

# Hepatitis C Virus Infection among Patients in Hemodialysis Unit at Baghdad Teaching Hospital

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## ABSTRACT

**Background:** Viral hepatitis C infection is an important cause of morbidity and mortality in hemodialysis patients, and its prevalence varies considerably among different areas of the world. Patients receiving maintenance hemodialysis are at high risk for acquiring hepatitis C virus infection than the general population.

**Objectives:** To estimate the frequency rate and the possible associated factors responsible for hepatitis C viral infection among chronic hemodialysis patients.

**Methods:** A cross-sectional study was carried out at hemodialysis unit in Baghdad Teaching Hospital for the period from 1<sup>st</sup> February to 30<sup>th</sup> April 2018. The total study group consisted of 218 patients. The participants were directly interviewed according to questionnaire consist socio-demographic data were (age, gender, marital stats, occupation) and duration on hemodialysis, number of hemodialysis session, history of blood transfusion and previous surgery also viral screen of all patients for HCV infection.

**Results:** The frequency rate of hepatitis C infection was 26%. Male, age between 51-70 years, married and unemployed were having higher rates of infection. Hemodialysis patients with diabetes mellitus and dental procedures were more prone to hepatitis C infection while blood transfusion was not a significant factor.

**Conclusion:** High rate of hepatitis C virus in hemodialysis patients in Baghdad teaching Hospital. The hepatitis C virus infection was significantly associated with duration of dialysis, diabetes mellitus and dental procedures.

**Keywords:** Hepatitis C virus infection, Hemodialysis, Nosocomial transmissions.

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Hepatitis C virus (HCV) is a contagious disease that ranges in severity from mild illness lasting a few weeks to serious, lifelong illness that attacks the liver. It results from infection with the HCV, which is spread primarily through contact with the blood of an infected person<sup>(1)</sup>. In developing countries chronic hepatitis C is the most prominent cause for liver cirrhosis, hepatocellular carcinoma and liver transplantation<sup>(2)</sup>. The nosocomial transmissions due to poor infection-control measures among hemodialysis (HD) patients is the most important ones<sup>(3)</sup>.

The prevalence of HCV infection in patients undergoing dialysis is greater than that in general population, suggesting that patients on dialysis may be at higher risk of acquiring HCV infection, this is predominantly because these patients are more exposed to risk factors for the acquisition of this infection<sup>(4)</sup>.

Worldwide the HCV prevalence ranges from 0.4% in Germany to 22% in Egypt<sup>(5)</sup>. HCV prevalence among HD patients varies from 4% to 70<sup>(6)</sup>. The reported prevalence in the general population in Iraq 0.8<sup>(7)</sup> among health care workers in Baghdad was recorded in males 2.13%, female 0.99%<sup>(8)</sup>, and in blood donors 0.3%<sup>(9)</sup>. The prevalence of hepatitis C among HD patients was 7.1% in Baghdad in 2008<sup>(10)</sup> in Sulaimani 26.7% in 2010<sup>(11)</sup>. In the three southern provinces; Basra, Missan and

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Thiqar, in 2012, the prevalence was 4.1%<sup>(12)</sup> and 6.6% in Karbala in 2015<sup>(13)</sup>.

## Methods

A cross-sectional case series study was carried out on 218 patients who were admitted in HD unit in Baghdad Teaching Hospital, Medical City Complex, complaining from end-stage renal disease on regular HD, at any age and sex were included in the study, collection of data was from 1<sup>st</sup> February to 30<sup>th</sup> April 2018.

A questionnaire was designed for the purpose of study involving information about age, sex, marital status, occupation, duration of hemodialysis, number of hemodialysis session. The questionnaire also included a history of patients risk factors such as; HT, DM, blood transfusion and history of tattoo.

Statistical analysis to the data was approved by using the available statistical package of SPSS-24. Data arranged and tabulated in number and percentage, using chi-square test and fissure test. A p value of less than 0.05 was consider statistically significant.

## Results

Among the total study group, 218 patients the prevalence of HCV infection was 56 (26%). The mean age of participants was (60.5±19) with minimum age of 19 years and the maximum age was 86 years.

