SEROLOGICAL AND MOLECULAR PROFILE OF HEPATITIS B AND C VIRUSES AND DETECTION OF OCCULT HBV AMONG HEMODIALYSIS PATIENTS IN DUHOK, IRAQ

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ABSTRACT

Background: Hepatitis B and C viral infections are significant global health concerns, with hemodialysis patients being more susceptible than the general population.
Objectives: The study aimed to assess the prevalence of HBV and HCV infections among hemodialysis patients and detect occult HBV infections.
Methods: The study involved 151 patients with end-stage renal illness, comprising 81 males (53.6%) and 70 females (46.4%) at the Kidney Center's dialysis unit in Duhok, Iraq. All subjects had their blood samples taken prior to hemodialysis. HBsAg, total anti-HBc, anti-HBs, anti-HCV, and liver enzyme screening were done. HBsAg-negative samples were analyzed for occult HBV. Anti-HCV-positive patients were subjected to PCR. Clinical and demographic data were collected and analyzed.
Results: Participants ranged in age from 15 to 96, with a mean age of 55.85±15.50 years. Out of 151 samples, one (0.7%) tested positive for HBsAg, and 3 (2.0%) tested positive for anti-HCV antibodies. 37 samples (24.5%) were positive for anti-HBc, and 31 (79.5%) were also positive for anti-HBs antibodies. Occult HBV infection was detected in 2 (2.1%). Anti-HCV-positive samples turned negative by PCR. Significant correlation was revealed between anti-HBc results and duration of dialysis (P=0.024), while anti-HCV positivity was significantly correlated with dialysis duration (P=0.005) and history of kidney transplantation (P=0.046).
Conclusions: Active HBV and HCV infections were uncommon, yet the presence of occult HBV indicates an ongoing risk of silent viral transmission. These findings support the need for regular serological and molecular screening in dialysis centers to enhance early detection, prevent outbreaks, and strengthen vaccination and infection-control measures.

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Keywords: Hemodialysis, Hepatitis B virus, Hepatitis C virus, Occult HBV infection, Anti-HBc antibodies

Hepatitis viruses are the primary hepatotropic pathogens that may induce a variety of illness forms, including asymptomatic, acute, chronic, and fulminant hepatitis[1]. End-stage renal disease (ESRD) is a progressive and irreversible kidney function issue. End-stage renal disease is most commonly treated with hemodialysis (HD), in which an amount of the patient's blood passes through a specialized filter that eliminates waste products and extra fluids at one time[2]. Patients receiving hemodialysis are more likely to have hepatitis B virus (HBV) and hepatitis C virus (HCV) infections than the general population. Because hemodialysis patients are exposed to inadequate, contaminated medical equipment, their bodies are more susceptible to acquiring this infection[3]. Furthermore, blood transfusions are necessary for many hemodialysis patients who suffer from anemia due to chronic renal disease. Infections may result from

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these transfusions if they are contaminated[4]. In addition, people with renal illness may be less able to rid the HBV and HCV infections due to compromised immune system. Moreover, it has been observed that hemodialysis patients had a lower optimum response to the HBV vaccination than the general population, which does not get dialysis treatments[5]. These infections in hemodialysis patients are linked to a higher risk of dying from cardiovascular diseases and mortality from all causes, in addition to death from liver disease[6]. Although there is currently no viable vaccination, HCV may be treated with extremely potent antiviral drugs, which can reduce consequences. However, because the HCV infection is asymptomatic, it could go undetected[7]. HBV surface antigen (HBsAg)-negative people who have a small amount of HBV DNA in their blood and hepatocytes (less than 200 IU/mL) are considered to have occult hepatitis B virus (HBV) infection (OBI). These individuals may test positive or negative for prior infection-related serological markers[8]. Hemodialysis patients with occult HBV infection may be at risk for transmission, renewal, and the advancement of liver disease. The reactivation of an occult HBV infection may occur after kidney transplantation or other immunosuppression circumstances like chemotherapy or HIV infection [9]. This research is important in Duhok because data on HBV and HCV among dialysis patients are limited, and these patients are at high risk of infection. Understanding local prevalence and immunity helps improve infection control, vaccination, and patient safety in dialysis centers. The main objective of the study was to determine the prevalence of HBV and HCV among dialysis patients, evaluate the level of protection against HBV in HBsAg-negative individuals, identify cases of occult HBV infection using PCR, and compare patients with current or past HCV infection to those without a history of HCV.

