Associated Factors of Viral Hepatitis Transmission among Hemodialysis Adult Patients

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KEYWORDS

Hepatitis, Hemodialysis, ESRD, Prevalence, Risk factors

ABSTRACT

Background: Individuals suffering from chronic kidney disease (CKD) are more likely to die, particularly those with end-stage kidney disease. Surprisingly, these deaths are related to many diseases, and this mortality rate motivates us to identify additional risk factors that can be modified to improve survival in patients requiring hemodialysis. Hepatitis virus infection has been associated with many comorbidities other than the liver, such as kidney disease, cardiovascular disease, insulin resistance, diabetes mellitus, and lymphoproliferative disease.
Objective: To estimate the hepatitis prevalence in hemodialysis units and assess the risk factors contributing to viral hepatitis infection in hemodialysis centers.
Materials and Methods: Cohort study design conducted in dialysis centers-Najaf AL Ashraf\ Iraq , , May 2023. The sample was collected by questionnaire and by referring to patient records to measure the prevalence of viral hepatitis.
Results: 72 patients with hepatitis in hemodialysis centers responded to study. Their ages ranged from 20-78 years. The group of participants (41-60 years old) constituted approximately half of sample, and the percentage of sex was males more than females. The prevalence of viral hepatitis was 10.3 %. Among patients with hemodialysis treatment, hepatitis B virus is less than C.

1. Introduction

Patients on hemodialysis are more susceptible to viral hepatitis for a variety of linked reasons. A serious medical condition that can harm the liver and perhaps result in death is viral hepatitis [1]. These factors might range from patient behavior to the particulars of the hemodialysis process. This article's goal is to look at hemodialysis patients' risk factors for viral hepatitis [2]. The World Health Organization's (WHO) World Hepatitis Report estimates that 3.5% and 1% of persons, respectively, had chronic HBV infections in 2015. According to the research, there have been an estimated 1.34 million deaths from viral hepatitis since 2000, representing a 22% increase in the mortality rate. The consequences of long-term HBV (66%) and HCV (30%) infections were responsible for 96% of these deaths [3]. After it was discovered that the virus may cause hepatitis acquired by blood transfusions, the second urban hemodialysis center in the United States reported a 12% prevalence rate of HCV infection in 1990 [4]. The Dialysis Outcomes and Practice Patterns Study (DOPPS) found that the mean prevalence rate of HCV infection in hemodialysis facilities was 13.5% (with a range of 2.5% to 23%) based on data from a selection of hemodialysis facilities in Europe, Japan, and the US between 1998 and 2001. Additionally, among hemodialysis patients in 12 different countries between 1996 and 2011, a seroprevalence rate of 9.5% was reported [5]. Hepatitis B is a chronic illness that can lead to serious liver issues. Early detection, treatment, and behavioral changes can prevent these outcomes or lessen their severity. It is recommended that adults and children receive the hepatitis B immunization. In contrast to Hepatitis B, Hepatitis C does not have a vaccine; rather, it can be treated with antiviral medications [6]. A Saudi Arabian study suggests that HD is one of the main risk factors for the spread of viral hepatitis. The frequency of viral hepatitis infection varies significantly between dialysis centers and between countries [7]. Among various risk groups, dialysis patients have been found to have one of the highest incidences of antibodies against viral hepatitis. Therefore, 49.9% of HD patients had anti-HCV overall, according to clinical measurements and questionnaires [8]. Chronic kidney disease (CKD) is most likely to be fatal for people with end-stage renal disease. Remarkably, more than half of fatalities are related to cardiovascular disease (CVD). Because of the high fatality rate, scientists are motivated to identify new risk factors that may be changed to improve hemodialysis patients' chances of survival. Chronic hepatitis infection has been associated with many comorbidities in addition to liver

disease, such as renal illness, cardiovascular disease, insulin resistance, diabetes mellitus, and lymphoproliferative disease [9]. Over 30% of hemodialysis patients are exposed to the virus, increasing their risk of morbidity and mortality, and 3% of individuals globally have hepatitis, according to recent research [10].

