

# Prevalence of Hepatitis C in Dialysis Patients in Khyber Teaching Hospital Peshawar

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## ABSTRACT

**Introduction:** The hepatitis C virus (HCV) is a Flaviviridae-related virus that causes a systemic illness that can be transmitted. HCV is a blood-borne infection that primarily affects the liver. HCV diagnosis that is accurate and timely is critical in significantly reducing the risk of morbidity and mortality. The goal of this study was to find out the Hepatitis C in chronic renal failure patients who are on hemodialysis.

**Method:** This descriptive cross-sectional study was carried out in the Dialysis Unit of the Khyber Teaching Hospital (KTH) Peshawar's Department of Nephrology. From September to December 2017, this study took place over four months. The study included a total of 114 patients, regardless of their age or gender. Hepatitis C was detected in whole blood samples collected from 114 healthy people using an immunochromatography method. The data was analyzed using SPSS v.22.

**Result:** The Immunochromatography technique for HCV was used to analyze 114 blood samples from recruited individuals. Male patients were 52.6% of the total, while female patients made up 47.4%. The study found that 24.56% of male patients were positive, while 28.07% of female patients were positive. Overall, the technique's sensitivity and specificity were 83.1% and 72.7%, respectively.

**Conclusion:** It is concluded that the HCV rapid testing is still sensitive and specific for detecting hepatitis C virus, it should be used in routine clinical settings for early hepatitis C virus diagnosis when advanced diagnostic options are restricted.

**Keywords:** HCV, Hepatitis C virus, Nephrology, Dialysis

## INTRODUCTION

Infection with hepatitis C has become a major public health concern around the world, including in Pakistan. According to estimates, there are 170 million people worldwide who are infected with HCV. HCV is a member of the Flaviviridae family. It has a single-stranded RNA genome that is surrounded by a positive extremity<sup>1</sup>. In 1989, the genome of HCV was discovered in plasma from a chimp that had been infected with non-A, non-B Hepatitis virus<sup>2</sup>. HCV can cause a persistent liver infection, which can lead to scarring of the liver (fibrosis) and, in some cases, hepatocellular carcinoma<sup>3</sup>. The virus spreads by direct contact with the blood of an infected individual. According to past clinical event investigations, transfusion of blood materials is one of the most prevalent components in the transmission of hepatitis C illness. Homosexuality and intravenous drug misuse are most likely the additional causes of HCV infection in Pakistan, however they only account for a minor proportion of the total contamination load<sup>4</sup>.

According to a study, other ways HCV spreads include contaminated syringes or needles, face or armpit shaving at group hair-styling salons, vertical transmission, tattooing, non-sexual contact in families, ear puncturing, and improperly sterilised surgical or dental supplies<sup>5</sup>. In patients with persistent renal failure disease, hepatitis C virus contamination is common<sup>6</sup>. Hepatitis C infection is also linked to kidney infections such as membranous nephropathy, Membranoproliferative glomerulonephritis, and polyarteritis nodosa, which can affect the renal vasculature<sup>7</sup>.

In the hemodialysis subordinate population, viral hepatitis may independently contribute to increased dreariness and mortality. The unfavorable effect of viral hepatitis on hemodialysis patients' mortality is set up for hepatitis C infection<sup>8</sup>. In their multicenter study, Fissell *et al.*, found a 13.5 percent prevalence of HCV. The prevalence, however, varied greatly between centres, ranging from 2.6 percent to 22.9 percent. The study omitted data from Asian, African, and Middle Eastern centres, where viral hepatitis is more frequent in the general population<sup>9</sup>. The prevalence, on the other hand, ranged from 2.6 percent to 22.9 percent depending on the topic. Data from Asia, Africa, and the Middle East were removed because viral hepatitis is more common in the general population<sup>10</sup>.

