بسم الله الرحمن الرحيم

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Title:

Frequencey of Heptitis B Infection Among Renal Failure at Al Jemaih Center of Dialysis, Dongola city

A Thesis submitted in fulfillment for the requirement of the MSc degree in Medical Laboratory Sciences (MICROBIOLOGY)

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الاية

بسم الله الرحمن الرحيم

(هُوَ الَّذِي جَعَلَ الشَّمْسَ ضِيَاءً وَالْقَمَرَ نُورًا وَقَدَّرَهُ مَنَازِلَ لِتَعْلَمُوا عَدَدَ السِّنِينَ وَالْحِسَابَ مَا خَلَقَ اللَّهُ ذَلِكَ إِلَّا بِالْحَقِّ يُفَصِّلُ الْآيَاتِ لِقَوْمٍ يَعْلَمُونَ)

[يونس: 5]

Dedication

Every challenging work need self efforts as well as guidance of olders especially those who were very close to our heart

My Father

For earning an honest living for us and for supporting and encouraging me to belive in my self

My Mother

Astrong and gentle soul who taught me to trust in Allah’ belive in hard work and that so much could be done with little

All my family, sister and brother

Acknowlegment

I would like to thanks the patients and staff on Aljemaih hemodialysis center, espically to Eman and sister Fatima, Zaienb, and Sitana .

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Also Iwould like to express my deep gratitude to my friends Hiba, Hnaa, Smah, and Amna for helping and supporting to final this research within the limited time frame.

Finally' Iwish to express thanks to my parents and all my family to support and encouragement along the way.

List of Abbreviation

CRF	Chronic Renal Failure
ELISA	Enzyme Linked Immune Assay
HBcAg	Hepatitis B core
HBeAg	Hepatitis B envelope Antigen
HBV	Hepatitis B Virus
HD	Hemodialysis
WHO	World Health Organization

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Abstract

Back ground:- HBV infection is very serious public health problem a among Chronic renal failure (CRF) patients with hemodialysis are at increased risk for transmission of Hepatitis B virus (HBV) infection. In dialysis environment, HBV transmits by transfusion of contaminated blood and blood product, exposure to contaminated equipment and contact with infected patients and health staff.

Aim: - this study aimed to determine of frequency of hepatitis B virus infection among renal failure patients at Aljemaih center - Dongola city

Method: - This is a cross-sectional observational study was conducted in Aljemaih center dialysis in Dongola city at northern of Sudan between (February – August 2018) . A total of 100 patients were identified. All patients were examined for hepatitis B surface antigen (HBsAg) using enzyme linked immunosorbent assay (ELISA).

Results: - Out of total of 100 hemodaylsis patients participated in this study. Male were 57(57%) and 43 (43%) were female. In this study, found that; Five (5%) of these patients tested positive for HBV infection, 3 (60%) were male and 2 (40%) were female (p.value =0.9 (p.value >0.05). All these patients infected with HBV after exposes to dialysis, the duration period of dialysis of four patients was half and one to three years while one of them three month.

Conclusion:- The frequency of HBV infection among renal failure under Although relatively low 'dialysis patients was found 5% positive prevalence of Hepatitis B virus some higher prevalence values induce for the implementation of stricter infection prevention measures and more effective follow up procedures.

الخلاصة

خلفية:-

عدوى فيروس الالتهاب الكبدي البائي هي مشكلة صحية عامة خطيرة للغاية بين مرضى الفشل الكلوي المزمن (CRF) خاصة المرضى الذين يعانون من غسيل الكلى الدموى , يذداد خطر انتقال العدوى بفيروس التهاب الكبد (HBV) بسبب البيئة التي يتم فيها غسيل الكلى ، ينتقل الفيروس عن طريق نقل الدم الملوث اومشتقات الدم ،اوالتعرض للمعدات الملوثة والتواصل مع المرضى المصابين والعاملين بالحقل الصحى

الهدف: - هدفت هذه الدراسة إلى تحديد مدى تكرار عدوى فيروس التهاب الكبد B لدى مرضى الفشل الكلوي في مركز الجميح - مدينة دنقلا

الطريقة: - تم إجراء دراسة استقصائية مستعرضة في مركز الجميح للغسيل الكلوي في مدينة دنقلا شمال السودان فى الفترة ما بين (فبراير - أغسطس 2018). تم فحص جميع المرضى بالمركز لمستضد التهاب الكبد البائي السطحية (HBsAg) باستخدام طريقة الاليزا (ELISA).

النتائج: شارك في هذه الدراسة.100 مريض كان عدد الذكور 57 (٪) و 43 (٪) من الإناث. ، وتم ايجاد خمسة 5 (٪) من هؤلاء المرضى مصابين بفيروس الالتهاب الكبدي البائي ، 3 ذكور 60 (٪) و 2 من الإناث 40(٪)، وكانت مدة فترة غسيل الكلى لاربعة مرضى سنة ونصف إلى ثلاث سنوات وواحد منهم فقط ثلاثة أشهر.

