SHORT REPORT

Sero-prevalence of Hepatitis C virus infection in patients undergoing haemodialysis in Al-Najaf Province

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Abstract

This study identified the predominance of HCV in patients undergoing haemodialysis and the risk factors related to age, gender, residence and occupation. It was conducted in the haemodialysis centre in Al-Saddar hospital in Al-Najaf province. A total of 193 patients were enrolled. Blood was drawn for testing HCV antibodies using ELISA. A positive result for presence of antibodies confirmed HCV infection.

Of 193 patients studied, 43(22.3%) were infected with HCV. The higher frequency of infection was in the age group 31-50 years (11.4%). The rate of HCV in women was (22.89%), while in men it was (21.81%) which was an insignificant difference. According to residence and occupation, no significant differences between prevalence in urban and rural areas was observed. Housewives were the vulnerable group that got infected.

In patients undergoing haemodialysis, HCV infection was extremely high with no obvious differences of HCV between gender, age, residence and occupation.

Keywords: Haemodialysis, Hepatitis C, Antibodies, Hepaciviral, Renal Dialysis

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Introduction

One of the most frequently reported viral illness in both industrialized and developing nations is the hepatitis C virus. It is a blood borne and an enveloped virus, which measures 50 nm in dimensions. It has an icosahedra nucleocapsid, which is bordered by a phospholipid bilayer membrane and contains two glycol-proteins known as (E1) envelope one and (E2) envelope two proteins, and an RNA positive strand with a length of around 9.6 kb.[1] Commonly, the frequent routes for spread of HCV infection are through transfer of small amounts of contaminated blood between people. This occurs via unsafe injection practices, unsafe health care, and transfusion of unscreened blood. Despite the fact that HCV infection is an acute or short-term illness, more than 50% of those infected go on to acquire a chronic infection or long-term illness, which can lead to serious, even fatal health sequelae like cirrhosis and liver cancer.[2] Epidemiology reveals the figures of 399000 people who died in 2015 because of HCV infection, mostly from its complications as liver cirrhosis and hepatocellular cancer. In 2017, World Health Organization declared that 71 million individuals suffered from a chronic state of HCV infection worldwide.[3] Patients with renal failure undergoing maintenance haemodialysis are at a high risk of exposure to microbial infections. They have an underlying impaired cellular immunity response, which is a risk factor for acquiring infections. In addition, the procedure of HD involves blood contact to infective materials by means of vascular access and extracorporeal circuit for a prolonged time. Besides, the proximity of the patients during dialysis, contact with the medical stuff, change of the dialysis centre and the need for frequent hospitalization and surgical intervention may increase the opportunities to nosocomial infection exposure. The most frequent viral infections resulting in complications of HD treatment is (HCV).[4] Risk factors for HCV infection include reduced resistance, invasive medical procedures, numerous blood transfusions, and shared exposure to infected persons among haemodialysis users.[5] However, patients should be screened for HCV infection when they start receiving renal dialysis or when they change from one dialysis clinic to another.[6]

Epidemiology studies have shown that HCV infection is higher among HD patients than in the general population.[7] According to a recent study, the prevalence of HCV in patients with HD ranges from 1.4 to 28.3% in industrialized nations and 4.7 to 41.9% in poor countries.[8] Additionally, there are significant regional differences in the spread of HCV in haemodialysis facilities. In Iraq, a study done on 169 patients with End Stage Renal Failure undergoing haemodialysis, showed the prevalence rate of HCV to be 7.1%.[9] in comparison to 1.42% in the general population as reported by the ministry of health in 2009.[10]

In Najaf province, prevalence of HCV infection and its associated risk factors with relation to age, gender and

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residence among HD patients has not been well documented. Therefore, this prospective study was conducted to assess the prevalence rate of HCV in a dialysis centre.

Patients/Methods and Results

A cross-sectional study was conducted at a dialysis facility in the Al-Saddar medical city in the governorate of Al-Najaf, Iraq during the period from first of December to third of April in (2021) Included were 193 patients with ages from 13 to 81 years, of whom 110 were men and 83 women. Patients attending the dialysis centre came from various parts of the province of Al-Najaf. After obtaining informed consent for participating in the study, data was collected by using a structured questionnaire filled during interviews. A blood sample was collected from all patients who agreed to participate in this study. Age, gender, area of residence, blood group, date of examination and the result of the laboratory tests including HCV-IgG-Abs were noted.

