



## PREVALENCE OF HEPATITIS C VIRUS AMONG PATIENTS WITH RENAL FAILURE WHO ARE TREATED IN RENAL DIALYSIS UNITS IN ROYAL MEDICAL SERVICES IN JORDAN

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### ABSTRACT:

**Background:** Hepatitis C virus (HCV) infection is a global health issue, especially for dialysis patients. Dialysis patients have a higher risk of HCV due to their lower immune systems and increased blood product exposure.

**Study objectives:** This study examined HCV infection rates in Jordanian dialysis patients at Royal Medical Services (RMS) facilities.

**Methodology:** The investigation examined former RMS renal dialysis units. Medical records of 300 RMS renal dialysis patients were examined. A valuable Excel spreadsheet with digital source information was used. The researchers analyzed more data with SPSS 25. The HCV frequency rate is the number of positive cases divided by the total number tested. We briefly summarized HCV screening and infection control methods using descriptive data. The relationship between study variables was examined using T-test, and chi-squared analysis. A p-value below 0.05 indicated significance.

**Study findings:** The prevalence of HCV among dialysis patients was 24%. Most patients were males (65%). The mean age of study participants was 56.4±12.8 years age and gender were not significantly associated with the positivity of HCV ( $p>0.05$ ). the creatinine level in HCV positive patients was about 12 mg/dl, and that was significantly higher than that of HCV Negative patients (7.9 mg/dl) ( $p=0.003$ ).

**Conclusion:** The prevalence of HCV among renal dialysis patients in this Jordanian study is consistent with other regional findings, though age and gender do not appear to significantly influence HCV status in this population. The elevated creatinine levels observed in HCV-positive patients highlight the potential for worse renal outcomes.

**Keywords:** Renal dialysis, HCV, creatinine, prevalence, Royal Medical Services

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## 1. INTRODUCTION

Chronic renal failure patients need renal replacement therapy to sustain life (1). Hemodialysis is the most used method because it is effective and affordable (2). However, this method is associated with some possible complications, one of which is infection with the hepatitis C virus, especially in developing countries (3).

Hepatitis C virus is a blood-borne virus, and the infection is chronic, which means it continues for many years if not treated appropriately (4). Hepatitis C infection is considered a global public health problem. Now, it is known that there are more than 170 million people infected with hepatitis C all around the world (Stasi et al., 2024). This accounts for more than 3% of the world population (4). A member of the flavivirus family, hepatitis C virus is a small, enveloped, and positive single-stranded RNA virus (5). There are at least 6 different genotypes and more than 100 different subtypes of hepatitis C virus (6). Transmission of hepatitis C infection is usually through blood transfusion or inoculation of contaminated needles, among others (7). In most countries, the prevalence of hepatitis C is under 2%. However, in some populations with a higher risk, such as drug addicts and hemophiliacs, the prevalence is more than 30% (8). In most of the world, although it is becoming more common to have a negative antibody test, dialysis units usually have infected patients (9). Infection rates among dialysis patients (after adjustment) are about 15-40% (10). Others in the hospital or on the job can get hepatitis C from these people, who often have more than one type. Hepatitis C is more likely to spread than HIV, according to Jose-Abrego et al (11).

As per Forouzannia et al. (12), most new infections in health care situations come from people who already have hepatitis C. In most developing countries, dialysis units are among the last sections in the hospital to get on-site screening and treatment for hepatitis C (13). Since the beginning of court screening in 1990, by means of single-diluent screening, the prevalence of hepatitis C on-site bench-tested patients admitted to the hemodialysis unit is continuously decreasing (14). The percentage of people with persistent hepatitis C who were

brought to the hemodialysis unit was about 8.5%, which is the same as in previous studies (15).

A drop in glomerular filtration rates (GFR) of less than 60 ml/min/1.73 m<sup>2</sup> for three months or more is considered chronic renal failure. A decrease in GFR for less than three months is considered acute renal failure (16). There are two types of renal failure: acute renal failure and chronic renal failure. Patients with renal failure need renal replacement therapy for metabolic control, removal of toxic nitrogenous waste, treatment of fluid overload, and adequate electrolyte balance (17). This therapy can be achieved using either renal dialysis or renal transplantation (17). Dialysis is an artificial process that removes toxic nitrogenous waste products and excess water from the blood. It is done when the kidneys cannot carry out their normal functions, mainly filtration. Hemodialysis and peritoneal dialysis are two types of dialysis (18).