METHODS:

Study Design and subjects

From October 2024 to May 2025, cross-sectional research was conducted at the Duhok Kidney and Diseases Transplantation Center in Duhok, Kurdistan Region, Iraq. A non-random judgmental sampling method was used to include all patients undergoing hemodialysis who met the inclusion criteria, which required being an ESRD patient receiving regular dialysis and agreeing to participate in the study. Patients who chose not to participate were excluded. Accordingly, 151 patients undergoing regular dialysis during the study period were included, which is statistically justified. written informed consent was acquired from each participant, Interviews were conducted using a structured questionnaire designed specifically for this study. The questionnaire included demographic information (age, gender, and job), comorbid conditions such as hypertension and diabetes mellitus, personal dialysis history (duration of dialysis, dialysis route, and history of kidney transplantation), and clinical history related to potential viral exposure, including previous blood transfusions. The Directorate General of Health's Research Ethics Committee granted permission for this study on September 25, 2024, under number 25092024-8-28.

Sample collection

Venous blood samples were collected from each participant before dialysis for serological and molecular analysis. Serum was separated for serological testing, and plasma was prepared for molecular assays. All samples were stored at -40°C until testing and thawed only once to prevent degradation.

Serological Testing

Serological testing for HBsAg and anti-HCV antibodies was performed using a VIDAS analyzer. As for the measurement of liver enzymes (ALT and AST), the Cobas c 311 analyzer was employed. The

LIAISON® XL analyzer was used to perform the serological tests for anti-HBc and anti-HBs antibodies using chemiluminescence immunoassay (CLIA) techniques, employing the LIAISON® Anti-HBc kit and the LIAISON® XL MUREX Anti-HBs kit (Diasorin, Italy). Anti-HBc antibodies were qualitatively detected, while anti-HBs antibodies were quantitatively measured, with concentrations of ≥10 mIU/mL considered indicative of protective immunity against HBV. Molecular Testing

Occult HBV infection

In order to rule out occult hepatitis B virus (HBV) infection, samples that tested negative for the hepatitis B surface antigen (HBsAg) underwent molecular testing to detect HBV DNA. Viral DNA was extracted from plasma samples using the AddPrep Genomic DNA Kit, and HBV DNA was subsequently detected with the AddMedi HBV Real-time PCR Kit. Both kits were supplied by (Addbio,Korea) and used according to the manufacturer's protocols. Viral DNA was amplified using the CFX96 Touch Real-Time Detection System (Bio-Rad). HCV RNA Detection

samples that tested positive for HCV by anti-HCV antibody were subsequently tested for HCV RNA. As directed by the manufacturer, RNA was extracted from plasma samples using the QIAamp Viral RNA Mini Kit, and HCV RNA was amplified and detected using the Artus HCV RG RT-PCR Kit, both from (Qiagen, Germany), on the Rotor-Gene Q instrument.

Statistical Analysis

All data were analyzed using SPSS version 25. Descriptive statistics were used to summarize the participants' characteristics. Categorical variables were presented as numbers and percentages, while continuous variables were expressed as means ± standard deviations (SD). Comparisons between groups were performed using the independent t-test for continuous variables and the Pearson chi-square test and Fisher's exact test for categorical variables. A p-value < 0.05 was considered statistically significant throughout the analysis.

RESULTS

A total of 151 patients undergoing dialysis were included in the study, among them, 81 (53.6%) were males and 70 (46.4%) were females. Most participants were aged 56–66 years (51.7%), followed by 46–55 years (25.2%). Gender distribution was fairly balanced across all age groups. Distribution of study participants by age group and gender [Table 1].

Table 1: Distribution of study participants by age group and gender

Age group	N% N=151	Gender N (%)	
		Male (n=81)	Female (n=70)
15-25	7(4.6%)	4(4.9)	3(4.3)
26-35	13(8.6%)	8(9.9)	5(7.1)
36-45	15(9.9%)	8(9.9)	7(10)
46-55	38(25.2%)	21(25.9)	17(24.3)
56-66>	78(51.7%)	40(49.4)	38(54.3)
Total	**151(100%)**	**81(53.6%)**	**70(46.4%)**

Among the dialysis patients, the most common jobs were housewives (42.4%) and unemployed (34.4%). Hypertension was the most frequent comorbidity (44.4%), followed by combined hypertension and diabetes (39.1%). Most patients had been on dialysis for 12-24 months (39.7%), and 66.9% had a history of blood transfusion, and 13.2% had a history of kidney transplantation [Table 2].

