

Frequency of Hepatitis C Virus in Chronic Kidney Disease Patients on Regular Hemodialysis at Tertiary Care Hospital

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ABSTRACT

Introduction: Chronic kidney disease is the most important public health issue affecting about 10% of the world adult population.

Objective: To assess the frequency of Hepatitis C Virus in chronic kidney disease patients on regular hemodialysis at tertiary care hospital, Peshawar

Methodology: This was descriptive cross sectional study, carried out at the Medicine department, Hayatabad Medical Complex, Peshawar for one year duration from December 2020 to December 2021. A total of 211 patients were observed in our study. All the data was statistically analyzed by using SPSS 23.

Results: In our study, there were 140 (66.4%) male patients while female patients were 71(33.6%). Based on duration of illness, 149(70.6%) patients were in illness duration of 1-2 years while 62(29.4%) patients were observed in illness duration of more than 2 years (Table 1). The overall frequency of Hepatitis C virus was 68(32.2%) in patients with chronic kidney disease on regular hemodialysis

Conclusion: In hospitalized CKD patients, the occurrence of hepatitis C ELISA antibody is considerably higher. To avoid hepatitis C infection spread, rigorous global infection control strategies must be applied in nephrology units. More research is required to evaluate whether detecting and treating hepatitis C in CKD patients reduces death rates or delays advancement to end-stage renal disease.

Key words Hepatitis C Virus; Chronic kidney disease; Hemodialysis

INTRODUCTION

Chronic kidney disease is the most important public health issue affecting about 10% of the world adult population ¹. Diabetes and hypertension are the most common causes of chronic kidney failure. Chronic kidney failure or end stage renal disease is usually treated by renal replacement therapy. Hemodialysis is one the renal replacement therapy used for the removal of the toxic waste products from the blood. Hemodialysis is recommended three or twice a week for a session of about 4 hours. The blood is removed through arterio-venous fistula or a dialysis catheter from the body ^{2,3}.

Patients who undergo hemodialysis are at risk of developing viral infections like hepatitis C, Hepatitis B and human immunodeficiency virus. Due to a lack of conventional preventative procedures, efficient immunization, and contaminated and/or cross-contaminated dialysis equipment, patients on hemodialysis are at a significant risk of infection. Hepatitis C is one of the viral infection associated with chronic kidney failure in patients who are on hemodialysis ^{4,5}.

Hepatitis C is a viral infection caused by single stranded RNA virus from the family of Flaviviridae and is a prevalent pathogen causing morbidity and mortality worldwide ⁶. About 143 million total cases worldwide and 1.7 million new cases were reported in 2015 worldwide ⁶. HCV infection independently increased mortality of patients with CKD ^{7,8}. Hepatitis C has been studied in hemodialysis patients in many epidemiological investigations. Hepatitis C is present in 16.4% to 44.1 % of hemodialysis patients in Pakistan ^{9,10}.

Based on literature, it has been observed that chronic hepatitis C is associated with chronic kidney disease patients undergoing hemodialysis. This let us think to consider the objective of determining the frequency of Hepatitis C Virus in CKD patients undergoing regular hemodialysis. As no such study had been done in our population for the past five years, therefore this study will provide us the latest and updated information about the magnitude of Hepatitis C Virus patients undergoing regular hemodialysis in the population.

MATERIALS AND METHODS

This was descriptive cross sectional study, carried out at the Medicine department, Hayatabad Medical Complex, Peshawar for duration of one year duration from December 2020 to December 2021. The inclusion criteria for our study were all the patients, of both the gender, with chronic kidney disease on hemodialysis having age ranged from 18-60 years. Patients having stage 4 or 5 chronic kidney failure were included. Exclusion criteria for our study were all patients with hematological malignancies, anemia, IV Drug abuser. Study approval was taken from the ethical and research committee of the hospital. A total of 211 patients were observed to find out the frequency of Hepatitis C Virus in chronic kidney disease patients. The purpose and benefits of the study were explained to patients and they were assured about the risks and benefits involved and that the study were done purely for research and data publication and if agree upon a written informed consent were obtained. Chronic kidney diseases were confirmed by estimating reduction in glomerular

filtration rate (GFR) below 30 mL/min/1.73 m² for more than 3 months calculated by using Modification of Diet in Renal Disease (MDRD) study equation. 5 CC of blood were obtained in all the patients and were immediately sent to the hospital laboratory for detecting Anti-HCV Antibody assessed by using the third generation Enzyme Linked Immuno-Sorbent Assay (ELISA) method in the hospital laboratory with cutoff value of > 2.00 (Biokit, Strip Reader). All the laboratory investigations were done from single hospital laboratory under supervision of single pathologist having minimum of five years of experience. Information like age, gender, weight (KG), height(Cm), BMI, residency (urban/rural), duration of chronic kidney disease, hepatitis C virus status were documented on a pre-design Performa.