الاستنتاج: - تم العثور على عدوى فيروس التهاب الكبد البائي بين مرضي الفشل الكلوي تحت الغسيل الكلوي 5 ٪ إيجابية ، وعلى الرغم من انخفاض نسبة انتشار فيروس التهاب الكبد البائي نسبيا ولكن توجد بعض القيم مرتفعة مما يحثنا علي التوصية بتنفيذ تدابير الوقاية من الإصابة باستخدام اجراءات المتابعة بصرامة وفعالية اكثر

Chapter one

1.1Introduction

1.1Introduction:

The hepatitis B virus (HBV), discovered in 1966 infects more than 350 million people worldwide.(1) Hepatitis B is a leading cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma, accounting for 1 million deaths annually. The distribution of hepatitis B infection varies greatly throughout the world. In areas where the prevalence is high, such as Southeast Asia, China, and Africa, more than half the population is infected at some time in their lives, and more than 8 percent are chronic carriers of the virus, the result of either neonatal transmission (vertical) or transmission from one child to another (horizontal). Areas with low levels of endemicity include North America, Western Europe, and Australia, where only a minority of people come into contact with the virus, as a result of horizontal transmission among young adults. (2) The World Health Organization estimates that the number of HBV carriers will reach 400 million by the year 2000. The numbers will continue to increase until neonatal vaccination and immunization are universally accepted. Chronic HBV infection afflicts 1.25 million people in the United States. Of the 22,000 infants born each year to HBs Ag-positive mothers in the United States, more than 98 percent receive immunoprophylaxis (hyperimmune globulin and vaccine) and are protected from infection.(3) A vaccination programaimed at all newborn infants and adolescents is under way in this country.(4, 5) The hepatitis B virus (HBV) has a complex relationship to kidney diseases. Chronic HBV infection is an etiologic factor in secondary glomerular diseases. From an opposite perspective, the HBV carrier status has a critical impact on the clinical management of kidney transplant recipients and patients with renal diseases who are treated with

immunosuppressive drugs HBV is not directly cytopathic to hepatocytes. The host immune response, especially via virus-specific cytotoxic T lymphocytes, is the basis for hepatocellular damage as well as viral clearance. Neonatal exposure to HBV when the immune system is immature results in minimal acute hepatitis, but this is followed by chronic infection in 90% of subjects, and contributes to the bulk of chronic HBV carriers. After entering hepatocytes by endocytosis, the partially double-stranded viral genomic DNA is transported into the nucleus, where it is converted to covalently close circular DNA, which serves as a template for transcription of viral mRNAs, which in turn are used for viral replication through reverse transcription and the production of viral DNA polymerase and other viral proteins. Intrahepatic covalently closed circular DNA thus accounts for the persistence of infection. About 350 million people worldwide have chronic HBV infection. The importance of HBV in clinical nephrology increases markedly in areas with endemic infection such as South East Asia, where the proportion of chronic HBV carriers can exceed 10% in the general population. In this regard, data from a recent series that included 390 patients with membranous nephropathy showed that HBV was the underlying cause in 12% of patients (6). This article reviews the clinical and therapeutic aspects of HBV-related glomerulonephritis focusing on membranous nephropathy, kidney transplantation with HBsAg-positive donors, and the evolving management of hepatitis B in kidney transplant recipients.

1.2Rational

HBV is major cause of morbidity and mortality of renal failure patients. So the early diagnosis would help to reduce the infectious causes and also help in sorting the machine of HBV patients rather than other patients.

Objectives

1.3.1. General objective:-

To determine the frequencey of hepatitis B virus infection among renal failure patients at Aljemaih center - Dongola city.

1.3.2. Specific objectives:-

To detemine the hepatitis B virus among patients with renal faliureby using ELISA.

To identify the possible risk factor's associated with HBV among heamodialysis patients.

Chapter two

2. Literature Review

2.1 Back Ground:-

Chronic renal failure (CRF) patients with haemodialysis are at increased risk for transmission of Hepatitis B virus (HBV) infection. In dialysis environment, HBV transmits by transfusion of contaminated blood and blood product, exposure to contaminated equipment (7،8), and contact with infected patients and health staff (9). HBV infection is very serious public health problem. Worldwide, 2 billion people exposed to infection and 350 million with chronic HBV infection. The World Health Organization estimated that 500,000 to 1.2 million death occure each year due to HBV-related chronic liver disease (10,11).

HBV is a small double stranded circular DNA virus of about 3.2 kilo base (kb) pairs. HBV belongs to Hepadnaviridae family with exceptional similar features to retroviruses (12). Developing countries have a high prevalence of HBV infection (13,14) that explained by nonknowledge about the universal infection control procedures (15).