Two third of participants were males 66.5%; married 73.9%; and not worker 35.3%. The duration of dialysis among the study group ranged from 1 month to 96 months (8 years). Around 50.5% of participants received blood transfusion. There were 15 (6.9%) renal transplant patients in this study. Out of these patients 13 (6%) of them were HBV infection. These findings and observation are summarized in tables 1A and 1B.

Tables 2A and 2B demonstrate the main associated factors which have statistical significant with HCV infection were HD duration number of HD sessions/week, HD in other centers, history of diabetes mellitus, dental intervention and HBV infection. While other factors including socio-demographic, blood transfusion, renal transplantation, surgical intervention, hypertension, alcohol intake and tattoo, not associated.

High frequency rate of HCV infection among male, age between 51-70 years, married and unemployed.

**Table 1A: Distribution of study sample socio-demographic characteristics n=218**

Variable	No.	%	
Gender	Male	<b>145</b>	<b>66.5</b>
	Female	73	33.5
Age(years)	<30	26	11.9
	30-50	69	31.7
	51-70	<b>107</b>	<b>49.1</b>
	>70	16	7.3
Marital status	Single	28	12.8
	Married	<b>161</b>	<b>73.9</b>
	Divorced	3	1.4
	Widowed	26	11.9
Occupation	Governmental	32	14.7
	Free work	70	32.1
	No work	<b>77</b>	<b>35.3</b>
	Retired	39	17.9

**Table 1B: Distribution of the study sample clinical and other variable n=218.**

Variable		No.	%
Duration of hemodialysis (months)	<12	<b>96</b>	<b>44</b>
	12-24	69	31.7
	25-36	28	12.8
	>36	25	11.5
Number of HD / week	Once	9	4.1
	Twice	167	76.6
	Thrice	42	19.3
Period between HD and HCV diagnosis(month) n=56	<12	8	14.2
	12-24	<b>34</b>	<b>60.7</b>
	>24	14	25.1
Blood transfusion	Yes	<b>110</b>	<b>50.5</b>
	No	108	49.5
Number of transfusion	Once	57	51.8
	>Once	53	48.2
HD in other centers	Yes	36	16.5
	No	182	83.5
Renal transplantation	Yes	15	6.9
	No	203	93.1
Surgical intervention	Yes	45	20.6
	No	173	79.4
Dental intervention	Yes	44	20.2
	No	174	79.8
Diabetes mellitus	Yes	53	24.3
	No	165	75.7
Hypertension	Yes	<b>130</b>	<b>59.6</b>
	No	88	40.4
Alcohol intake	Yes	4	1.8
	No	214	98.2
Tattoo	Yes	5	2.3
	No	213	97.7
HCV	Yes	<b>56</b>	<b>25.7</b>
	No	162	74.3
HBV	Yes	<b>13</b>	<b>6</b>
	No	205	94

**Table 2A: Association between demographic factors in patients with ESRD and HCV infection.**

Variable	HCV (n 56)		Negative		P value	
	No.	%	No.	%		
Gender	Male	<b>39</b>	<b>26.9</b>	106	73.1	0.565
	female	17	23.3	56	76.7	
Age	<30	7	26.6	19	73.1	0.915
	30-50	16	23.2	53	76.8	
	51-70	<b>28</b>	<b>26.2</b>	79	73.8	
	>70	5	31.3	11	68.8	
Marital status	Single	8	28.6	20	71.4	0.851
	Married	<b>42</b>	<b>26.1</b>	119	73.9	
	Divorced	1	33.3	2	66.7	
	Widowed	5	19.2	21	80.8	
Occupation	Governmental	9	28.1	23	71.9	0.788
	Free work	17	24.3	53	75.7	
	No work	<b>22</b>	<b>28.6</b>	55	71.4	
	Retired	8	20.5	31	79.5	