2. Methodology

A cohort study design was carried out in May 2023 at dialysis centers in Najaf, Al-Ashraf, and Iraq. The prevalence of viral hepatitis was determined by administering a questionnaire and consulting patient records. Sadr Medical City's Dialysis Center and Kidney Disease: The center houses multiple departments: the Department of Kidney Transplantation; the department of Peritoneal Dialysis; and the Department of hemodialysis, which is divided into three separate halls: negative; positive for hepatitis B; positive for hepatitis C; and the department of kidney diseases. Consequently, Al-Hakim General Hospital's Dialysis Center: Only has two departments: one for hemodialysis (which consists of three halls for patients who test positive for hepatitis B or C), and another for peritoneal dialysis. Seven hundred patients visit on average. Non-probability sampling was collected (convenience). The 72 patients (10.3% of the target population) who were receiving hemodialysis at the two previously indicated sites made up the sample; 60% of the patients were male and 40% were female. A questionnaire and patient records are the study tools. An instrument was created and prepared for the current investigation after a thorough evaluation of pertinent literature. (concerning patients) consists of three parts:

Part I: Sociodemographic Data of Patients and some clinical characteristics.

Part II: Prevalence of hepatitis B and C virus

Ethical Approval: The goals and questionnaire were presented to the scientific committee college once the validity of the study questionnaire was established. The committee college assessed the study instrument (questionnaire) and decided to move forward with the study after receiving clearance. A letter of authorization to start the trial on June 4, 2023. On June 18, 2023, formal clearance was received from the Najaf Governorate's Health Department

3. Result and Discussion

The data analysis results are methodically shown in tables that align with certain study objectives.

Table1: Distribution of the sample based on patients' demographic characteristics among 100 hemodialysis adult patients.

Sociodemographic Data of Patients	**Interval**	**f**	**%**
Age	Less than 40 years	24	33.3
	40 – 60 years	35	48.6
	More than 60 years	13	18.1
	Total	72	100
Sex	Male	43	60
	Female	29	40
	Total	72	100
Level of Education	Illiteracy	16	22.2
	Primary	34	47.2
	Secondary	17	23.6
	Bachelor and more	5	7
	Total	72	100
Marital Status	Single	18	25
	Married	54	75
	Total	72	100

Occupation status	Works	29	40
	Does not work	43	60
	Total	72	100
Economic status	sufficient	5	7
	Sufficient some thing	12	16
	Insufficient	55	77
	Total	72	100
Residency	Urban	48	66
	Rural	24	34
	Total	72	100
Duration of H.D. treatment	Less than 1 year	17	24
	1- 5 years	40	56
	More than 5 years	15	20
	Total	72	100
Number of blood transfusion	Less than 1 month	37	51
	1- 5 months	22	31
	6 months and more	13	18
	Total	72	100

The frequency distribution of the demographic traits of hemodialysis patients is displayed in this table. 48.6% are in the 40- 60 age range. 60% of the sample consisted of male. 47.2 % of the sample had only completed primary school. Married individuals made up 75% of the sample, which was the majority in terms of marital status. In the case of occupation status, does not work made up the greatest portion of the sample—roughly 60%. However, 77% of the sample had economic status are insufficient. 66% of the sample was urban. Duration of hemodialysis was 1-5 years 56%. treatment Finally yet importantly, number of blood transfusion less than 1 month was 51%.