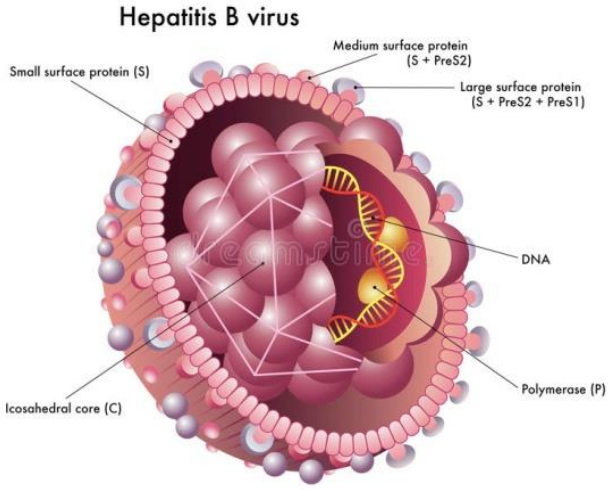

Figure 2.1. Hepatitis B virus

2.2. Pathogenic Mechanisms:

Both viral and host factors are involved in pathogenesis. An association with HLA genes has been reported, indicating the impact of genetic predisposition (16). The main pathogenic mechanism in HBV-related glomerular diseases is through the deposition of immune complexes in the glomerulus. The immune complexes are comprised of viral antigens and the antibodies that these antigens invoke from the host. Whether these immune complexes are formed in situ or are derived from circulating immune complexes being trapped in the glomerulus remains controversial. Various HBV antigens including hepatitis B surface antigen (HBsAg), hepatitis B early antigen (HBeAg), and hepatitis B core antigen (HBcAg) have been demonstrated in the glomeruli of patients with HBV-related glomerulonephritis,, and the detection of covalently closed circular DNA in renal tissue has also been reported (17). Immune deposition occurs predominantly in the subepithelial region but can also involve the mesangial and occasionally subendothelial areas, depending on the size of the antigens and immune complexes. It has been speculated that the low molecular weight of HBeAg (3×10^5 Da) might account for its ability to traverse the glomerular basement membrane and thus the formation of subepithelial immune deposits (18). The observed association between remission of proteinuria and clearance of HBeAg also provides indirect evidence that the antigen is involved in pathogenesis. The immune complexes then activate complements and glomerular injury occurs via the formation of membrane attack complex and other downstream events such as the induction of proteases, oxidation injury, and disruption of cytoskeleton (19, 20). Investigations on renal gene expression profile with microarrays, in transgenic mice that expressed HBsAg and HBcAg in the cytoplasm of renal tubular epithelial cells but without replication of the whole virus, have revealed upregulation of complement and coagulation pathways and acute phase

response genes, and reduced circulating C3 levels (21). HBV can be classified into eight major genotypes based on genome sequence divergence. The impact of viral genetics was recently investigated in a study that included two pediatric and four adult Japanese patients, five of whom had membranous nephropathy, and one with membrano proliferative glomerulonephritis (22). All the patients were HBeAg-positive and had high circulating HBV DNA levels. The investigators did not find any association between nephropathy and mutations in the HBV genome. However, the genotyping results were interesting. Previous studies showed that genotype C was predominant among local subjects with chronic hepatitis B, whereas genotype A accounted for only 1.7% (23). Yet complete viral genome sequencing showed that among the patients with nephropathy four had HBV genotype A1/A2, whereas two were infected with genotype C2. A high prevalence of genotype A in patients with HBV-related nephropathy had been reported by other investigators (24,25). Whether HBV genotype A may indeed be more likely to lead to renal manifestations compared with other genotypes, and the mechanisms accounting for such difference, require further investigations.

Risk factors for viral hepatitis, including hepatitis B virus. Substance abuse (injection drug use, snorting cocaine. High-risk sexual activities (eg, rectal intercourse. Multiple sexual partners. A sexual partner with viral hepatitis. Persons coming from or travelling to high-risk hepatitis endemic areas or exposure to a local outbreak… Household contact or sharing of personal items with an infected person. Attendance at daycares. Needle-stick injury or other occupational exposure (eg, nonimmune health care workers). Newborns of infected mothers. And Tattoos and/or body piercing using non sterile techniques ‹The virus is transmitted through contact with the blood or other body fluids of an infected person Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease.

2.3. Diagnosis:-

2.3.1. Specimen:-

The specimen of choice for the diagnosis of HBV infection is blood. Serological tests for viral antigens and antibodies are typically used for diagnostic screening and can be performed on either serum or plasma. Both HBV antigens and antibody are stable at room temperature for days, at 4°C for months, and frozen at -20°C to -70°C for many years. Because modern testing involves automated enzyme immunoassays that depend on colourimetic or chemiluminescence signal measurement, care should be taken to avoid hemolysis of the sample because it may interfere with the ability of the assay to accurately detect these markers.

