

ORIGINAL ARTICLE

Management of HCV Positive Patients on Maintenance DialysisSAMEE ULLAH KHAN¹, IRFAN ELAHI², RIZWAN MUNIR AHMED³, AELIYA BATOOL⁴, SHAJIA HAIDER⁵, OLIVA ARAUJOM⁶¹Assistant Professor of Nephrology, Sahiwal Teaching Hospital, Sahiwal²Assistant Professor of Nephrology, King Edward Medical University, Lahore³Associate Consultant Nephrology, King Saud Medical City, Riyadh^{4,5}Lecturer Department of Pharmacology, Karachi Medical and Dental College (KMDC), Karachi⁶MD, Pasteur Clinic Quito, EcuadorCorresponding author: Samee Ullah Khan, Email: drsami119@gmail.com**ABSTRACT**

The prevalence of hepatitis C virus (HCV) is quite high in Pakistan, especially among patients on maintenance hemodialysis (MHD). HCV infection is associated with increased morbidity and mortality among patients on maintenance hemodialysis. The current availability of direct-acting antiviral therapy has changed the picture of HCV prevalence in many countries.

Objective: The aim of our study is to assess the prevalence and treatment of HCV infection among patients on maintenance hemodialysis in our setting.

Methods: This descriptive cross-sectional study was held in the Medicine department of Mayo Hospital, Lahore for six-months duration from 13th January 2022 to 12th July 2022. The study was conducted on 130 patients to assess HCV seroprevalence among patients on MHD. Data on HCV status, PCR positivity and number of patients receiving active treatment were evaluated.

Results: A total of 130 patients on maintenance hemodialysis were included in this study. The incidence of HCV infection was 49 (37.7%). All patients underwent PCR and 32 patients were PCR positive. All except 5 of the 32 PCR positive patients started HCV antiviral treatment.

Conclusions: In conclusion, our study helps highlight the high prevalence of HCV among maintenance hemodialysis patients and the need to maintain adequate infection control measures. However, it is encouraging to know that most patients have been treated, and future research will highlight the importance of prompt treatment for MHD patients. It is recommended that all of HCV PCR positive patients were being treated with DAA.

Keywords: HCV, Hemodialysis, Antivirals, Seroconversion, Health insurance, Infection.

INTRODUCTION

There are more than 130-150 million patients worldwide who are infected with hepatitis C virus¹. Renal involvement by HCV is common, 46% of HCV-positive patients have proteinuria, and in a study of patients with glomerulonephritis, 39% of patients had latent HCV infection². The prevalence of HCV positive among dialysis patients varies from less than 5% to 60% in different parts of the world³. Chronic kidney disease can cause various types of liver damage; however, drug-induced liver injury is common due to kidney failure, although hepatitis C remains a moderate cause of liver disease in the hemodialysis population⁴⁻⁵. A recent meta-analysis by Su et al. the incidence of hepatitis C infection among hemodialysis patients was directly related to the socio-economic status of the country⁶. While the rate of HCV positive patients was 4.44 per 100 patients in developing countries, it was only 0.97 per 100 patients in developed countries⁷. Another study from Taiwan showed that the incidence of chronic kidney disease (CKD) in HCV-positive patients is 16.5% and is a separate and independent risk factor for developing chronic kidney disease in the future⁸⁻⁹. Patients undergoing renal treatment such as hemodialysis become infected with HCV, often from pathogens on the surface of bedside items or through blood-borne infections from sharing contaminated medical equipment¹⁰. Such incidents are more common in developing countries such as Pakistan, India and Bangladesh where strict universal measures are ignored¹¹. The management of HCV has changed drastically with the latest drug approvals from the FDA. Direct-acting antivirals (DAAs) targeting different HCV lifecycles, telaprevir and boceprevir, originally approved for the treatment of HCV genotype 1, are now available for all genotypes and are available in various formulations and combinations¹². With the introduction of the latest health insurance in Pakistan, giving every person free access to healthcare facilities, including chronic diseases such as HCV, has provided an opportunity to eradicate HCV¹³. In the current cross-sectional study, we collected data from our dialysis unit evaluating HCV treatment in patients on maintenance hemodialysis (MHD). Our goal was to document the proportion of HCV-infected patients who were on MHD.

METHOD

This cross-sectional study was held in the Medicine department of Mayo Hospital, Lahore for six-months duration from 13th January

2022 to 12th July 2022. The study was conducted on 130 patients to assess HCV seroprevalence among patients on MHD and all patients were adults over 18 years of age. The data were collected after appropriate patient consent and hospital management approval. A simple questionnaire was designed and used to collect data, including patient characteristics such as gender, age, marital status, employment history and any medical conditions such as hypertension and diabetes. More detailed data on their treatment, pre- and post-treatment PCR have been documented among HCV-positive patients. We also document the level of education, financial support from the state or self-payment for treatment. All data were collected by physicians who were well informed about the scope of the study to ensure consistent and relevant results. Participants with a positive ELISA test result were considered HCV positive. All patients underwent PCR. DAA administration was evaluated among PCR-positive patients from patient's hospital profile. Compliance was assessed according to patient's hospital treatment profile.

The statistical analysis of the study was based on continuous metric variables such as mean, mode, median, and standard deviation, and some categorical variables were presented as percentages. All analyzes were performed using SPSS 21 and Microsoft Excel.