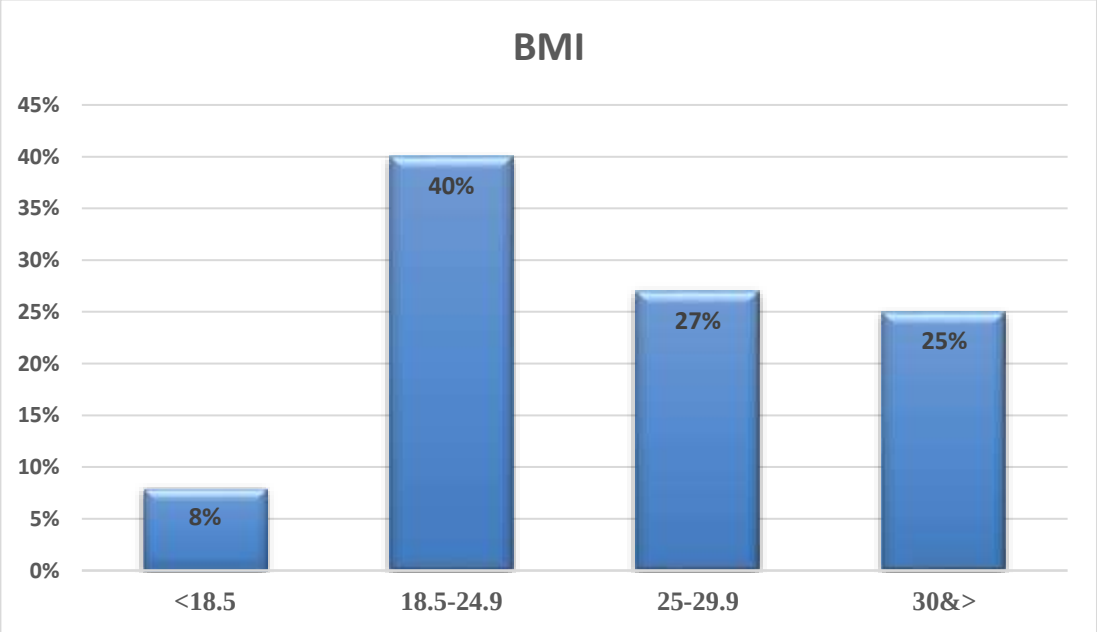

Figure (1) shows the body mass index of the study sample of patients

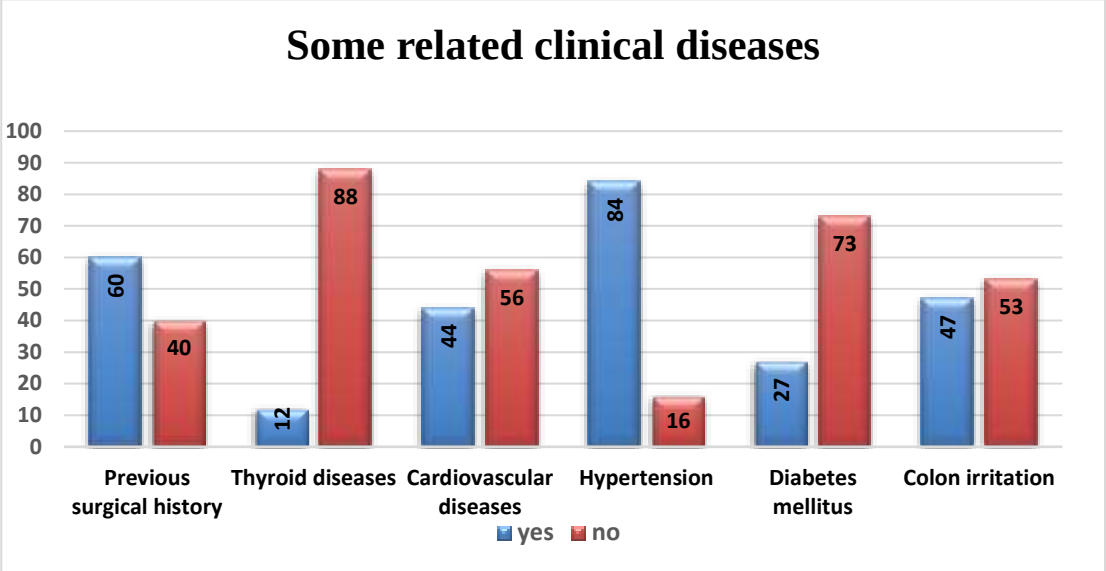

Figure (2) shows the presence of some related clinical diseases in the study sample of patients

Table 2: Distribution of the prevalence of hepatitis B and C virus within 72 patie**nts**

No.	Infection years	Type of H.V.	f	%
1	2014	HBV	2	13.9
		HCV	8	
2	2015	HBV	1	11.15
		HCV	7	
3	2016	HBV	1	11.15
		HCV	7	
4	2017	HBV	1	9.7
		HCV	6	
5	2018	HBV	1	9.7
		HCV	6	
6	2019	HBV	5	19.4
		HCV	9	
7	2020	HBV	3	13.9
		HCV	7	
8	2021	HBV	1	6.9
		HCV	4	
9	2022	HBV	1	2.8
		HCV	1	
10	2023	HBV	1	1.4
		HCV	0	
Total		HBV	16	100
		HCV	56	

Displays distribution of the prevalence of hepatitis B and C virus within 72 individuals along with the risk factors for viral hepatitis infection. Hemodialysis patients had a prevalence rate of 10.2 % for hepatitis C and B during the past ten years (2014-2023). 22% was HBV and 78% was HCV.