Serum was separated from the blood after centrifuging for ten minutes at 1500 rpm. The sera were then stored at -20˚C for further serological investigation. Serological tests were performed in the Al-Najaf health centre's public health lab. HCV-Abs (IgG) was detected using an ELISA kit of the third generation, (AB Diagnostic Systems GmbH, Germany). This test makes use of the diagnostic kit's indirect qualitative factors. SPSS statistical application version 24SPSS was used for analysis. In descriptive statistics, frequencies and relative frequencies were used. The Chi-Square statistical test was applied to look at statistical relationships between the variables. The results were considered statistically significant when the P-value was less than 0.05.

Of the 193 patients enrolled, 110(57%) were males and 83(43%) were females.

The ages ranged from 13 to 81 years, (mean age 44.05 with SD 17.1). The details of their residence and occupation are shown in the Table. The prevalence rate of HCV infection in patients on haemodialysis is shown in (Figure 1). It was recorded as positive in 43 (22.3%) and 150 (77.7%) were negative. Figure (2) illustrates how the frequency of HCV infection varied by age group with higher frequency (22/193) (11.4%) in the age range 30-50 years. This was followed by the age group >50 years (5.7%, 11/193), and the age group 10-30 years (5.2%, 10/193). The prevalence rate of HCV infection was (22.89%, 19/83) in females, and (21.81%, 24/110) in males. Statistical evaluation proved it to be insignificant p=0.05 with a probability of 0.304872. This result revealed no sex preponderance. Our data showed that, the prevalence rate of HCV infection in patients living in the urban areas was (22.03%, 26/118) and in the rural areas was (22.6%, 17/75) with no significant differences between the two groups. (p<0.05) Regarding the occupation, the most vulnerable groups infected with HCV were Housewives (18/43) (41.86%), followed by Gamers (14/43) (32.55%).

Table: General characteristics of patients

Characteristics		Value
Age (years)	Range	13-81 years
	Mean	44.05± 17.1years
Gender n (%)	Male	110 (57)
	Female	83 (43)
Residence n (%)	Urban	118 (61.14)
	Rural	75 (38.86)
Occupation n (%)	Student	12 (6.2)
	Employee	20 (10.4)
	Retired	7 (3.6)
	Gainer	70 (36.3)
	Housewife	71 (36.8)
	Unemployed	13 (6.7)

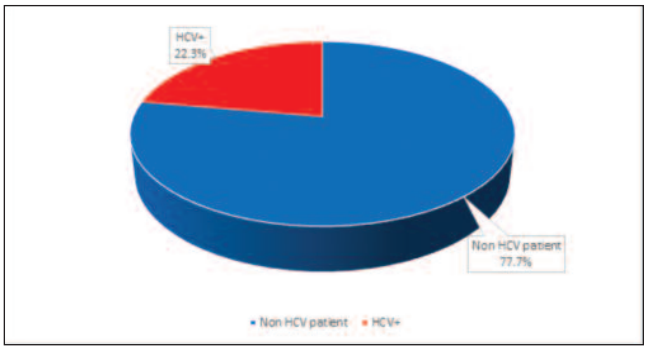

Figure-1: Prevalence rate of HCV in HD

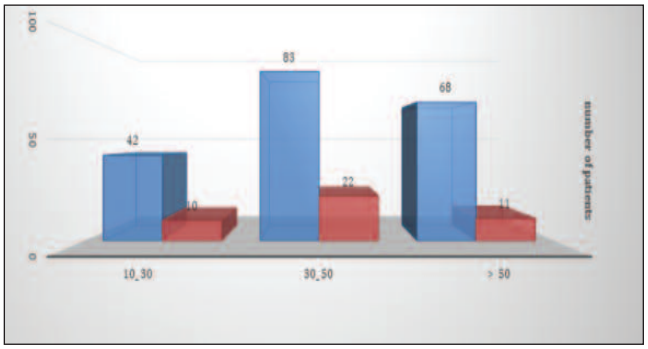

Figure-2: Prevalence of HCV according to age distribution

Conclusion

When compared to prevalence rates in the local community and abroad, individuals receiving haemodialysis had a comparatively high prevalence rate of HCV infection. HCV infection may spread due to many causes, including blood transfusions, an increase in the

quantity of units given to HD patients, and the length of HD treatment.

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