All the data were analyzed in SPSS version 23. Mean and standard were computed for Quantitative variables like age, height, BMI, and disease duration. Frequencies and percentages were calculated for quantitative variables like gender, residency, and hepatitis C virus. All the results were presented on tables and graphs.

RESULTS

In our study there were 211 chronic kidney disease patients on regular hemodialysis. Based on age wise distribution, 7 (3.3%) patients were in age group 18- 30 years, 33(15.6%) in age group 31-40 years, 86(40.8%) in age group 41-50 years while 85(40.3%) patients were observed in age group 51-60 years.

Table 1: Demographic and Clinical features of the chronic kidney disease patients

| Parameter | Sub-category | Frequency | Percentage |
|---------------------|--------------|-----------|------------|
| Age | 18-30 Years | 7 | 3.3 |
| | 31-40 Years | 33 | 15.6 |
| | 41-50 Years | 86 | 40.8 |
| | 51-60 Years | 85 | 40.3 |
| Gender | Male | 140 | 66.4 |
| | Female | 71 | 33.6 |
| Duration of illness | 1-2 Years | 149 | 70.6 |
| | >2 Years | 62 | 29.4 |
| BMI status | Underweight | 10 | 4.7 |
| | Normal | 38 | 18.0 |
| | Overweight | 112 | 53.1 |
| | Obese | 51 | 24.2 |
| Status of residence | Urban | 152 | 72.0 |
| | Rural | 59 | 28.0 |

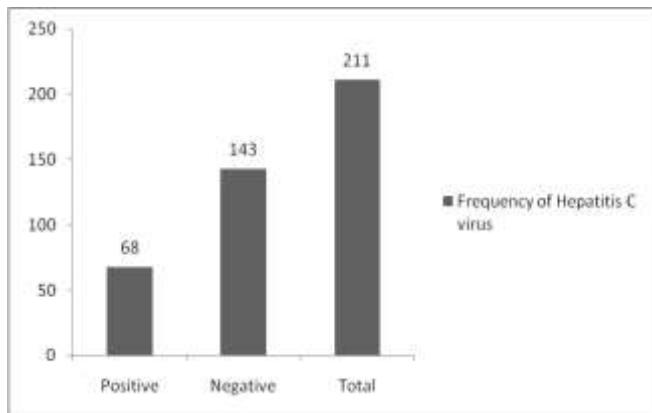


Figure 1: Frequency of Hepatitis C virus in chronic kidney patients

The mean (SD) age was 52 years (2.16). There were 140 (66.4%) male patients while female patients were 71(33.6%). Based on duration of illness, 149(70.6%) patients were observed in illness duration of 1-2 years while 62(29.4%) patients were observed in illness duration of more than 2 years (Table 1). The overall frequency of Hepatitis C virus was 68(32.2%) in patients with chronic kidney disease on regular hemodialysis (Figure 1)

DISCUSSION

Patients who undergo hemodialysis are at risk of developing viral infections like hepatitis C, Hepatitis B and human immunodeficiency virus. Due to a lack of conventional preventative procedures, efficient immunization, and contaminated and/or cross-contaminated dialysis equipment, patients on hemodialysis are at a significant risk of infection. Hepatitis C is one of the viral infection associated with chronic kidney failure in patients who are on hemodialysis ^{4, 5}. The prevalence of Hepatitis C virus in CKD patients varies according to geographical location. In our study, the overall frequency of Hepatitis C virus was 68(32.2%) in patients with chronic kidney disease on regular hemodialysis. This prevalence was high than previous Italian study, who reported 6.25% prevalence of hepatitis C in CKD patients ¹¹. Another study done in Spain also reported low prevalence than our study ¹². A previous study reported comparable results to our study ¹³. The disparity in findings is most likely explained by differences in the prevalence of hepatitis C in different geographic locations, differences in the time periods of different studies, differences in the techniques used to detect hepatitis C antibodies, and differences in the practice of infection control strategies in numerous countries. In Pakistan, the prevalence of hepatitis C antibodies was reported to be between 23.7 to 56.6 % in hemodialysis patients ¹⁴⁻¹⁶. The findings of our research have a number of ramifications. When patients with chronic kidney disease are hospitalized, strong universal infection control measures should be implemented to avoid the spread of disease among other patients and healthcare personnel. It has also been shown that those with hepatitis C are more likely to have CKD ¹⁷. Patients with chronic kidney disease (CKD) may benefit from early detection and treatment of hepatitis C, though this must be confirmed in randomized controlled studies. There are few limitations in our research. This is a small sample size single-center study on hospitalized CKD patients. Patients with CKD who are evaluated in out-patient settings may not benefit from the findings. Furthermore, in our CKD sample, we were unable to find any unique risk factors for hepatitis C infection. For the majority of patients with hepatitis C ELISA antibodies, hepatitis C PCR findings were available, although not for all of them.