Table 2: General characteristics of studied participants

Variable	Category	*N*	*%*
Job	Employee	15	9.9
	House wife	64	42.4
	Retired	18	11.9
	Student	2	1.3
	Unemployed	52	34.4
Comorbid conditions	Hypertension	67	44.4
	Diabetes Mellitus	5	3.3
	Hypertension & Diabetes mellitus	59	39.1
	Others	20	13.2
Duration of Dialysis (months)	<12	50	33.1
	12-24	60	39.7
	25-36	12	7.9
	≥36	29	19.2
History of Blood Transfusion	Yes	101	66.9
	No	50	33.1
Dialysis route	C.V line	68	45.0
	Fistula	82	54.3
	Graft	1	0.7
History of Kidney Transplantation	Yes	20	13.2
	No	131	86.8

Among the dialysis patients, HBsAg was positive in 1 patient (0.7%), while anti-HBc was positive in 37 patients (24.5%). Protective anti-HBs antibodies (≥10 mIU/mL) were found in 31 patients (83.8%). HBV DNA was detected in 2 patients (2.1%) from 95 HBsAg-negative individuals, indicating occult HBV infection. Regarding HCV markers, 3 patients (2.0%) were anti-HCV positive, but none had detectable HCV RNA [Table 3].

Table: 3 HBV and HCV serological and molecular profile

Serological markers and molecular profile		*N*	*%*
HBs Ag	Positive	1	0.7
	Negative	150	99.3
Anti-HBc	Positive	37	24.5
	Negative	114	75.5
Anti HBs Ab*	Positive ≥10 mIU/mL	31	83.8
	Negative <10 mIU/mL	6	16.2
HBV DNA**	Positive	2	2.1
	Negative	93	97.9
Anti HCV	Positive	3	2.0
	Negative	148	98.0
HCV RNA***	Positive	0	0
	Negative	3	100

*Anti HBs Ab for positive anti-HBc; **Real time PCR done for 95 HBsAg negative patients; ***HCV RNA for positive anti-HCV

There was no significant difference in age between Anti-HCV–positive and –negative patients. Anti-HCV positivity was significantly associated with longer dialysis duration ($p = 0.005$) and with a history of kidney transplantation ($p = 0.046$). Blood transfusion history and liver enzyme levels (ALT, AST) showed no significant associations ($p > 0.05$). Participant characteristics by anti-HCV status are shown in [Table 4].

Table: 4 Association of Positive Anti HCV and Negative Anti HCV with characteristics of studied participants

Characters		Positive Anti HCV N=3	Negative Anti HCV N=148	P value
Age (mean ±SD)		56.00±18.52	55.84±15.51	0.986 *
Dialysis duration (months)	<12	0	50(33.8%)	**0.005** **
	12-24	0	60(20.5%)	
	25-36	0	12(8.1%)	
	≥36	3(100%)	26(17.6%)	
History of Blood Transfusion	Positive	3(100%)	98(66.2%)	0.551 ***
	Negative	0	50(33.1%)	
History of Kidney Transplantation	Positive	2(66.7%)	18(12.2%)	**0.046** ***
	Negative	1(33.3%)	130(87.8%)	
ALT (mean ±SD)		11.67±2.89	17.55±14.27	0.478 *
AST (mean ±SD)		11.00±4.36	18.87±17.08	0.428 *

* Independent t-test, ** Pearson chi square and *** Fisher's exact test were used to perform the statistical analysis. Bold numbers regarded as statistically significant p<0.05

The distribution of Anti-HBc status varied among enrolled patients (Figure 1), with Anti-HBc positivity more frequent among patients with longer dialysis duration, while Anti-HBc negativity predominated among those with shorter durations.

