

Prevalence of Hepatitis C Infection among Patients of Chronic Kidney Disease in a Tertiary Care Hospital of Western Uttar Pradesh

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Abstract

Introduction: Chronic kidney disease (CKD) and Hepatitis C, both are menacing public health problems, Hepatitis C virus (HCV) can easily be transmitted via haemodialysis. HCV leads to greater mortality and morbidity due to cirrhosis, while also increasing the progression of CKD. The aim of this study was to determine the prevalence of HCV infection among patients of CKD.

Methods: It was a cross-sectional study of CKD patients who were admitted in Medicine department in LLRM Medical College, Meerut, which is a tertiary care center in Western UP. Proper clinical history and laboratory investigations were noted and testing for HCV infection was conducted in all patients. Diagnosis of HCV was confirmed by HCV RNA (RT PCR) and positive Anti HCV IgG antibody.

Results: Total 146 patients of CKD were included in the study out of which 54.50% were males and 44.50% were females. Most of the patients were in age group 35 - 50 years (52.05%). Our study showed prevalence of HCV in CKD patients to be about 6.84% with male predominance.

Conclusions: Prevalence of HCV infection in CKD patients is high as compared to the general population. Screening for HCV with HCV RNA (RT PCR) is recommended. Strict precautions should be taken in hospitals and dialysis units to prevent its transmission.

Key words: Chronic kidney disease, prevalence, Hepatitis C.

Introduction

Currently India has around 10 - 15 million people infected with Hepatitis C virus (HCV) with a prevalence of 0.5 - 1.5%¹. In renal replacement therapy units, HCV infection is a significant cause of morbidity and mortality among haemodialysis (HD) patients, and management of such patients becomes complicated in view of HCV infection. The prevalence of HCV among dialysis patients in India is reported to range between 10% and 40%²⁻⁷.

For patients with severe renal impairment, acute renal failure, and stage IV chronic kidney disease, HD is a simulated way of maintaining homeostasis in the body. Many patients undergo dialysis for prolonged periods of time and are exposed to various side-effects as a consequence of dialysis. The spread of HCV to patients on HD is generally hospital acquired and potential risk factors include failure to disinfect devices, sharing of single-use vials for infusion, improper techniques, contaminated dialysis equipment, and supplies, contamination by attending personnel. However, long-standing vascular exposure and manifold blood transfusions also increases the risk.

The aim of these study was to estimate the prevalence of Hepatitis C infection among patients of CKD and to compare the prevalence of HCV infection in CKD patients on

maintenance HD with those CKD patients not on maintenance HD.

Material and Methods

The study was conducted in SVBP Hospital, Meerut, (UP) during the period of one year. It was cross-sectional, single centre study.

All cases in the study were admitted in the hospital and evaluated for hepatitis C infection. The study included consenting adult patients of CKD and excluded CKD patients who had any haematological disorder or HIV infection.

A questionnaire was made to ensure proper data collection. The data collected included age, sex, occupation, duration of haemodialysis, number of blood units transfused, history of hypertension or diabetes mellitus.

1. Cut-off for CKD was defined as:

GFR (eGFR) less than 60 mL/min/1.73 m² (GFR category G3a - G5) or,

Persistent proteinuria by urinary dipstick for 3 months or more⁸.

2. eGFR was calculated by CKD-EPI creatinine equation

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$141 \times \min(\text{Scr}/\kappa, 1) \alpha \times \max/\kappa \times \max(\text{Scr}/\geq, 1) - 1.209 \times 0.993 \text{ age} (\times 1.018 \text{ if female}) (\times 1.159 \text{ if black}).$

Scr = standardised serum creatinine in mg/dL

$\kappa = 0.7$ (females) or 0.9 (males)

$\alpha = -0.329$ (female) or -0.411 (male)

$\min(\text{Scr}/\kappa, 1)$ is the minimum of Scr/κ or 1.0

$\max(\text{Scr}/\kappa, 1)$ is the maximum of Scr/κ or 1.0 age (years)⁸.

- The diagnosis of HCV was made via HCV RNA (RT - PCR) and /or positive AntiHCV IgG serology (3rd Gen ELISA) and was done in all patients.

Results

A total of 146 patients were included in the study. Majority of the patients were in the 18 - 65 year age group. Of all the patients of CKD, 54.50% were males and 44.50% females (Table I and II).

Out of all CKD patients most were in the age group 35 - 50 years (52.05%), followed by those >65 years (17.80%) followed by 50 - 65 years (22.60%) and the least number of patients were in age group >18 - 35 years of about 7.53%.

Out of these patients, 51.36% were on MHD and 48.63% were not on MHD (Table XIII). In the patients of CKD on MHD, 18 - 65 year age group was about 81.70% and 18.70% were in age group >65 years. Males in this group contributed about 50.70% and females were about 49.30% (Table III and V). In the patients of CKD not on MHD, 18 - 65 year age group was about 83% and 17% were in age group >65 years. Males in this group contributed about 60.60% and females were about 39.40% (Table IV and VI).