RESULTS

A total of 130 patients on maintenance hemodialysis were included in this study. The incidence of HCV infection was 49 (37.7%). The general characteristics of the patients are shown in Table 1.

Table-1: shows the clinical features of HCV positive patients on maintenance hemodialysis, n=49

| Age Group (years) | No (%) |
|-------------------------|-----------|
| 18-30 | 13(26.5%) |
| 31-45 | 18(36.7%) |
| 46-60 | 14(28.6%) |
| 61-75 | 4(8.2%) |
| Gender | |
| Males | 32(65.3%) |
| Females | 17(34.7%) |
| Co-Morbidities | |
| Diabetes & Hypertension | 29(59.2%) |
| Diabetes | 21(42.8%) |

All patients underwent PCR and 32 patients were PCR positive. All except 5 of the 32 PCR positive patients started HCV antiviral treatment. DAAT drugs were provided through the state's recently introduced health insurance program. The compliance rate was 100% in this study Table 2.

Table-2: shows the clinical features of HCV positive patients by PCR on maintenance hemodialysis, n=32

| Age Group (years) | HCV Positive patients on DAAT treatment, N= (27) | HCV Positive patients, no treatment taken, N= (5) |
|-------------------|--|---|
| 18-30 | 3 | 0 |
| 31-45 | 10 | 1 |
| 46-60 | 12 | 2 |
| 61-75 | 2 | 2 |
| Gender | | |
| Males | 16 | 4 |
| Females | 11 | 1 |

DISCUSSION

HCV infection is very common in patients with MHD, accounting for approximately 32.3% in a systematic review; however, there are no studies on HCV management issues in these patients in Pakistan¹⁴. Our results show that MHD patients have high HCV prevalence of 37.7%. Seroconversion among hemodialysis patients is a major concern among MHDs, especially in low socioeconomic countries, including Pakistan. A recent study by Hussain et al. in Sheikhpura, Pakistan showed an alarming seroconversion rate of 53.7% among patients on maintenance hemodialysis¹⁵. One of the main reasons for the high rate of seroconversion they reported was failure to comply with common infection control measures, not socioeconomic issues. Among our 49 HCV patients, 32 were PCR positive and represented a potential source of transmission to other MHD patients or the general population, including their own household. Fortunately, due to the availability of DAA therapy for HCV patients, all were treated except 5. A study in neighboring India documented the accumulation of HCV in households¹⁶. The KDIGO guidelines rightly emphasize screening for active HCV infection in patients with MHD, as remission is possible in almost 95% of patients¹⁷. If universal infection control measures are followed, HCV eradication will significantly reduce the likelihood of HCV transmission¹⁸. However, the availability of DAA treatment should be ensured and universal precautions must be taken in MHD units to reduce HCV transmission¹⁹. Treatment of HCV with DAA therapy is not limited to treating HCV and preventing cirrhosis; instead, it has far-reaching effects on the health of patients and their families. Any patient infected with HCV can be a source of transmission in the community, and treating only one patient will prevent further spread of the virus²⁰. A great study by Hsu et al, Type 2 diabetes patients in Taiwan were divided into three groups, the first group was treated with Peg interferon and ribavirin, the second group was untreated, and the third group was a control group. After eight years of follow-up, the incidence of heart disease and end-stage renal disease was lower in the group treated with interferon Peg and ribavirin compared with the other groups. This study highlights the health effects of HCV infection beyond liver involvement²¹. Pakistan is battling infectious diseases and is one of 22 countries currently trying to develop strategies to combat HCV and it seems that with current health policy this is not possible²². We are pleased that all our patients infected with HCV with a positive PCR result are covered by the new insurance policy. Only five patients had not yet been treated for personal reasons other than the availability of medication or support. Among these patients, counseling can increase the compliance to 100%. The introduction of the health insurance program has brought significant changes in the treatment of chronic diseases²³.

Such insurance programs are only effective by raising public awareness and solving problems of easy access to hospitals and providers. This was clearly demonstrated in a study by Cheem et al., where resource utilization was only 0.42% in the Pakistani

province of Sindh, where a readily available microfinance health support plan was implemented²⁴. Therefore, increased public awareness and administrative issues are likely to translate into better management of chronic diseases, including HCV, both in the general population and in patients with MHD²⁵.

Our study has several limitations; Being a single-centre, cross-sectional study still poses significant challenges in the management of patients with MHD. We did not specifically ask about seroconversion, whether before or after starting dialysis, which could inform infection control practices in our dialysis unit. HCV prevalence among resource-constrained countries was almost similar to that reported in the literature. Needless to say, the benefits of DAAT will emerge in the next few years; with the seroconversion rate significantly decreasing in the future as the number of infectious HCV infections decreases. Another limitation of our study is the lack of post-treatment PCR HCV data, but we plan to analyze remission rates and type of drug protocol for DAAT as a long-term follow-up study.

CONCLUSION

In conclusion, our study helps highlight the high prevalence of HCV among maintenance hemodialysis patients and the need to maintain adequate infection control measures. However, it is encouraging to know that most patients have been treated, and future research will highlight the importance of prompt treatment for MHD patients. It is recommended that all of HCV PCR positive patients were being treated with DAA.

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