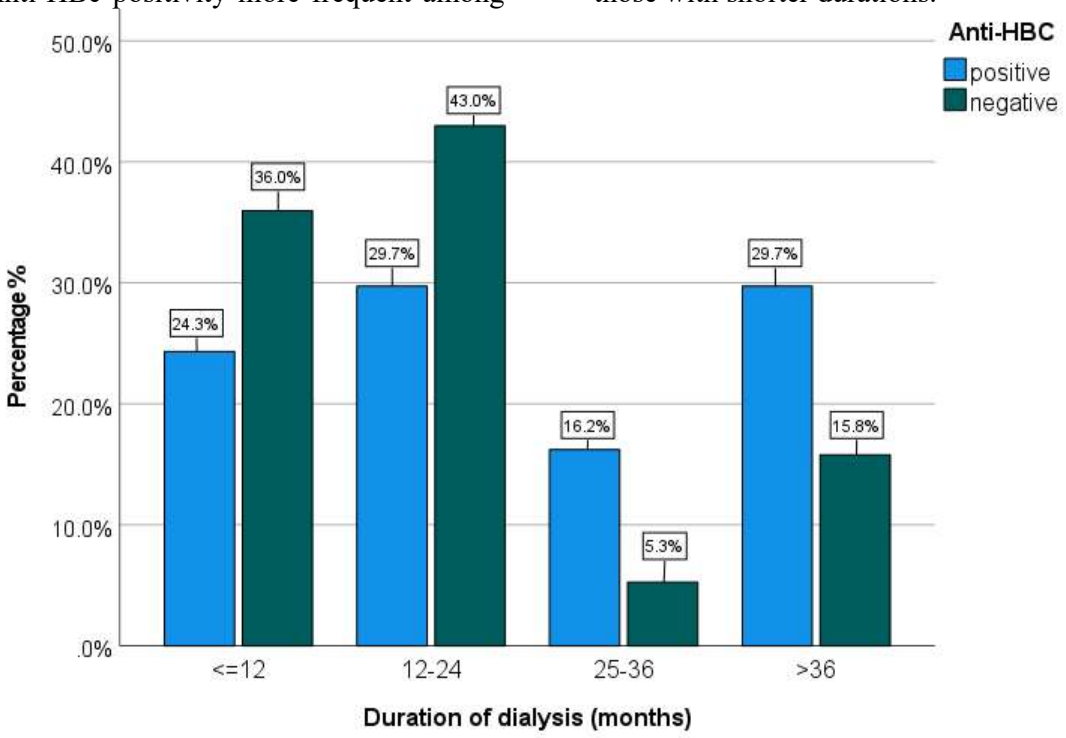

Figure 1. Relationship between anti-HBc serostatus and duration of dialysis in the studied patients.

Among HBV DNA positive cases (n=2), all were anti-HBc negative. In the HBV DNA negative group, 38.7% were anti- HBc positive and 61.3% negative, with no significant d0ifference (p=0.524). HBV DNA positive samples showed significantly higher ALT and AST levels compared to negatives (p <0.001), indicating a strong correlation with elevated liver enzymes [Table 5].

Table: 5 Association of Positive HBV DNA and Negative HBV DNA with Anti HBc and liver enzymes

Variables		Positive HBV DNA N=2	Negative HBV DNA N=93	P Value
Anti HBc	Positive	0	36(38.7%)	0.524 **
	Negative	2 (100%)	57(61.3%)	
ALT (mean ±SD)		86.5±113.84	16.35±7.51	**<0.001** *
AST (mean ±SD)		107.00±147.08	15.84±6.34	**<0.001** *

* Independent t-test and ** Fisher's exact test were used to perform the statistical analysis. Bold numbers regarded as statistically significant p<0.05

DISCUSSIONS:

In this study more than half of hemodialysis (HD) patients were 56 years or older, which align with international observations that end-stage renal disease (ESRD)increases markedly with age due to cumulative metabolic and vascular injury. Similar age patterns have been reported in Japan, France, Iran, and Korea[10,11]. Hypertension was the most frequent comorbidity, consistent with Dhaidan s' findings, where 63% of HD patients were hypertensive[12]. Most patients had been on HD for 12-24 months, comparable to the median one-year duration reported by Jardine et al. across China, Australia, and Canada[13]. Fewer long-term (>3years) dialysis cases, also noted in Spanish data[14]. The prevalence of HBsAg in this cohort was low (0.7%), similar to the 1.1% reported by Abubakeer et al.[15] and lower than rates in Iraq (3.7%), Saudi Arabia (4.6%), and Jordan (5.9%)[16,17,18]. This may be related to effective donor screening, dedicated HD machines, infection control practices, and sustained HBV vaccination efforts[19]. Despite negative HBsAg, 2.1% of patients had occult HBV infection (OBI), underscoring the need for molecular testing in HD patients, as serological screening alone may not be sufficient to identify OBI infection. our findings differ from studies in Iraq and Iran reporting no OBI cases,[16,20] yet align with Tang et al. who documented 2.1% patients had occult HBV infection[21]. Differences likely reflect variation in HBV endemicity, diagnostic sensitivity, and study populations[20]. In this study, anti-HCV positivity was 2%, lower than the 12.7% reported in Turkey[22], and well below global ranges (1.4-28.3%in developed 4.7-41.9% in developing countries)[23]. All anti-HCV-positive patients were HCV RNA negative, indicating no active replication, possibly reflecting the impact of antiviral therapy. No association was found with age or transfusion history, consistent with Taherkhani et al.[24]. However, all anti-HCV positive patients had been on dialysis for ≥ 36 months, this might be explained by the fact that longer dialysis duration was associated with a higher risk of infection. A significant association with prior kidney transplantation was observed, similar to Ashkani-Esfahani et al., who linked post-transplant immunosuppression with higher HCV risk[25]. Anti-HBc positivity was present in 24.5% of patients, suggesting that they were recovering from an acute or chronic hepatitis B infection. Our results, slightly higher than prior Iraqi reports (17.8%)[26]. Longer dialysis duration (>36 months) was significantly associated with anti-HBc positivity, likely reflecting repeated vascular access, transfusions, and cumulative exposure risk. The relationship between anti-HBc and HBV-DNA highlights the spectrum OBI, this attracts attention to the significant and critical concern about the possibility and potential of viral transmission through the dialysis machines during replacement therapy. Egyptian and Iranian studies reported anti-HBc positivity 8% and 9% respectively[27,28]. The disparity in the prevalence of isolated anti-HBc may be due to differences in the endemicity of chronic HBV infection in various geographic

distributions. Iraq is regarded as a low endemic country (less than 2%), but the sample size and the use of different serological tests with different levels of sensitivity may also be factors. The finding of two patients with HBV-DNA positivity is similar to other studies, because hemodialysis patients are more likely to have occult infections due to blood transfusion, chronic illness, and dialysis machine exposure[29]. Because of variations in tests, sample sizes, and the use of blood or liver samples for detection, the incidence of OBI varies. The presence of protective anti-HBs does not fully exclude OBI. Malagnino et al. reported OBI even in patients with anti-HBs titers >150 mIU/L, turning this into a questionable marker.

This point is crucial since it is the primary cause of viral reactivation when these patients are getting ready for a kidney transplant and the following usage of immunosuppressive medications[30]. According to guidelines established by the American and European Gastroenterology Societies, OBI patients receiving kidney transplants should keep an eye on their viral load and, if it is below identification, monitor their liver enzymes, since this may require antiviral therapy[31,32]. The observed differences in ALT and AST between positive and negative DNA patients emphasize the value of biochemical surveillance, as an initial sign that attracts attention to liver dysfunction that necessitate further assessment of the patient. As also recommended by Pascasio-Acevedo[33]. The detection of anti-HBc and/or anti-HBs in hemodialysis patients should not be considered as a protective marker; it should be followed by molecular tests to detect viral DNA to exclude OBI, and when deciding renal transplant therapy, follow them strictly since immunosuppressant therapy may reactivate the occult infection. The two patients with positive DNA results were anti-HBc negative, (seronegative), which represents 20% of OBI patients. Patients with seronegative OBI may have had anti-HBV antibodies at first but have now lost them, or they may have tested negative for antibodies when they were infected[34]. A limitation of the study was that the sample size could have affected the results, although we had enrolled all hemodialyzed patients within the study period. Information about vaccination status and history of risk factors acquired through patient interview was subjected to memory bias and might have been inaccurate.

CONCLUSION

Hemodialysis patients often have a poor immune response, which can lead to false-negative results in antibody tests. Additionally, HBV mutations may result in false-negative HBsAg test results, delaying the identification of infected patients and underestimating the true prevalence of infection. Accurate diagnosis requires PCR testing for HCV RNA and HBV DNA, especially in patients who may undergo kidney transplantation or receive immunosuppressive medications. Future studies should include larger sample sizes across multiple dialysis centers and longitudinal follow-up to monitor new HBV and HCV infections.