In the patients of CKD on MHD, HCV positive status was found in 9.33%, out of which, 18 - 65 year age group was 100% and no patients were in age group >65 years. Males in this group contributed about 57.10% and females were about 42.90% (Table IX and X).

In patients of CKD not on MHD, 4.22% patients were found to be HCV positive, out of which all patients were of age group 18 - 65 years. 66.7% were males and 33.3% were females (Table VII and VIII).

Total number of patients found to be HCV positive were 6.84%, all were from age group 18 - 65 years. Of this group males were about 60% and females were about 40% (Table XI and XII).

There was no association between being on MHD and HCV status ($p = 0.062$).

Table I: Age distribution of CKD patients (n = 146).

Age (years)	Patients
>18 - 35	11 (7.53%)
35 - 50	76 (52.05%)
50 - 65	33 (22.60%)
>65	26 (17.80%)
Total	146

Table II: Gender distribution of CKD patients (n = 146).

Gender	Patients
Male	81 (54.50%)
Female	65 (44.50%)
Total	146

Table III: Age distribution of CKD patients on MHD (n = 75).

Age (years)	Patients
>18 - 65	61 (81.30%)
>65	14 (18.70%)
Total	75

Table IV: Age distribution of CKD patients not on MHD (n = 71).

Age (years)	Patients
>18 - 65	59 (83.0%)
>65	12 (17.0%)
Total	71

Table V: Gender distribution of CKD patients on MHD (n = 75).

Gender	Patients
Male	38 (50.7%)
Female	37 (49.3%)
Total	75

Table VI: Gender distribution of CKD patients not on MHD (n = 71).

Gender	Patients
Male	43(60.6%)
Female	28(39.4%)
Total	71

Table VII: Age distribution of CKD patients not on MHD with HCV positive status (n = 3).

Age (years)	Patients
>18 - 65	03 (100%)
>65	00 (0%)
Total	03

Table VIII: Gender distribution of CKD patients not on MHD with HCV positive status (n = 3).

Gender	Patients
Male	02 (66.7%)
Female	01 (33.3%)
Total	03

Table IX: Age distribution of CKD patients on MHD with HCV positive status (n = 7).

Age (years)	Patients
>18 - 65	07 (100%)
>65	00 (0%)
Total	07

Table X: Gender distribution of CKD patients on MHD with HCV positive status (n = 7).

Gender	Patients
Male	04 (57.10%)
Female	03 (42.90%)
Total	07

Table XI: Gender distribution of CKD patients with HCV positive status (n = 10).

Gender	Patients
Male	06 (60%)
Female	04 (40%)
Total	10 (100%)

Table XII: Age distribution of CKD patients with HCV positive status (n = 10).

Age (years)	Patients
>18 - 65	10 (100%)
>65	00 (0%)
Total	10 (100%)

Table XIII: Total distribution of CKD patients with respect to HCV status.

Status	HCV+	HCV(-ve)	Total
On MHD	07 (9.33%)	68 (90.66%)	75 (51.36%)
Not on MHD	03 (4.22%)	68 (90.66%)	71 (48.63%)
Total	10 (6.84%)	136 (93.15%)	146 (100%)

Discussion

This study shows a prevalence of HCV infection among CKD patients of about 6.84%. In patients of CKD not on MHD 4.22% of the patients were HCV reactive and in patients of CKD on MHD 9.33% of patients were HCV reactive. Various other studies have been conducted in India on the prevalence of HCV infection in CKD patients on Renal Replacement Therapy. All these studies indicate high prevalence (10 - 40%)²⁻⁷ which do not corroborate with the prevalence of 9.33% in this study. This study shows prevalence of HCV in CKD patients to be about 6.84%.

In the context of India, the prevalence of Hepatitis C infection in CKD patients in this study is significantly higher than the general population (0.5 - 1.5%)¹. In a study done in Pakistan, by Shafi *et al*, the frequency of Hepatitis C in CKD patients was about 27.2%⁹. In another study done by Fabrizi *et al* in Italy, hepatitis C antibody was seen in 20% of CKD patients¹⁰. Male predominance was seen in our study with 60% of HCV positive patients which is comparable to 69% males in a study done by Arora *et al*, this can be due to higher incidence of CKD per se, and in males owing to higher incidence of diabetes and hypertension. Most common age group was 35 - 50 years, as in other studies, again attributed to high incidence of CKD in this age group¹¹. In this study the prevalence of HCV infection in females was found to be around 40%.

Conclusions

In conclusion, a significant number of chronic kidney disease (CKD) patients (6.84%) have hepatitis C virus (HCV) infection. Studies done previously in India have also shown that prevalence of HCV in CKD patients is about 10% to 40%, which is not seen in this study. This could be due to more advanced screening methods and increased awareness in people about Hepatitis C and CKD in the recent years. This indirectly also shows the increased efficiency of screening methods for Hepatitis C in recent times. Furthermore, this decline could also be due to availability

of separate Dialysis machines for seropositive patients in recent years in dialysis units.

To prevent HCV infection, it is critical to test patients before they start dialysis. Hospitals and dialysis centers should also follow strict safety measures and separate machines should be used for seropositive and seronegative patients.

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