

Seropositivity of human immunodeficiency virus and hepatitis c virus among hemodialysis patients

Abstract

Background: Hemodialysis patients are exposing to many harms as blood borne viruses. This study was sought to determine the frequency of anti-HIV1/2, and anti-HCV seropositivity among hemodialysis patients attending Kosti Renal Dialysis Center.

Materials and methods: A total of 100 blood samples (68 men ,and 32 women) were included in this study that was carried out in Kosti Renal Dialysis center, during the period from 15 August to 20 November 2017. Each sample was tested for anti-HCV , and anti-HIV1/2 by immunochromatographic tests (Humasis) according to manufacture instructions.

Results: The frequency of anti-HCV, and anti-HIV1/2 were 5% (5/100), and 0% (0/100) respectively. There is non significant difference in the frequency of anti-HCV between men (4.4%) and women 6.3% or among the duration of hemodialysis.

Conclusions: Hemodialysis can expose patients to harms, and infections. Emergence of Blood borne pathogenic infections among hemodialysis patients has become a major public health threat worldwide. Continuous surveillance and implementation of control program can aid in the elimination and eradication of these problems.

Key words: CKD, ICT, Hemodialysis, HCV, HIV, Sudan

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Babiker Saad Almgadam,¹ Rayan Nader Ali,¹ Tasneem Rhamt Allah,¹ Elnaim Bushra Ahmed,^{1,2} Osama Abdelwahid Abdelmwla³

¹Department of Microbiology, Faculty of Medical Laboratory Sciences, University of El Imam El Mahdi, Kosti city, Sudan

²Department of Medical Laboratory Investigations, Kosti Police Hospital, Sudan

³Department of Medical Laboratory Investigations, Kosti Teaching Hospital, Sudan

Correspondence: Babiker Saad Almgadam, Department of Microbiology, Faculty of Medical Laboratory Sciences, University of El Imam El Mahdi, Kosti city, Sudan, Tel 00249917717034, Email Babiker888@yahoo.com

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Abbreviations: CKD, chronic kidney disease; ESRD, end stage renal disease; HCV, hepatitis C virus; HIV, human immunodeficiency virus; ICT, immunochromatographic test; SPSS, statistical package for social sciences

Introduction

Dialysis is a process of removing waste and excess water from blood; and is using primarily as an artificial replacement for lost of kidney function in people with kidney failure. Hemodialysis is routinely using as renal replacement therapy for end stage renal disease (ESRD) patients.¹ In 2012, 2.1 million patients worldwide were estimated to require hemodialysis and this number is expected to increase by 7% annually.² Prolonged vascular exposure puts hemodialysis patients at increased risk for infection by blood-borne pathogens, including hepatitis C virus (HCV) and human immunodeficiency virus (HIV) from contaminated devices, equipments, supplies, and environmental surfaces or attending personnel's.^{3,4} Regular detection of HIV, and HCV may play an important role in control and prevention of transmission.⁵ This study was sought to determine the frequency of anti-HIV1/2, and anti-HCV seropositivity among hemodialysis patients attending Kosti Renal Dialysis Center in Kosti city of Sudan in order to provide data and guidance about the size and extent, prevention, and control of this problems.

Materials and methods

This a cross sectional, hospital base study, carried out in Kosti Renal Dialysis center during the period from 15 August to 20 November 2017. A total of 100 blood samples were collected from hemodialysis patients. Each sample was left at room temperature for a few minutes then centrifuged at 3000 revolutions per minutes (rpm) for 10 minutes to obtain serum.⁶ Each serum sample was tested for anti-HCV, and

anti-HIV1/2 using lateral flow immunochromatographic tests kits (Humasis) according to manufacture instructions.^{7,8}

Ethical statement

This was approved by Department of Microbiology, University of El Imam El Mahdi. Verbal consent was taken from each participant.

Statistical analysis

The collected data were analyzed using statistical package for social sciences (SPSS) software version 21 and presented in form of tables. Chi square test was performed and *P* value of ≤ 0.05 was considered significant in a comparative data.