The diagnosis of hepatitis B virus infection requires the evaluation of the patient's blood for hepatitis B surface antigen, hepatitis B surface antibody, and hepatitis B core antibody.

2.3.2 Interpretation of HBV Immunologic Markers (Table1)

HBs Ag	HBc Ag	HBs Ab	Interpretation
–	–	–	Susceptible HBV infection(should be vaccinated)
–	–	+	Immune because of vaccination
–	+	+	Immune because of natural HBV infection
+	+	–	Acute or chronic HBV infection

HBcAb = hepatitis B core antibody; HBsAb = hepatitis B surface antibody; HBsAg = hepatitis B surface antigen; HBV = hepatitis B virus; + = positive test result; – = negative test result.

- The presence of HBsAg indicates that the person is infectious.

- *HBcAb appears at the onset of acute HBV infection. Presence may also indicate chronic HBV infection or a false-positive test*.

- *The presence of HBsAb indicates recovery and immunity from HBV infection or successful immunization against HBV*.

2.3.3 Method of diagnosis:-

The most used to diagnosis is Elisa technique he is an immunological, plate-based assay designed for detecting and quantifying substances such as antibodies, antigens, proteins and glycoproteins in biological samples.

The principle of the techniqueELISA is typically performed in 96-well polystyrene plates, which passively bind antibodies or antigens.

The 96-well polystyrene plates allowing multiple samples to be measured in a single experiment.

The key step is immobilization of the antigen of interest to a solid surface.

Fortress HbsAg high sensitivity Elisa in vitro diagnostic kit for the detection hb surface antigen (HbsAg) in human serum or plasma the principle of the assay the test is an enzyme-assay based on (sandwich) polystyrene microliter strips well have been coated with monoclonal anti –HBs (antibody to HbsAg) patient serum sample is added to micro well during incubation1 hour the specific immuno complex formed then plates were washed with approximately 350ul of washing buffer then conjugate (fortress kit)was added and the plate incubated for 30 minutes .this allowed antigen in the sample to bind with the coat anti-Hbs conjugated to peroxidase in order to form antigen – antibody complex .the plates were washed again to remove unbound materials substrate added and colour developed in positive plates (control and positive samples) .the reaction was adding sulphuric acid .the colour was read as optical density in order to determine the result of the test.

2.3.4 Interpretation of result:-

The tests results were calculate by means of cut- off value determined with the followed formula.(C O) =Nc-2.1

Cut-off OD means of negative controls is lower than 0.05 and positive controls higher than 0.05

Treatment:-

HBV can be treated by antiviral drugs such as lamivudine, adefovir, and the immune system modulators interferon alpha-2a and interferon-α-2b and pegylated interferon alpha-2a and 2b. (26)

2.5. Prevention:-

The best way to prevent hepatitis B is by getting vaccinated. The hepatitis B vaccine is safe an effective. Completing the series of shots is needed for full protection. (27)

2.6. Previous study:-

Alkhan AA (2015) Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Infections among Hemodialysis Patients..Among all risk factors were studied, only the long duration of hemodialysis was significantly associated with HBV and HCV positivity, suggesting that HBV and HCV were nosocomial transmission and the nonadherence to the known universal infection control precautions could be contributing to the high prevalence. Education of staff members and adhere strictly to universal infection control precautions remains a cornerstone for prevention of hepatitis transmission among patients undergoing maintenance hemodialysis. (28).

In Sudan ’the epidemiology of hepatitis B virus (HBV) and hepatitis C virus (HCV) is important for health planners and service providers. A cross-sectional study was conducted by Hamada’ etal.(2011) to investigate the seroprevalence and associated risk factors for markers of HBV (HBsAg) and anti-HCV among hemodialysis patients at the Ahmed Gasim hemodialysis unit, Sudan. Of the 353 patients enrolled in the study, HBsAg and anti-HCV were detected in 16 (4.5%) and 30 (8.5%) patients, respectively. None of the patients were co-infected with HBV and HCV. Multivariate analysis showed that duration of dialysis was significantly associated with anti-HCV seropositivity [OR = 1.1, 95% CI = 1.2–1.3; P = 0.024]. No other

socio-demographic or clinical characteristics (age, sex, level of education, history of surgery, and number of units of blood transfused) were significantly associated with HBsAg or anti-HCV seropositivity. The results of this study suggest that HBsAg and anti-HCV have low prevalence among hemodialysis patients in Khartoum. Longer duration of dialysis was a risk factor for anti-HCV(29).

Chapter three

3. Material and Method:-

3.1. Study Design

This is a cross-sectional observational study.

3.2. Study Area

The study was conducted in Aljemaih center dialysis in Dongola city at northern of Sudan.

