Prevalence and Risk Factors for Hepatitis C Virus Infection in Hemodialysis Pateints in Sulaimani

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ABSTRACT

Background and Objectives: Haemodialysis patients have an increased risk of exposure to hepatitis C virus (HCV) infection. A high prevalence of HCV infection in hemodialysis (HD) patients has been reported. The study was carried out to determine the prevalence of HCV infection among HD patients and its association with certain socio-demographic variables and risk factors in Sulaimani governorate.

Material and Methods: A total of 101 patients on hemodialysis in sulaimani dialysis unit were studied from 1st October to 31st of December 2009. All study subjects were screened for anti- HCV antibody by third generation ELISA and confirmed by RIBA 111. Soci-demographic data and Factors that might be implicated in HCV transmission were collected.

Results: The overall prevalence of HCV was 26.7%. A significant association of anti- HCV with dialysis duration, history of blood transfusion, number of transfused blood units was found.

Conclusions: HCV is common among Sulaimani hemodialysis patients, and significantly associated with length of dialysis and number of transfused blood units. The use of separate machines for those who are anti-HCV positive should be emphasized.

Key words: Hepatitis C, Sulaimani, hemodialysis, prevalence.

INTRODUCTION:

Hemodialysis (HD) patients have an increased risk of exposure to hepatitis C virus (HCV) infection. There is a particular concern because of the high risk for chronic liver disease, complications in renal transplantation, and death in these patients.[1] The prevalence of HCV infection among HD patients varies from country to country and from center to another, ranging between 2.9% and 68%, it is higher in developing countries [2-10] compared to the Western countries.[11-14] In Iraq several studies have defined the prevalence of anti -HCV among blood donors, general population, and certain risk groups including HD patients and dialysis staff. [15-25] No published data are available on the prevalence of anti-HCV among HD patients in Sulaimani governorate. However, few studies are available on the of this infection among blood donors,[26-28] and thalassemic children. [29] This study was carried out, therefore, to determine the prevalence of HCV infection among HD patients and its association with certain socio-demographic variables and risk factors in Sulaimani governorate.

MATERIAL AND METHODS:

This study was carried out at Sulaimani dialysis center, Chwarbakh hospital, Sulaimani city. A total of 101 patients on hemodialysis (HD) for at least three months were included in the study. The study extended from 1st of October to 31st of December, 2009. A verbal consent was obtained from each participant and especially designed questionnaire was filled out for each subject by direct interview. The data requested included

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socio-demographic characteristics (age, gender, marital status, residence, educational level, occupation, number of household members and number of rooms), and possible risk factors for HCV infection such as history of blood transfusion, frequent drug injections and surgical and/or dental procedures, and duration of HD. Household crowding index was calculated by dividing number of household members by number of rooms. Occupations were classified into professionals (doctors, dentists, pharmacists, veterinarins, engineers, lawyers, faculty members, managers and company directors, large business directors), non-manual skilled and semiskilled occupations (health care workers other than doctors, dentists, pharmacists and veterinaries; teachers; clerical workers; military and policemen and small business owners), partly skilled or unskilled occupations (barbars, drivers, farmers, retired, unemploymed, labor workers and cleaners), students and housewives. Five ml. of venous blood was obtained from each participant by veni-puncture; the serum was separated and stored at -20 C in deep freeze until laboratory testing. The collected sera were examined for presence of anti-HCV antibody by using a third generation enzyme immuno-sorbent assay (ELISA) and a third generation recombinant immuno-blot assay (RIBA111) for confirmation of the presence of anti-HCV antibodies, using the commercially available kits. Serum testing was carried out at the central laboratories of DOH of Sulaimani governorate. The statistical Package for Social Sciences (SPSS, version 17) was used for date entry and analysis. Chi-square, fisher's exact test, t-test and multiple logistic regression were used for statistical analysis. P-value of ≤ 0.05 was regarded as statistically significant.

RESULT:

The age range of HD patients was 17-85 male to female ratio of 1.7:1.The overall prevalence of anti-HCV was 26.7% (27 out of 101). The prevalence was 15.4% in males and 28.9% in females. The highest prevalence of infection was among patients in their 7th decade (37%), followed by those in the 4th decade (35.3%). No significant association between anti-HCV positivity and various socio-demographic variables was detected. These findings are shown in (Table 1). Table (2) shows that anti-HCV rate was significantly higher among HD patients with history of frequent drug injections ($p<0.001$) and blood transfusion ($p=0.037$). No significant association with other risk factors was demonstrated. A statistically significant difference between the means of time on dialysis and number of transfused blood units among anti-HCV positive patients and anti-HCV negative HD patients was found ($p<0.001$), as it is shown in (Table 3). Multivariate logistic regression revealed that only the time on dialysis (in months) and number of transfused blood units were significantly associated with HCV infection ($p<0.001$) (Table 4).

Table 1: Prevalence of anti-HCV by socio-demographic characteristics of participants.