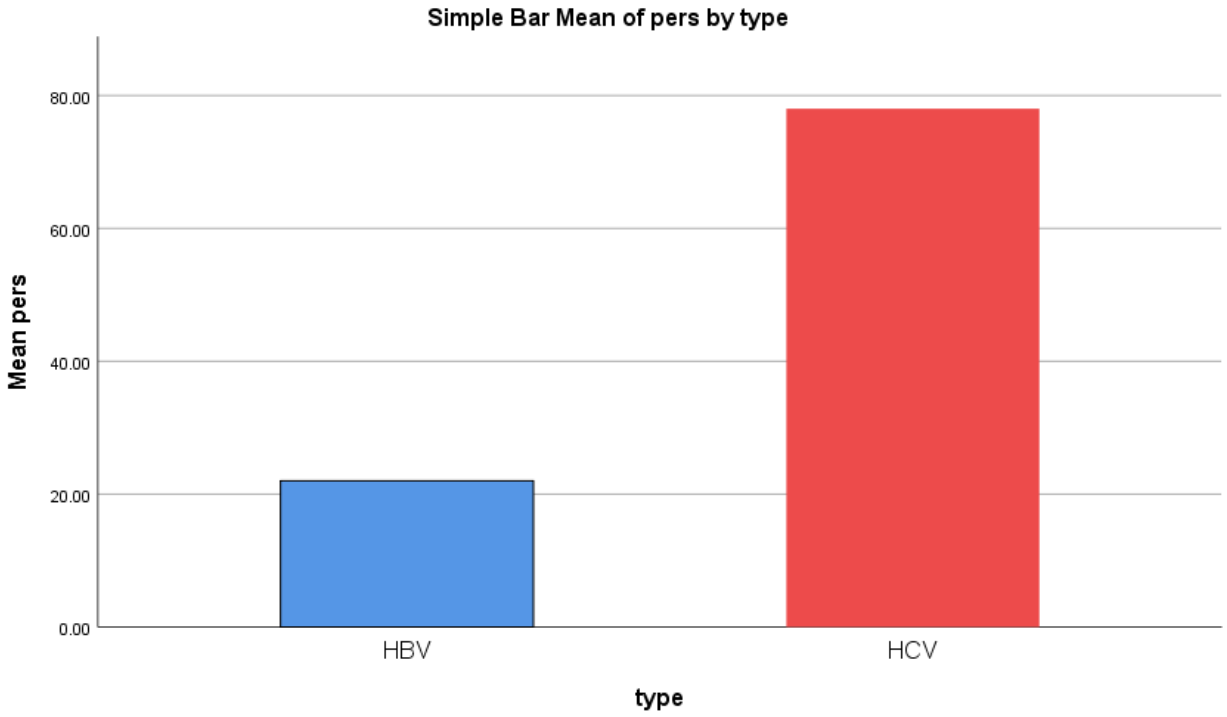

Figure 1: Total prevalence of hepatitis virus among hemodialysis patients in Najaf Governorate

Discussion

Current study, the sample consisted of 72 patients, there were more males than females, and this study is consistent with a study conducted in Kerman, Iran. The sample number was 100 for a target population of 500 patients undergoing hemodialysis [11]. In terms of sex, more than half of the sample was male, marital status was the majority of married people, and primary school was the majority in the current study sample. Likewise, the occupational status of does not work was the majority, and insufficient economic status was the majority. The majority of the sample had a duration of treatment with hemodialysis, and those who received blood transfusions in a period of less than a month were the most valuable in the sample who were at risk of contracting viral hepatitis. This is consistent with a study conducted in the Iraqi province of Najaf [12].