The target population was the renal failure patients under dialysis who attended in Aljemaih center at northern of Sudan.

3.3. Study duration

The study conducted between (February – Augest 2018).

3.4. Sample size

A total of 100 samples were collected from patients under dialysis during this period

3.5. Data Collection

The data was collected using questionnaire (**appendix 1)** to collect basic data about the participants (sex, age, marital status) .etc…. the second part covered risk factor for HBV infection and last part covered the result of HBV infection and take other information by staff like (duration of disease ، blood transfusion)..etc .The secondary data was collected from existing literature in the internet, books, journals and papers .

3.6. Sample collection and Size

The participants were selected using a random -sampling technique, from those who had practiced during the dialysis time. A total of 100 patients were identified as the desired suitable sample size.

Serum sample was used ELISA 3ml collected of venous blood in vacationer tube from each of the participants serum separated and kept at (4- 20C) until screening

3.5 Method

Diagnostic BXE 0742A storage at 2- 4C. 96 test for vitro diagnostic only. Fortress Enzyme – linked immunosorbent assay (ELISA) commercial kits fortress HbsAg high sensitivity ELISA in vitro diagnostic kits for the detection HB surface antigen (HbsAg) in human serum or plasma, the principle of the assay the test is an enzyme-assay based on (sandwich) polystyrenemicroliter strips well have been coated with monoclonal anti –HBs (antibody to HbsAg) patient serum sample is added to micro well during incubation the specific immune complex formed in case of presence of HbsAg in the sample is captured on the solid phase After washing to remove sample serum proteins. Second antibody conjugated to the enzyme HRP and directed against different epitope of HBsAg is added to the wells. During the second incubation step these HRP Conjugated antibodies will be bound to any anti-HBs –HbsAg complexes previously formed during the first incubation and the unbound HRP conjugate is then removed by washing. After washing to remove unbound HRP conjugate chromogens solutions containing TMB and urea peroxides are added to the wells .in presence of the antibody – antigen – antibody HRP sandwich immune complex formed .the colorless chromogens are hydrolyzed by the bound HRP conjugate to a blue colored product. the blue color turns yellow after stopping the reaction using the stop solution .the color intensity can be measured and it is proportional to the amount of antigen captured in the wells and to its amount in the sample respectively .wells containing samples negative for HBsAg remain colorless

3.6 Statistical analysis:-

The IBM SPSS Statistics version 21.0 software was used for data analysis. Numerical variables were presented as the mean ± standard deviation (SD), and frequencies were presented as numbers (N) and percentages (%). Differences between numerical variables were calculated by Student's t-test, and differences between nominal variables were calculated using the chi-square. The level of significance was set at $P \leq 0.05$

Chapter four

4. Result

Out of total of 100 hemodylsis patients participated in this study. male were 57(57%) and 43 (43%) were female. In this study, found that; Five (5%) of these patients tested positive for HBV infection, 3 (60%) were male and 2 (40%) were female (p.value =0.9 (p.value >0.05) (table 4.1). All these patients infected with HBV after exposes to dialysis, the duration period of dialysis of four patients was half and one to three years while one of them three month, were with frequency of dialysis "twice a weak". 95 patients (95%) were with frequency "thrith a week" and 5 patients (5%) (table 4.2) , All male patients were smoking before infected with renal failure while just seven (7%) patients continue smoking, and 6% alcoholic. The patient who dialysis in fixed machine 42(42%) most other no fixed machine (56%), who operate surgery (87%) while (13%) not. Almost patients received blood transfusion (91%), and the rest (9%) were not (table 4.4). All positive HBsAg patients were received blood transfusion five (100%) three of them at cohol intake(60%) 'and who fixed machine (100%)and five patients suergry operated (100%) p.value=0.975(9 (p.value >0.05) Result indicated insignificant . were with frequency age of positive HBsAg patient (1) (20%) patient in range(31- 45) years and(3) patients (60%)in range (46 – 61 years and (1) patients (20%) in range (62- 78) years (table 4.4) patient' who marriage is five (100%). All patients with HBVAg under this study are hypertensive after dialysis.

Table (4.1) frequency of HBsAg rate according to gender

sex	HBV result		Total
	positive	Negative	
Male	3	54	57
Female	2	41	43
Total	5	95	100

p.value =0.9 (p.value $>$0.05) Result indicated insignificant

Table(4.2) Frequancy of Number of dialysis patients

Numberof dialysis	Frequancy	Percent%
2 dialysis/ week	96	96.0
3 dialysis/week	4	4.0