Hepatitis C seropositivity in Pakistani hemodialysis users is predicted to range between 23.7 and 68 percent<sup>11</sup>. Because these patients are constantly exposed to viral contamination risk factors, the prevalence of viral hepatitis increases with the duration of hemodialysis<sup>12</sup>. Given the effects of viral hepatitis in chronic renal failure patients, it is important to collect epidemiological data, identify cause, and establish responses and treatment systems in all chronic renal failure populations. This study intends to uncover the truth about the frequency of hepatitis C disease in our area CKD dialysis subordinate community, as well as to establish the typical risk factors for these contamination issues. This examination will also include an evaluation of the important contamination control procedures put in place in diverse dialysis units. The prevalence of these viral

infections in our hemodialysis subordinate population might then be lowered by modifying recognised risk variables<sup>13</sup>.

Chronic renal diseases patients on haemodialysis are at a higher risk of getting Hepatitis C due to a number of risk factors connected with the disease and the therapeutic options. Intravenous infusions, blood transfusions, surgical intercessions, hemodialysis facility cleaning and sanitation policies, and hemodialysis methodology are only a few of the risk factors. This population is projected to have a higher prevalence than the whole inclusive society. The purpose of this study was to find out how common Hepatitis C is in people who have chronic kidney disease. The goal of this study was to determine the prevalence of Hepatitis C in chronic renal failure patients receiving hemodialysis.

**MATERIALS AND METHODS**

This descriptive cross-sectional research was performed out at Khyber Teaching Hospital (KTH) Peshawar's Department of Nephrology, Dialysis Unit. This study lasted four months, from September to December of 2017. A total of one hundred and fourteen patients were included irrespective of age and gender. All patients suffering from chronic kidney disease and on hemodialysis supportive treatment were included in the study. Patients with chronic kidney disease but not on supportive treatment were excluded from the study. Written informed consent was taken from all the participants included in the study.

The patient's data were recorded in the pre-designed structural proforma. The age, sex, district, financial status, and therapy information were collected as per designed proforma.

A total of 114 blood samples were taken from the study population in order to identify HCV antibodies. Under aseptic circumstances, five millilitres of blood were drawn from each patient using a disposable syringe and allowed to clot. Samples were centrifuged for 5 minutes at 5000 rpm, and plasma was transferred to separate test tubes for further analysis. The first screening was done using immunochromatographic methods (ICT) to detect HCV antibodies in plasma or serum. Hepatitis C antibody detection with ICT: The test strip was removed from the foil wrapper and placed on a clean, dry surface. 2 drops of buffer were put to a 2.5l serum sample dispensed on the sample pad. After 15 minutes, the results were interpreted based on the presence of colour bands. A control was also run to ensure the kit's validity. Both the purplish-red test band and the purplish-red control band showed on the strip's membrane, indicating a positive result. In the control region, one purplish line emerges on the strip's membrane (C). The absence of a red line test region implies a negative outcome. All the collected data were entered and analyzed through a statistical package for social sciences version 22 (SPSS v.22). The descriptive statistics were applied to the collected data.

**RESULTS**

This study enrolled a total of 114 chronic kidney disease patients, with 60 men (52.63%) and 54 females (47.36%). The study included females and men of all ages, with females averaging 40-46 years old and males averaging 46-60 years old. Females were the most prevalent HCV-positive patients in this study, accounting for 32 (28.07

percent) and men for 27 (24.56 percent) (Table 1). Similarly, the total number of HCV cases diagnosed by ICT was 114 (99.9%), with 59 (51.75%) confirmed samples and 55 (48.24%) negative individuals. We were able to determine the total number of HCV-positive cases during this analytical study. On the other side, in this study, the sensitivity, specificity, PVP, and PVN were also determined among all patients, which are 83.05 percent, 72.72 percent, 76.56 percent, and 80.00 percent, respectively (Table 3, 4).