The prevalence rate of viral hepatitis was consistent with many previous studies, and the majority of the prevalence rate was for type C. In addition, a high infection rate was observed for patients undergoing hemodialysis in 2019 due to the country's exposure to the COVID-19 pandemic, which led to the exhaustion of many laboratory investigations and physical effort. Which negatively affected the attention to the viral hepatitis virus at that time, a study conducted in the Iraqi province of Hilla is consistent with the case study with all the results mentioned above [13].

4. Conclusion and future scope

According to the current study, 10.2% of patients receiving hemodialysis have a chance of developing viral hepatitis after hemodialysis. Before starting the hemodialysis procedure, healthcare personnel, especially nurses, must ensure the integrity of laboratory investigations for every patient in order to stop the hepatitis virus from spreading from positive to negative patients.

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Conflicts of interest

There are no conflicts of interest

Reference

[1] Jayes D, Merrick R, Pulford C, Buitendam E, Mohammed H, Saunders J. What is the role of sexual health services in the delivery of primary prevention of sexually transmitted infections? A narrative review. Sexual Health. 2022 Aug 4.

[2] Abady NR, Al-Al Hindi ZS. A Cytokine That Is Involved in Immune Responses in Chronic Hepatitis B Virus Patients. Medical Journal of Babylon. 2024 Jan 1;21(1):191-4.

[3] ALJARALLAH BM. Hepatitis B and C Viral Infections among Dialysis Patients and Related Factors of Dialysis Centres in Saudi Arabia. Journal of Clinical & Diagnostic Research. 2022 Jan 1;16(1).

[4] Agha NF. Seroprevalence of antinuclear antibodies, antibrucella antibodies, and hepatitis B surface antigen in women with recurrent abortion. Medical Journal of Babylon. 2020 Apr 1;17(2):159-64.

[5] Nguyen DB, Bixler D, Patel PR. Transmission of hepatitis C virus in the dialysis setting and strategies for its prevention. InSeminars in dialysis 2019 Mar (Vol. 32, No. 2, pp. 127-134).

[6] Wong WC, Marley G, Li J, Yan W, Chan PL, Tucker JD, Tang W, Ni Y, Cheng DD, Cong L, Seto WK. A randomized controlled trial enhancing viral hepatitis testing in primary care via digital crowdsourced intervention. npj Digital Medicine. 2022 Jul 19;5(1):95.

[7] Abed AK, Alkhafaji ZA, Abood AJ. Serological detection of hepatitis B virus e antigen and TNF-α in a dialysis patient. Medical Journal of Babylon. 2023 Oct 1;20(4):771-6.

[8] Al-Khattabi GH. Antibodies Against Hepatitis C Virus (Anti-HCV) among Hemodialysis Patients in Makkah, Saudi Arabia. Journal of Advanced Research in Applied Sciences and Engineering Technology. 2022 Aug 8;27(1):62-76.

[9] Kadhim, Z. K., & Khudair, F. W. (2019). Outpatients' Attendants Knowledge Regarding Antibiotics Use and Antibiotics Resistance in Al-Najaf Al-Ashraf City Health Institutions. *Indian Journal of Public Health Research & Development*, *10*(8).

[10] Hussein MM, AL Sabaagh SJ, Khalaf AM. Hepatitis B and C virus prevalence and risk factors among hemodialysis patients in Al-Muthanna city, Iraq. InAIP Conference Proceedings 2024 Feb 16 (Vol. 3051, No. 1). AIP Publishing.

[11] Nakhaie M, Taheri E, Charostad J, Arefinia N, Ahmadpour F. Prevalence of Hepatitis C Virus and Its Occult Infection in Hemodialysis Patients. Jundishapur Journal of Microbiology. 2023 Aug 11.

[12] Alnaffakh MS, Alnassar HG, Al-Hchaim MH. Risk Factors for Patients with Hepatitis B and C in Hemodialysis Unit. Medical & Clinical Research. 2023 Sep 12;8(9):1-8.

[13] Shlash AM, Hindi NK, Radhi MM, Alshemari BA, Albaghdadi DS, Hassan H, ZoghairAlmohamadawi HS. Infection Control Measures for Nurses Staff Concerning with Hepatitis B and C at Hemodialysis Unit in Hilla Hospitals. Medico-legal Update. 2020 Jan;20(1):735.