Anti-HCV positivity				
Socio-dempgraphic variable	**Number tested**	**No.**	**%**	**P-value**
Gender				
Male	63	16	15.4	NS
Female	38	11	28.9	
Age				
<30	10	1	10.0	NA
30-39	17	6	35.3	
40-49	19	2	10.5	
50-59	28	8	28.6	
≥60	27	10	37.0	
Residence				
Urban	51	11	21.6	NS
Rural	50	16	32.0	
Marital status				
Married& Widowed	87	23	26.4	NS
Single	14	4	28.6	
Education				
Illiterate &unschooled	53	13	26.8	NA
1 - 6	22	5	22.7	
7 - 1	21	6	28.6	
>12	5	3	60.0	
Occupation				
Housewife & students	34	10	29.8	NS
Non-manual skilled & semiskilled	30	8	26.7	
Partly skilled & unskilled	33	9	27.3	
Crowding Index				
≤3	31	8	25.8	NS
>3	70	19	27.1	
Total	**101**	**27**	**26.7**	

Table 2: Prevalence of anti-HCV among HD patients in relation to risk factors

		Anti-HCV positivity		
Risj factor	**Number with the risk factor**	**No.**	**%**	**P-value**
History of jaundice	9	4	44.4	.243
Family history of jaundice	5	0	0.00	.321
History of surgical &/ or dental	83	23	27.7	.774
Procedures				
Frequent drug injections	29	16	55.2	<0.001
History of blood transfusion	91	27	29.7	.037
Imprisonment	7	1	14.3	.671
Ear piercing	33	9	27.3	1.000
Tattooing	9	2	22.2	1.000
Sharing personal utensils (razor, Toothbrush & nail-pickers)	10	0	0.00	0.058

Table 3: Comparison of the mean of time on dialysis and number of transfused blood units, between positive and negative HCV patients.

Mean ± S.D			
Variable	positives anti-HCV patients	Negative anti-HCV patients	P-value
Time on dialysis (in months)	28.44 ± 15.23	12.3 ± 9.31	< 0.001
No. of transfused blood units	16.40 ± 18.03	5.60 ± 6.76	< 0.001

Table 4: Multivariate logistic regression of certain socio-demographic characteristics& risk factors with prevalence of anti-HCV.

	β	**S.E**	**Wald**	**Df**	**P-value**	**O.R**	**95% C.I**
Time on HD (in months)	.108	.031	12.4	1	<0.001	1.115	1.049-1.184
Number of transfused	.070	.032	4.9	1	0.027	1.073	1.008-1.142
blood units							
Age	.010	.023	.19	1	0.656	1.010	0.966-1.057
Gender	-.821	.623	1.74	1	0.187	0.440	0.130-1.490
Constant	-2.977	1.529	3.791	1	0.052	0.051	

DISCUSSION:

This study revealed a high prevalence of anti-HCV among HD patients (26.7%). It is higher than rates that previously reported in Baghdad (7.1)% [25] and Al-Anbar governorate (11.7 %).[20] However, much higher prevalence was reported by Jabiar in Baghdad in [30].This finding, however, is similar to that reported in other developing countries, (26%) in Hungary, [10] (24%) in Iran, [31] (30%) in India, (24%) UAE and (26%) in Oman, [32] but, lower than that reported in Syria (48.9%),[4] Qatar (44.6%), [33] in Saudi Arabia (68%),[2] Peru and (59%). [34]This prevalence is very high when compared to reports from western countries, UK (0.4%),[11] Germany(6%),[12] Belgian(6.8%),[11] USA(8.4%),[13] Mexico (1.2%)[10]. These variations in the prevalence of anti-HCV among HD patients could reflect the variable prevalence of HCV infection in different countries and at different centers, as well as the way of identification of cases using different serological tests and variation in transfusion practices of the blood units. Universal infection control precautions are not applied in the same way at different centers. Other regional and environmental factors might play a role in the transmission.[2] No significant association between anti-HCV positivity and various socio-demographic characteristics such as age , gender, marital status, household crowding index, occupation, education… etc, was demonstrated. Other studies have revealed no significant association with gender,[23, 35, 36] although others have reported increased prevalence of anti-HCV in male HD patients.[2, 37] Some studies identified the duration of HD therapy as an important risk factor for HCV infection,[30,38] this finding is consistent with our results, which corroborate the idea that the long-term dialysis treatment involving hospital procedures may contribute to infection dissemination.[35] In term of the dialysis, the contamination risk might be related to the procedure itself, through horizontal accident of the dialysis with bleeding and contact with contaminated material.[37] Several studies reported a significant association between anti-HCV positivity and history of blood transfusion in HD patients, [2,14, 20, 25,29, 39] while other studies found none. [33,40] Our finding is in agreement with the first group. This study revealed a significant association with number of the transfused blood units. Other studies found similar findings.[14, 30, 39] History of surgical and / or dental interventions as a risk factor for HCV dissemination has been reported in many centers, [2, 3,41,42] which is inconsistent with the finding of our study. However, our findings agree with that reported by other workers. [43] A limitation of this study was that we did not test our patients for the presence of HCV RNA in their blood samples including anti-HCV negative patients. Relying on serological test alone, especially in patients, could underestimate the prevalence of HCV infected patients, as other workers have detected HCV RNA in 5% and 24% of their anti-HCV negative patients.[44,45] In conclusion this study revealed that duration of HD and number of transfused blood units as the main risk factors for HCV dissemination among HD patients. The introduction of more accurate ways of detection of HCV infection cases, better screening of blood donors for HCV antibodies and the use of recombinant erythropoietin in treating anemic patients, together with strict adherence to the universal infection control precautions are needed to decrease the prevalence of HCV infection among HD patients.

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