**Table 2B: Association between clinical and other variable factors in patient with ESRD and HCV infection.**

Variable	HCV (n 56)		Negative		P value	
	No.	%	No.	%		
Duration of hemodialysis (months)	<12	5	5.2	91	94.8	<b>&lt;0.001</b>
	12-24	19	27.2	50	72.5	
	25-36	12	42.9	16	57.1	
	>36	20	80	5	20	
Number of HD / week	Once	0	0	9	100	<b>0.001</b>
	Twice	36	21.6	131	78.4	
	Thrice	20	47.6	22	52.4	
Blood transfusion	Yes	23	20.9	87	79.1	0.087
	No	33	30.5	75	69.5	
Number of transfusion	Once	12	21	45	79	0.278
	>Once	11	20.7	42	79.3	
HD in other centers	Yes	16	44.4	20	55.6	<b>0.005</b>
	No	40	22	142	78	
Renal transplantation	Yes	6	40	9	60	0.189
	No	50	24.6	153	75.4	
Surgical intervention	Yes	9	20	36	80	0.213
	No	47	27.2	126	72.8	
Dental intervention	Yes	20	45.5	24	54.5	<b>0.001</b>
	No	36	20.7	138	79.3	
Diabetes mellitus	Yes	21	39.6	32	60.4	<b>0.008</b>
	No	35	21.2	130	78.8	
Hypertension	Yes	33	25.4	97	74.6	0.901
	No	23	26.1	65	73.6	
Alcohol intake	Yes	2	50	2	50	0.261
	No	54	25.2	160	74.8	
Tattoo	Yes	3	60	2	40	0.076
	No	53	24.9	160	75.1	
HBV infection	Yes	8	61.5	5	38.5	<b>0.002</b>
	No	48	23.4	157	76.6	
Blood urea	<100	17	29.8	40	70.2	0.706
	100-200	36	24.2	113	75.8	
	>200	3	25	9	75	
S. Creatinine	2.7 - 6.7	21	22.8	71	77.2	<b>0.024</b>
	6.8 - 10.7	25	24.5	77	75.5	
	10.8 - 14.7	10	52.6	9	47.4	
	>14.7	0	0	5	100	
Hb	5 - <7	9	23.1	30	76.9	0.492
	7- <9	27	24.5	83	75.5	
	9 - 10	14	35	26	65	
	>10	6	20.7	23	79.3	

## Discussion

This study revealed that the frequency rate of HCV among HD patients was 26%. This rate is much higher than the rate reported by a previous study done in Baghdad by Khattab, et al (2008) in Iraqi renal transplant center, which reported prevalence of 7.1%<sup>(10)</sup>. This high rate may be due to nosocomial transmission of hepatitis C among HD patients<sup>(14,15)</sup>. Similar finding were reported in Algeria by National office of statistics (2008) was 23.8%<sup>(16)</sup>.

The hepatitis C virus infection was significantly associated with duration of dialysis ( $P < 0.001$ ) it is agreement with many studies in Iran by Hamissi, et al (2011)<sup>(6)</sup>. This may be related to the increase of period of exposure to the virus, the more the patients stay in contact with hemodialysis machines the more the risk to HCV infection increase<sup>(17)</sup>.

A positive significant relationship was found in this study between attending multicenter and single center dialysis ( $p=0.005$ ), this agrees with studies conducted in Khuzestan province, Southwest Iran, by Assarehzadegan, et al (2009)<sup>(18)</sup>. This might be related to different degree of sanitation and disinfection of HD machines instruments and environmental surface to prevent nosocomial transmission<sup>(19)</sup>.

In this study, blood transfusion was not statistically associated with HCV infection. Similarly, surgical procedures were not associated with HCV infection because of strict adherence to sterile technique, while dental procedure was found to be associated factor of hepatitis C transmission. This finding agree with another study by Mohboobi, et al (2013)<sup>(20)</sup> and study in Jordan by Imad, et al (2015)<sup>(21)</sup>.

High frequency rate of HCV infection was observed in patients with DM. This have been concur by other study done in Bangladesh by Dipta, et al (2009)<sup>(22)</sup> and in Saudi Arabia HD centers, by Mohamed, et al (2010)<sup>(23)</sup> which concluded that diabetes mellitus may play a role in increasing the

frequency rate of HCV infection in HD patients. This may be explained by immunity decrease in hyperglycemic patients<sup>(22,23)</sup>.

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