Prevalence of HCV Infection in End Stage Renal Disease (ESRD) Patients on Maintenance Hemodialysis

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ABSTRACT

Hepatitis C virus (HCV) is a significant cause of morbidity and mortality in haemodialysis patients. Patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-hemodialysis patients. Objective: To determine the frequency of HCV infection in End Stage Renal Disease (ESRD) patients on maintenance hemodialysis. Methods: The Descriptive Cross-sectional study was conducted at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. All patients above 18 years of age and below 60 years of age having end stage renal disease on maintenance hemodialysis were consecutively enrolled. Post hemodialysis patient’s serum was checked for anti HCV antibody by enzyme linked immune-sorbet assay (ELISA). Presence of anti HCV antibodies in serum detected by ELISA was labeled as HCV positive. Results: Of 90 patients, the mean age of the patients was 46.85 ±8.21 years. There were 54 (60%) males and 36 (40%) females. The mean duration of hemodialysis was 10.39 ±3.31 months. The frequency of HCV was found to be 21 (23.3%). A significant association of HCV was found with gender (p-value 0.006) whereas age (p-value 0.597) and duration of hemodialysis (p-value 0.715) was found to be insignificant. Conclusion: The frequency of HCV infection was found to be 23% in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome.

INTRODUCTION

According to the "National kidney foundation, chronic kidney disease is defined as decrease Glomerular filtration rate (GFR) for ≥3 months duration [1]. In stage 5 CKD also known as end stage renal disease (ESRD) the GFR is < 15 ml /min/ 1.73m² [2]. ESRD patients require renal replacement therapy like hemodialysis to sustain life. In the developed country like USA, the number of CKD patient on regular hemodialysis are 468,000 [3-6]. The occurrence of HCV infection in CKD - 5 is increasing as compare to general population as there is strong evidence of HCV transmission in dialysis patient [7]. HCV is transmitted through blood and its load is increasing worldwide [8-11]. Around the globe approximately 130-150 million people are infected with chronic hepatitis C. HCV infection affects liver leading to cirrhosis and hepatocellular carcinoma as well as kidneys causing albuminuria, cryoglobulinemia and membranoproliferative glomerulonephritis[12]. According to center of disease control(CDC%), the prevalence of HCV in ESRD is 8.5% [13]. In middle-east countries the prevalence of HCV in hemodialysis population 25.3% [14]. Important viral factors responsible for pathogenesis of chronic hepatitis are viral diversity and replicative activity along with host factors such as immunodeficient states [15]. Increase morbidity in HCV infection in ESRD on
maintenance hemodialysis patients is due to increase in inflammatory markers and alterations in nutritional status. HCV is also associated with increase cardiovascular mortality[16]. Many risk factors like alcohol abuse, tobacco consumption, older age of HCV acquisition, duration of infection as well as co-infection with Human immunodeficiency virus or other hepatotropic viruses are associated with more rapid progression of liver disease in hemodialysis patients. HCV is a significant cause of morbidity and mortality in haemodialysis patients. Patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-hemodialysis patients. Early detection and regression of HCV can cause reduction of mortality in haemodialysis patients. Hence, the study was aimed to determine the frequency of HCV infection in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome.

**M E T H O D S**

The Descriptive Cross-sectional study was conducted up on 90 patients with ESRD (having GFR <15ml/min/1.73m²) who were on maintenance hemodialysis, at Department of Nephrology, Liaquat University of Medical and Health Sciences Jamshoro. All patients above 18 years of age and below 60 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. Patients with hepatic dysfunction, alcohol abuse, decompensated liver cirrhosis, multi organ dysfunction specifically AKI and patients with history of blood transfusions, surgery including dental procedures, tattooing, drug abuse, jaundice, hemophilia and thrombocytopenia were excluded from the study. Post hemodialysis patient’s serum was checked for anti HCV antibody by enzyme linked immune-sorbent assey (ELISA). Presence of anti HCV antibodies in serum detected by ELISA was labeled as HCV positive. Descriptive statistics was analyzed by SPSS version 21.0. The quantitative variables such as age, duration of hemodialysis was recorded as mean ± S.D. and qualitative variables like gender and HCV status of patients. Effect modifiers age, gender and duration of hemodialysis was controlled through stratification, post stratification chi-square test was applied, keeping P-value <0.05 as significant".