CONCLUSION

In hospitalized CKD patients, the occurrence of hepatitis C ELISA antibody is considerably higher. To avoid hepatitis C infection spread, rigorous global infection control strategies must be applied in nephrology units. More research is required to evaluate whether detecting and treating hepatitis C in CKD patients reduces death rates or delays advancement to end-stage renal disease.

REFERENCES

1. Khan S, Iqbal S, Khan MN, Khan MN. Left Ventricular Hypertrophy among Non-Diabetics Pre Dialysis Patients with Chronic Kidney Disease in Local Population. *Research on Health Benefits of Coconut*. 2021;32(8):76.
2. Khan AZ, Alam SA, Mahmood MBUR, Khan RA, Ikram T. The frequency of infections of arteriovenous fistula in patients on dialysis with chronic kidney disease. *J Med Sci*. 2016;24(4):224-7.
3. Atkins RC. The epidemiology of chronic kidney disease. *Kidney Int*. 2005;67:S14-S8.
4. Hsu C-Y, McCulloch C, Fan D, Ordonez J, Chertow G, Go A. Community-based incidence of acute renal failure. *Kidney Int*. 2007;72(2):208-12.
5. Jafar TH. The growing burden of chronic kidney disease in Pakistan. *The New England journal of medicine*. 2006;354(10):995.
6. Barsoum RS. Chronic kidney disease in the developing world. *N Engl J Med*. 2006;354(10):997-9.
7. Gomes A, Schmidt R, Wish J. Re-envisioning Fistula First in a patient-centered culture. *Clin J Am Soc Nephrol*. 2013;8(10):1791-7.
8. Maya ID, Oser R, Saddekni S, Barker J, Allon M. Vascular access stenosis: comparison of arteriovenous grafts and fistulas. *Am J Kidney Dis*. 2004;44(5):859-65.
9. Sharafuddin MJ, Kadir S, Joshi SJ, Parr D. Percutaneous balloon-assisted aspiration thrombectomy of clotted hemodialysis access grafts. *J Vasc Interv Radiol*. 1996;7(2):177-83.
10. Himmelfarb J, Saad T. Hemodialysis vascular access: emerging concepts. *Curr Opin Nephrol Hypertens*. 1996;5(6):485-91.
11. Minutolo R, Aghemo A, Chirianni A, Fabrizi F, Gesualdo L, Giannini EG, et al. Management of hepatitis C virus infection in patients with chronic kidney disease: position statement of the joint committee of Italian association for the study of the liver (AISF), Italian society of internal medicine (SIMI), Italian society of infectious and tropical disease (SIMIT) and Italian society of nephrology (SIN). *Dig Liver Dis*. 2018;50(11):1133-52.
12. Martin P, Fabrizi F. Hepatitis C virus and kidney disease. *J Hepatol*. 2008;49(4):613-24.
13. Turmel-Rodrigues L, Pengloan J, Rodrigue H, Brillat G, Lataste A, Pierre D, et al. Treatment of failed native arteriovenous fistulae for hemodialysis by interventional radiology. *Kidney Int*. 2000;57(3):1124-40.
14. Khokhar N, Alam AY, Naz F, Mahmud SN. Risk factors for hepatitis C virus infection in patients on long-term hemodialysis. *J Coll Physicians Surg Pak*. 2005;15(6):326-8.
15. Shahbaz M. Data from a large hemodialysis center from an industrial city: Demographics, etiology and hepatitis status. *Pakistan Journal of Kidney Diseases*. 2019;3(10).
16. Mandhwani R, Hanif FM, Lail G, Luck NH, Khalid MA, ul Haque MM, et al. Use of sofosbuvir based regimen in patients with end-stage renal disease and chronic hepatitis C; an open label, non-randomized, single arm, single center study from Pakistan. *Gastroenterology and hepatology from bed to bench*. 2020;13(2):141.
17. Henson JB, Sise ME, editors. The association of hepatitis C infection with the onset of CKD and progression into ESRD. *Seminars in dialysis*; 2019: Wiley Online Library.