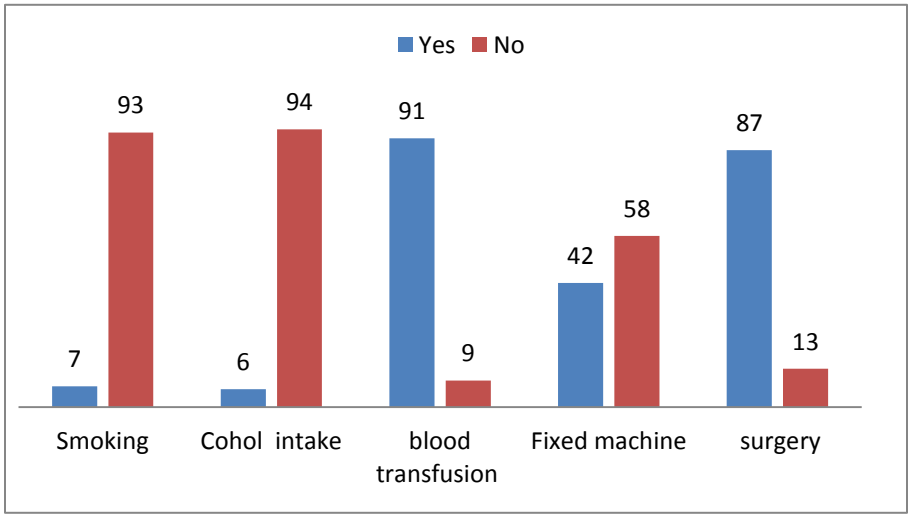

Figure (4.3) Risk factor of HBVinfection in hemodialysis patients

Table (4.4) frequency rate of HBsAg according to age group

Age(years)	Frequency total	Percnt %	ve+frequency	Percent %
15- 30	8	8	0	0
31- 45	17	17	1	20
46- 61	28	28	3	60
662- 78	40	40	1	20
79	7	7	0	0
Total	100	100	5	100

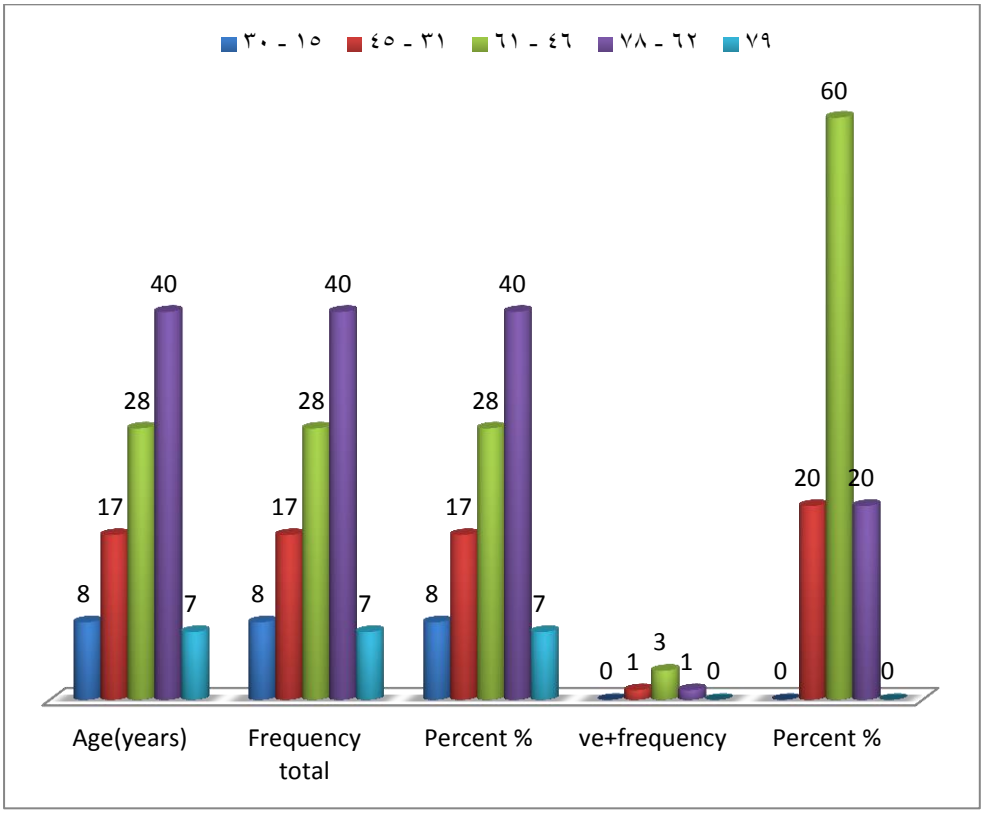

Figure (4.4) frequency rate of HBsAg according to age group

Table (4.5) Frequency of HBsAg positive according of risk factor

Risk factor	yes	No	total
Alcohol intake	3	2	5
	60%	40%	100%
Suergry operated	5	0	5
	100%	0%	100%
Blood transfusion	5	0	5
	100%	0%	100%
Smoking	3	2	5
	60%	40%	100%
Fixed machine	5	0	5
	100%	0%	100%