Results

The frequency of anti-HCV, and anti-HIV1/2 were 5% (5/100), and 0% (0/100) respectively as shown in Table 1. There is non significant difference in the frequency of anti-HCV between men and women, *P* value more than 0.05 as seen in Table 2. Also our study results did not provide sufficient evidence to conclude the possibility of HCV infection are increase with the duration of hemodialysis, as displayed in Table 3.

Table 1 Frequency of anti-HCV, and anti-HIV1/2 among Hemodialysis patients

Frequency	Anti-HCV	Anti-HIV1/2
Positive	5%(5/100)	0% (0/100)
Negative	95%(95/100)	100%(100/100)
Total	100	100

Table 2 Frequency of anti-HCV in hemodialysis patients among sex.

Sex	Number	Anti-HCV	
		Positive	Negative
Male	68	4.4%(3/68)	95.6%(65/68)
Female	32	6.3%(2/32)	93.7%(30/32)
P value		0.694	

Table 3 Frequency of anti-HCV antibodies among the duration of hemodialysis.

Duration/per year	Total of patients	Anti-HCV	
		Positive	Negative
From one day – up to 2 years	37	2.7% (1/37)	97.3% (36/37)
More than 2 – up to 4 Years	34	5.9% (2/34)	94.1% (32/34)
More than 4 – up to 6 Years	9	0% (0/9)	100% (9/9)
More than 6 – up to 8 Years	10	10% (1/10)	90% (9/10)
More than 8 – up to 10 Years	6	0% (0/6)	100% (6/6)
More than 10 – up to 12 Years	4	25% (1/4)	75% (3/4)
P value		0.398	

Discussion

Hemodialysis is essential and vital process in successful treatment of chronic kidney disease (CKD), however patients under hemodialysis have an increased risk of exposure to HCV and HIV infections. Our data showed that the frequency of anti-HCV, and anti-HIV1/2 among patients under hemodialysis were 5% (5/100), and 0% (0/100) respectively, that are low when compare with many previous studies in different countries. For example it is low when compare with Luma H A et al., study (Cameroon, 2017) that reported the frequency of anti-HCV and anti-HIV1/2 were 19.2%, and 13.5% respectively [9]. Also it is very lower than Abumwais J and Idris OF study (Jenin, 2010) which reported the frequency of anti-HCV was 24.68 % [10]. And highest than Reddy G A et al., study (India, 2005) that reported the frequency of anti-HCV and HBVsAg together was 1.4% [11]. While this study agree with Abumwais J and Idris OF study (Jenin, 2010), and Bahri F et al., study (South Iran, 2016) as they reported the frequency of anti-HIV1/2 was 0% [10,12]. Also our findings agree with Reddy G A et al., study (India, 2005) and AW Tu et al., study (British, 2009) which reported the frequency of anti-HCV were 5.9% and 5.4% respectively [11,13]. The difference in anti-HCV and anti-HIV1/2 seropositivity of our study when compare with previously mentioned studies may a result of difference in study population or sample size.

Our study found the frequency of anti-HCV was 4.4%(3/68) in men and 6.3%(2/32) in women; and there is non significant difference in possibility of HCV infection with the duration of hemodialysis. Our study results are markedly low when compare with Abumwais J and Idris OF study (Jenin, 2010) that reported the frequency of anti-HCV was 52.6% in men and 47.4% in women [10]. The absence of significant difference in the frequency of anti-HCV between women

and men; and among the duration of hemodialysis need to be confirm using large sample size.

Conclusions

Hemodialysis can expose patients for harms, and infections. The emergence of Blood borne pathogenic infections among hemodialysis patients has become a major public health threat worldwide. Continuous surveillance and implementation of control program can aid in the elimination and eradication of this problems. Further study need to focus on preventive measures with specialize emphasis and locking for ways to prevent transmission of virus or to inactive virus infectivity.

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Author Contribution

All authors were contributed for designing of study; and collection and laboratory analysis of samples. BSA was supervised the work and wrote the article. RNA and TR were revised the article.

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Conflicts of Interest

The author declares no conflict of interest.

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