Hemodialysis is a popular way to treat people whose kidneys aren't working properly. Hemodialysis is a commonly used method for treating patients with impaired kidney function. It works by using an artificial kidney, which is a semipermeable membrane, to remove waste products and excess water from the blood (19). In peritoneal dialysis, a fluid is filled in the peritoneal cavity through a catheter. The fluid stays in the cavity for some time to allow soluble waste products and excess water to pass from the blood into the cavity (20). After this, the fluid is drained from the cavity, and it carries away waste products and excess water (Kunin et al., 2022). The biocompatible peritoneal membranes can be used as a natural route of detoxification, equivalent to kidney function (21).

Little literature exists about HCV infection in patients suffering from chronic renal failure in Jordan. The prevalence of HCV among renal failure patients was reported in several studies conducted in different hospitals in Jordan. Hamoudi et al (22) reported the prevalence of HCV among the Jordanian population to be 42%. In these studies, the rates of occurrence were between 16.7% and 80% (23). Most studies found that it was more common in men, older people, and people who were on long-term dialysis (24, 25). The different prevalence rates could be because

the research looked at people of different ages, genders, and risk groups (25).

The goal of this study was to look at the rates of HCV infections in dialysis patients in Jordan who go to Royal Medical Services (RMS) facilities.

## 2. METHODS AND SUBJECTS:

The study looked at renal dialysis units that used to be part of RMS. We looked at the medical information of 300 RMS renal dialysis patients. A valuable Excel spreadsheet with digital source information was used. The researchers analyzed data with SPSS 25. The HCV frequency rate was the

number of positive cases divided by the total number tested. We briefly summarized HCV screening and infection control methods using descriptive data. The relationships between study variables were examined using T-test, and chi-squared analysis. A p-value below 0.05 indicated significance.

## 3. STUDY RESULTS

As shown in Table (1), the general characteristics of study participants were given. A total of 195 participants (65%) were males. The mean age of study participants was 56.4±12.8 years. The prevalence of HCV positivity among renal patients who are exposed to renal dialysis was 24%.

**Table 1: General characteristics of participants (N=300)**

Variable	Number	Percentage
<b>Gender (N, %):</b>		
- Male	195	65%
- Female	105	35%
<b>Age (Mean±SD) years</b>	56.4	12.8
<b>HCV Positive Cases (N, %):</b>		
- Positive	72	24%
- Negative	228	78%

The data presented in Table (2) demonstrated that age and gender were not significantly associated with the positivity of HCV (p>0.05). On the other hand, the

creatinine level in HCV positive patients was about 12 mg/dl, and that was significantly higher than that of HCV Negative patients (7.9 mg/dl) (p=0.003).

**Table 2: Variations between HCV parameters among study participants and their statistical significance**

Variable	HCV Positive Patients (72)	HCV Negative Patients (228)	P value
<b>Age (M±SD)</b>	55.8±14.57	57.6±13.8	0.820
<b>Male</b>	44 (61.11%)	120 (52.63%)	0.430
<b>Female</b>	28 (38.89%)	108 (47.37%)	
<b>Creatinine level (mg/dl)</b>	11.8	7.9	0.003

## 4. DISCUSSION

The findings of this study provide valuable insights into the prevalence of HCV among patients undergoing renal dialysis in Jordan, along with associated clinical factors. The data indicate a 24% prevalence rate of HCV positivity among the study participants, which is notably higher than global averages and aligns with other regional studies within Jordan (23).

### Gender and Age Associations

In this study, neither gender nor age was significantly associated with HCV positivity (p>0.05). This result is consistent with several studies conducted in Jordan, which also found no significant correlation between these demographic factors and HCV infection among dialysis patients (26).

These findings contrast with some international studies where older age has been associated with

higher HCV prevalence, potentially due to longer exposure periods and cumulative risk factors (27). However, the lack of significance in the Jordanian context may reflect effective screening practices or specific epidemiological patterns unique to the region (26).

### Creatinine Levels

A key finding of this study is the significant association between elevated creatinine levels and HCV positivity. HCV-positive patients exhibited a mean creatinine level of 12 mg/dL, significantly higher than the 7.9 mg/dL observed in HCV-negative patients ( $p=0.003$ ). Elevated creatinine levels typically indicate more advanced renal dysfunction, which may be exacerbated by HCV infection (28).

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### 5. CONCLUSION

In summary, the prevalence of HCV among renal dialysis patients in this Jordanian study is consistent with other regional findings, though age and gender do not appear to significantly influence HCV status in this population. The elevated creatinine levels observed in HCV-positive patients highlight the potential for worse renal outcomes, aligning with previous Jordanian studies. These results underscore the critical need for stringent infection control measures, routine HCV screening, and targeted management strategies in dialysis units across Jordan to mitigate the impact of HCV on renal function and improve patient outcomes.

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