p.value=0.975(9 (p.value >0.05) Result indicated insignificant

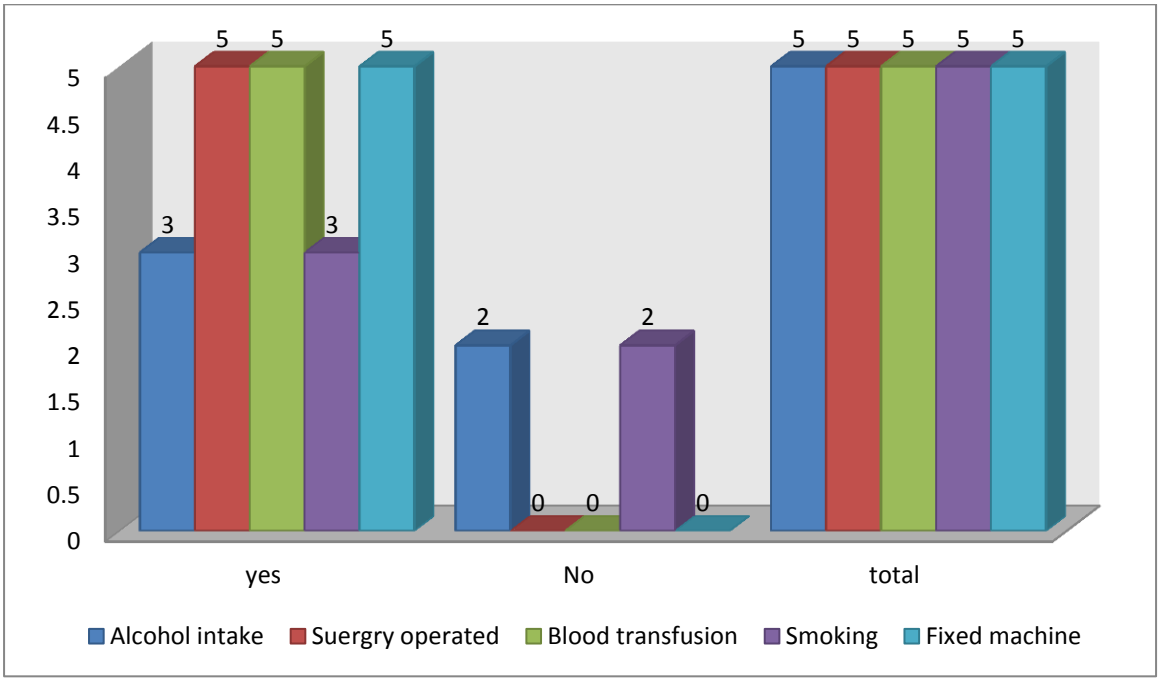

Figure (4.5) Frequency of HBsAg positive according of risk factor

5.1. DISSCUSSION

The frequency of HBV infection among renal failure under dialysis patients was found 5% positive، Patients are high risk group for exposure to hepatitis B viruses in dialysis units due to various reasons included; impairment of immune system, blood transfusions, using same machine and/or sharing the same room with infected patients, contact with infected health staff, disobeying universal rules and using immunosuppressive drugs، such high prevalence was observed by Gasim I et al (29,30).

Worldwide, many studies carried out to find prevalence of HBV in RF patients during dialysis process. In developing countries the prevalence is high as showed by studies done in Taiwan, the prevalence was (16.1%). In Pakistan showed 124 were hepatitis positive (prevalence at 10.2%). In Kenya was conducted in at Kenyatta national hospital, hepatitis B was found in 8 patients (8%). In India study by Christian medical college infrom the all patients who undergoing dialysis at the time of the study (29%) of them were hepatitis B positive, In developed countries, in Canada 1998 study done in Alberta and showed that infection in hemodialysis patients HBV were only (1.2%) (31).

Risk Factors of HBV Infections in Hemodialysis Patients The understanding of the risk of transmission of hepatitis B among hemodialysis patients is essential to undertake the appropriate measures to prevent its transmission. A number of risk factors are implicated including blood transfusion, duration of dialysis, dialysis machine sterilization and preparation and the use of common medication carts. Generally HBV were transmitted mainly through the haemodialysis environment ، but the role of transfusion could not be excluded ، this agree by M.Cendoroglo Neto et al (32).

Literature review from different articles showed some relation in HBV infection and variables such as frequency of dialysis in week, total number of dialysis and age .gender although these variables are contributing factors toward HB infection but our study shows there is no significant association between HB infection and our variables, this finding was in agreement with previous report in Iran by Eteadi J (33).

There are strong correlations between the age (46- 61) and theHBV infection among heamodialysis patients this is due to impairment of immune system.

The results have low prevalence among hemodialysis patients at Aljemaih hemodialysis center in dongola northern of Sudan. that is reverse to improve in health services and good quality control .