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پشک و تایبەتمەندیێن سیرۆلۆجی و گەردیلەیی بێن ڤایرۆسێن ئیلتیهابا جگەرێ B و C و دیتنا ڤایرۆسێ ئیلتیهابا جگەرێ B یێ ڤەشارتی ل دهۆک نەخوەشێن ششتنا گولچیسکان ل دهۆکێ - عیراق

پێشەکی و ئارمانج: هەوکردنا ڤایرۆسی یا جگەرێ ژ جۆرێ B و C ئاریشەکا ساخلەمیێ یا جیهانی یا مەزنە، و ئەو نەخۆشێن شیشتنا گولچیسکان بۆ دکەن پتر د بەر مەترسیێ دانە بۆ تووشبوونێ ب ڤان هەوکردنان بەراورد ب خەلکێ ئاسایی.

ئارمانج: ئارمانجا ڤێ ڤەکۆلینێ هەلسەنگاندنا بەلاڤبوونا هەوکردنا ڤایرۆسێ جگەرێ یێ B و C بوو دناڤ نەخۆشێن شیشتنا گولچیسکان دا، و دیارکرنا هەوکردنا ڤەشارتی یا ڤایرۆسێB .

ڕێکێن ڤەکولینێ: ڤەکۆلینێ 151 نەخۆشێن قۆناغا دویماهیێ یا نەخۆشیێن گولچیسکان بخۆڤە گرتن، 81 ژ وان زەلام بوون (53.6%) و 70 ژن بوون (46.4%) ل بنگەهێ شیشتنا گولچیسکان ل سەنتەرێ گولچیسکان ل دهۆک – عیراق. نموونەیێن خوینێ ژ هەمی نەخۆشان هاتنە وەرگرتن بەری ڕۆینشتنا شیشتنێ. پشکنینا ئەنتیجینێ ڕووکەشی یێ ڤایرۆسا هەوکرنا جگەرێ (HBsAg)، و پشکنینا دژەتەنێن گشتی (Total_Anti HBc)، و پشکنینا دژەتەنێن ڤایرۆسا هەوکرنا جگەرێ(Anti-HCV)، و هەروەسا پشکنینێن ئەنزیمێن جگەرێ هاتنە ئەنجامدان. ئەو نموونەیێن کو بۆ HBsAg نێگەتیڤ بوون، پشکنین بۆ هاتە کرن بۆ دیارکرنا هەوکردنا ڤەشارتی یا ڤایرۆسێ B. ئەو نەخۆشێن کو ئەنجامێن وان بۆ Anti-HCV پۆزەتیڤ بوون، پشکنینا PCR بۆ هاتە ئەنجامدان. هەروەسا پێزانینێن کلینیکی و دیموگرافی هاتنە کومکرن و خواندن لسەر هاتە کرن.

ئەنجام: ژیێ پشکداران دناڤبەرا 15 و 96 سالیێ دا بوو، و ناڤنجیا ژیێ وان 55.85 ± 15.50 سال بوو. ژ 151 نموونەیان، بتنێ ئێک نموونە (0.7%) بۆ HBsAg پۆزەتیڤ بوو، و 3 نموونە (2.0%) بۆ Anti-HCV پۆزەتیڤ بوون. لێ پشکنینا Anti-HBc دیار کر کو 37 نموونە (24.5%) پۆزەتیڤ بوون. 31 نموونە (79.5%) بۆ Anti-HBs ژی پۆزەتیڤ بوون. هەوکردنا ڤەشارتی یا ڤایرۆسێ B ل دەڤ دوو حالەتان (2.1%) هاتە دیارکرن. ئەو نموونەیێن کو بۆ Anti-HCV پۆزەتیڤ بوون، د پشکنینا PCR دا نێگەتیڤ دەرکەفتن. پەیوەندییەکا گرنگ هاتە دیتن دناڤبەرا ئەنجامێن دژە-HBc و ماوێ شوشتنا گورچیلەیان (P=0.024). ل گەل وێ چەندێ، ئەرێنییوونا دژە-HCV گرێدایە ب ماوێ دیالیزێ (P=0.005) و دیرۆکا ڤەگۆهاستنا گورچیلەیان (P=0.046).

