, Boyacioglu AS. Hepatitis C infection in hemodialysis patients: A review. *World journal of hepatology* 2015;7(6):885.
4. Monsalve-Castillo F, Gómez-Gamboa L, Chacin-Bonilla L, Porto-Espinoza L, Costa-León L. Hepatitis C virus infection in hemodialysis patients in Maracaibo, Venezuela. *Revista do Instituto de Medicina Tropical de São Paulo* 2012;54(1):53-5.
5. Fabrizi F. Hepatitis C virus infection and dialysis: 2012 update. *ISRN nephrology* 2012;2013.
6. Anwar K, Imran M, Shahzad F, Noreen M, Atif M, Ahmed F, et al. Prevalence of Hepatitis B and Hepatitis C Infection among Patients Undergoing Dialysis. *J Human Virol Retrovirol* 2016;3(3):94-.
7. Chigurupati P, Subbarayudu S, Babu S. Study of incidence of hepatitis C virus infection in hemodialysis patients. *Annals of Tropical Medicine and Public Health* 2014;7(3):167-70.
8. Elshafie SS. The prevalence of hepatitis B surface antigen in the Gezira (Sudan). *Afr J Med Med Sci* 1992;21:61-3.
9. Alkhan AA. Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Infections among Hemodialysis Patients. *Gen Med* 2015;3(1):165.