Table No. 1 Distribution of HCV among selected patients

Parameters	Number (Percentage)	Number (Percentage)
Genders	Males	Female
Disease	27 (24.56%)	32 (28.07%)
Non- Disease	33 (28.94%)	22 (19.29%)
Total Numbers	60 (52.63%)	54 (47.36%)

Table No. 2 Specificity and Sensitivity of HCV rapid testing patients

Results	Positive	Negative	Total
Disease	49	10	64
No Disease	15	40	50
Total	59	55	114

Specificity= 40/40+15 x100 =72.72%; Sensitivity= 49/49+10 x100 = 83.05%

Table 4 PVP and PVN among HCV patients

Results	Positive	Negative
Disease	49	10
No Disease	15	40

PVN = 40/10 +40 x 100 =80.00%; PVP = 49/49 + 15 x 100 =76.56%

**DISCUSSION**

In this investigation, the ICT screening technique exhibited a sensitivity and specificity of 83.05 percent and 72.72 percent, respectively, for screening HCV. The screening procedures limit false-negative and false-positive outcomes. A study from Lahore, Pakistan, discovered ICT sensitivity, which demonstrated a poor detection rate of positive cases in association with the ELISA<sup>3</sup>. When compared to our study, a study from Lahore found that sensitivity was low (44 percent to 66 percent), but specificity was extremely high (93 percent to 100 percent)<sup>13</sup>. When compared to ELISA, an investigation from Lahore found 2.35 percent false-positive cases on ICT<sup>2</sup>.

Another study from Pakistan found that 0.15 percent of ICT results in blood giver screening were false positive<sup>14</sup>. Both of these tests showed a low rate of false positives, and the results were consistent with our findings. The subjects in this research were 992 randomly chosen, self-selected, apparently healthy persons who comprised a really people as possible of Lahore in terms of gender, age, and financial level. As a cosmopolitan metropolis, this correlates to a cross-sectional example of a significant number of people from various classes, academic ability, and occupations who share a place and hence reflect the overall population<sup>14</sup>.

The prevalence of HBsAg and anti-HCV elevated from 0.00 % and 0.47 % in persons below 9 years old to 35.00 % and 34.58 % in groups 3 and 4, respectively<sup>15</sup>. In any event, no inferences can be drawn from this experiment on the frequency of vertical transmission<sup>16</sup>. The frequency of HBV and HCV contaminations is altering all across the world, according to the results of the great majority of tests<sup>17</sup>. The

prevalence and magnitude to which different risk variables have contributed to HBV or HCV transmission can explain some things of the difference between places<sup>18, 19</sup>.

Chronic HBV infection is uncommon (less than 1% in North America, Australia, and New Zealand), 5-18% in China, 2-4% in Japan, and most prevalent (15-20% in Taiwan)<sup>20</sup>. The frequency of persisting HCV infection is least in the United Kingdom and Scandinavia (0.01 percent 0.1 percent), whereas it is higher in Egypt (15-20 percent)<sup>19,21</sup>. Anti-HCV recurrence rates in Pakistan have been reported to be 13.5 percent and 17.77 percent, respectively<sup>22</sup>. Alam et al discovered HBV and HCV prevalence rates of 13.2% and 35.8%, respectively, among seemingly healthy Pakistanis and 38.0 percent and 16 percent, respectively, among clearly healthy Nigerians working in Saudi Arabia's Makkah region<sup>23</sup>. There have been a few research on the prevalence of hepatitis B and C in the general population of Pakistan, with detailed extremely capable varied statistics. Numerous in-depth examinations have showed that Pakistan is in the centre of the pack in terms of hepatitis B and C contaminations<sup>24, 25</sup>.

## CONCLUSION

Based on the findings of this study, we can conclude that the HCV test is still sensitive and specific for the detection of Hepatitis C virus on ICT in both men and women, and that it should be utilised in clinical settings. There was a considerable frequency of Hepatitis C in the Department of Nephrology at Khyber Teaching Hospital Peshawar, with a larger ratio of males than females, according to the findings. We are unable to apply the gold standard methodologies of HCV by ELISA and HCV by PCR at government hospitals due to financial and other challenges with data collecting and processing, so we examine HCV in both males and females and compare the results.

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