دەرئەنجام: هەبوونا ڤایرۆسێن (HBV) و (HCV) بێن چالاک نە گەلەک بوو، لێ هەبوونا ڤایرۆسا (HBV) یا ڤەشارتی دیاردکەت کو هێشتا مەترسیەکا بەردەوام یا ڤەگوهاستنا بێدەنگ یا ڤایرۆسی هەیە. ئەڤ ئەنجامە پشتگیریێ ل گەرەنتیا پشکنینێن سیرۆلۆجی و گەردیلەیی بێن بێهنڤەدانێ د ناڤەندێن ششتنا گورلچیسکان دا دکەن، ب مەرەما: زێدەکرنا دیتنا زووبی، ڕێگریکرنێ ل رووبانا سەرێگێرتنێن ڤایرۆسی ، و بهێزکرنا ڕێکارێن کوتانێ و ڕێکێن کۆنترۆلکرنا تووشبوونێ.

الملف المصلي والجزيئي لفيروسي التهاب الكبد B و C والكشف عن فيروس التهاب الكبد B الخفي بين مرضى غسيل الكلى في دهوك – العراق

الخلاصة

الخلفية والأهداف: تعد العدوى الفيروسية بفيروس الكبد ب وفيروس الكبد س مشكلة صحية عالمية كبرى، حيث يكون مرضى غسيل الكلى أكثر عرضة للإصابة مقارنة بعامة السكان.

الهدف: هدفت الدراسة إلى تقييم مدى انتشار عدوى فيروس الكبد ب وفيروس الكبد س بين مرضى غسيل الكلى، والكشف عن العدوى الكامنة بفيروس الكبد ب.

الطرق: شملت الدراسة 151 مريضًا يعانون من مرض الكلى في مرحلته النهائية، منهم 81 ذكرا (53.6%) و70 أنثى (46.4%) في وحدة غسيل الكلى بمركز الكلى في دهوك، العراق. أخذت عينات دم من جميع المرضى قبل غسيل الكلى. أجري فحص HBsAg، وإجمالي الأجسام المضادة لـ HBc، ومضادات HBs، ومضادات HCV، وإنزيمات الكبد. حُللت عينات HBsAg السلبية للكشف عن التهاب الكبد B الخفي. خضع المرضى الإيجابيون لمضادات HCV لاختبار تفاعل البوليميراز المتسلسل (PCR). جُمعت المعلومات السريرية والديموغرافية وفحصت.

النتائج: تراوحت أعمار المشاركين بين 15 و96 عاما، بمتوسط عمر 55.85 ± 15.50 عاما. من بين 151 عينة، كانت نتيجة اختبار HBsAg واحدة (0.7%) إيجابية، وكانت نتيجة اختبار الأجسام المضادة لـ HCV في 3 عينات (2.0%) إيجابية. كانت نتائج 37 عينة (24.5%) إيجابية لمضاد التهاب الكبد الوبائي (HBc)، و31 عينة (79.5%) إيجابية أيضا لأجسام مضادة لـ HBs. تم الكشف عن عدوى فيروس التهاب الكبد الوبائي (B) الخفية في حالتين (2.1%). تحولت نتائج اختبار تفاعل البوليميراز المتسلسل (PCR) الإيجابية لمضاد التهاب الكبد الوبائي (C) إلى سلبية. تم الكشف عن ارتباط ذي دلالة إحصائية بين نتائج مضاد التهاب الكبد الوبائي (HBc) ومدة غسيل الكلى (P=0.024)، بينما ارتبطت إيجابية مضاد التهاب الكبد الوبائي (C) ارتباطا ذا دلالة إحصائية بمدة غسيل الكلى (P=0.005) وتاريخ زراعة الكلى (P=0.046).

الاستنتاجات: كانت حالات العدوى النشطة بفيروسي HBV وHCV غير شائعة، إلا أن وجود عدوى HBV الخفية يشير إلى وجود خطر مستمر لانتقال الفيروس بشكل صامت. وتدعم هذه النتائج ضرورة إجراء الفحوصات السيرولوجية والجزيئية المنتظمة في مراكز الغسل الكلوي لتعزيز الكشف المبكر، ومنع حدوث الفاشيات، وتعزيز إجراءات التطعيم ومكافحة العدوى.