**R E S U L T S**

The mean age of the patients was found to be 46.85 ±8.21 years, with 54 (60%) males and 36 (40) females (figure 1). There were 30 (33.3%) patients with ≤45 years and 60 (66.7%) patients with >45 years of age.

<table>
<thead>
<tr>
<th>Variable</th>
<th>HCV Yes</th>
<th>HCV No</th>
<th>Total</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duration of illness</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤10 years</td>
<td>6 (20%)</td>
<td>24 (80%)</td>
<td>30 (100%)</td>
<td>0.597</td>
</tr>
<tr>
<td>&gt;10 years</td>
<td>15 (25%)</td>
<td>45 (75%)</td>
<td>60 (100%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21 (23.3%)</td>
<td>69 (76.7%)</td>
<td>90 (100%)</td>
<td></td>
</tr>
<tr>
<td>Gender of patients</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>18 (33.3%)</td>
<td>36 (66.7%)</td>
<td>54 (100%)</td>
<td>0.006</td>
</tr>
<tr>
<td>Female</td>
<td>3 (8.3%)</td>
<td>33 (91.7%)</td>
<td>36 (100%)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>21 (23.3%)</td>
<td>69 (76.7%)</td>
<td>90 (100%)</td>
<td></td>
</tr>
<tr>
<td>Duration of hemodialysis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>≤10 months</td>
<td>11 (25%)</td>
<td>33 (75%)</td>
<td>44 (100%)</td>
<td>0.715</td>
</tr>
<tr>
<td>&gt;10 months</td>
<td>10 (21.7%)</td>
<td>36 (78.3%)</td>
<td>46 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

**T a b l e 1:** Comparison of HCV among patients (n=90)

**D I S C U S S I O N**

This study was conducted in a large public sector hospital to assess the hepatitis C virus infection in patients with ESRD. For this purpose, patients above 18 years of age and below 60 years of age of both gender having end stage renal disease on maintenance hemodialysis with 3 months or more of maintenance hemodialysis were consecutively enrolled. ESRD patients require renal replacement therapy like hemodialysis to sustain life. In the developed country like USA, the number of CKD patient on regular hemodialysis are 468,000 [17]. The occurrence of HCV infection in CKD -5 is increasing as compare to general population as there is strong evidence of HCV transmission in dialysis patient. Around the globe approximately 130-150 million people are infected with chronic hepatitis C. HCV infection affects liver leading to cirrhosis and hepatocellular carcinoma as well as kidneys causing albuminuria, cryoglobulinemia and...
membranoproliferative glomerulonephritis.” In the current study, the frequency of HCV was found to be 23.3%. This finding found similar with a study conducted in middle-east countries in which the prevalence of HCV in hemodialysis population was found to be 25.3%. However, in a study by centre of diseases control (CDC), the prevalence of HCV in ESRD was reported to be 8.5% [18]. Important viral factors responsible for pathogenesis of chronic hepatitis are viral diversity and replicative activity along with host factors such as immunodeficient states. Increase morbidity in HCV infection in ESRD on maintenance hemodialysis patients is due to increase in inflammatory markers and alterations in nutritional status [19]. HCV is also associated with increase cardiovascular mortality. Many risk factors like alcohol abuse, tobacco consumption, older age of HCV acquisition, duration of infection as well as co-infection with Human immunodeficiency virus or other hepatotropic viruses are associated with more rapid progression of liver disease in hemodialysis patients. In the current study, we failed to collect data on alcohol abuse, tobacco consumption and duration of infection as well as co-infection with Human immunodeficiency virus or other hepatotropic viruses which were accounted by many other researchers [20, 21]. In this study, however, HCV was found significantly associated with gender while age and duration of hemodialysis was found to be insignificant while Ladino M et al. found a significant association between female gender and comorbid infection of HCV [4]. It is reported that HCV is a significant cause of morbidity and mortality in haemodialysis patients. Current study postulates that the patients on haemodialysis are at high risk for HCV, with frequency of infection several times higher than that in non-haemodialysis patients, which is in line with the studies conducted by Pujol H., Crook ED., and Fabrizi F [12, 14, 15]. The findings of the study could be highlighted in the light of limitation that this study was a descriptive study. Furthermore, certain important variables were not included. Future multi-centre studies are recommended to preclude the findings of this study.

CONCLUSIONS

The frequency of HCV infection was found to be 23% in ESRD patients on maintenance hemodialysis. Early recognition and treatment of which improves the patient outcome.

Conflicts of Interest

The authors declare no conflict of interest

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