5.3. Conclusion

The frequency of HBV infection among renal failure under dialysis patients was found 5% positive ’Although relatively low prevalence of Heptitis B virus some higher prevalence values induce for the implementation of stricter infection prevention measures and more effective follow up procedures.

5.3. Recommendation

- Introduce training courses in infection control for all health care workers. Vaccinate all patients and staff against HBV.
- Clean and disinfect the dialysis stations (chairs, beds, tables, machines, (etc…) between patients.
- A dvice all patients under dialysis to take vaccine of HBV before dialysis.
- A wareness of useful early diagnosis for prevention of patient from HBV.

6.1Reference

1. Purcell RH. The discovery of the hepatitis viruses. Gastroenterology 1993;104:955-963

Web of Science

2. Kane M. Global programme for control of hepatitis B infection. Vaccine 1995;13:Suppl 1:S47-S49

Web of Science

Medline

3. Maternal hepatitis B screening practices -- California, Connecticut, Kansas, and United States, 1992-1993. MMWR Morb Mortal Wkly Rep 1994;43:311, 317-311, 320

4. Kim S C, Sinai L N, Casey R, Pinto-Martin J A. Universal hepatitis B immunization. *Pediatrics* 1995; 95:764-766

Web of Science

Medline

5. Update: recommendations to prevent hepatitis B virus transmission -- United States. JAMA 1995; 274:603-604

6. Zeng CH, Chen HM, Wang RS, et al. Etiology and clinical characteristics of membranous nephropathy in Chinese patients. *Am J Kidney Dis*. 2008; 52:691–698. doi: 10.1053/j.ajkd.2008.06.006. [PubMed] [Cross Ref]

7. WHO. Global surveillance and control of hepatitis C. Report of a WHO Consultation organized in collaboration with the Viral Hepatitis Prevention Board, Antwerp, Belgium. *Journal of Viral Hepatitis*. 1999; 6(1):35–4

8. Cendoroglo NM, Draibe SA, Silva AE, Ferraz ML, Granato C, Pereira CA, Sesso RC, Gaspar AM, Ajzen H. Incidence of and risk factors for hepatitis B virus and hepatitis C virus infection among haemodialysis and CAPD patients: Evidence for environmental transmission. Nephrology, Dialysis and Transplantation. 1995; 10 (2):240–246

9. Al Saran K, Sabry A, Al Halawany Z, Ismail M. Factors affecting response to hepatitis B vaccine among hemodialysis patients in a large Saudi hemodialysis center. Saudi Journal of Kidney Diseases Transplantation. 2014; 25 (1):185-191

10. Hepatitis B. Geneva, World Health Organization, (WHO Fact sheet, No. 204); 2008. Available:http://www.who.int/mediacentre/f actsheets/fs204/en/ index.html (Accessed 18 May 2009)

11. Lavanchy DJ. Hepatitis B virus epidemiology, disease burden, treatment, and current and emerging prevention and control measures of viral Hepatitis. 2004; (2):97–107.

12. Liang TJ. Hepatitis B: The virus and disease. Hepatology. 2009; 49 (5):13-21

13. Madhava V, Burgess C, Drucker E. Epidemiology of chronic hepatitis C virus infection in sub-Saharan Africa. *Lancet Infectious Diseases*. 2002; 2(5):293–302

14.Jobarteh M, Malfroy M, Peterson I, Jeng A, Sarge-Njie R, Alabi A, Peterson K, Cotten M, Hall A, Rowland-Jones S, Whittle H, Tedder R, Jaye A, Mendy M. Seroprevalence of hepatitis B and C virus in HIV-1 and HIV-2 infected Gambians. *Virology Journal*. 2010; 15(7):230

15. Telaku S, Fejza H, Elezi Y, Bicaj T. Hepatitis B and C in dialysis units in Kosova. *Virology Journal*. 2009; 4(6):72

16. Park MH, Song EY, Ahn C, *et al.* Two Subtypes of hepatitis B virus-associated glomerulonephritis are associated with different HLA-DR2 alleles in Koreans. Tissue

Antigens. 2003;62:505–511. doi: 10.1046/j.1399-0039.2003.00141.x. [PubMed] [Cross Ref]

17.L. Chen L, Wu C, Fan X, et al. Replication and infectivity of hepatitis B virus in HBV-related glomerulonephritis. Int J Infect Dis. 2009;13:394–398. doi: 10.1016/j.ijid.2008.08.014. [PubMed] [Cross Ref]

18. Takekoshi Y, Tochimaru H, Nagata Y, Itami N: Immunopathogenetic mechanisms of hepatitis B virus-related glomerulopathy. Kidney Int 1991, Suppl 35:S34–S39. [PubMed

19. Nangaku M, Couser MG. Mechanisms of immune-deposit formation and the mediation of immune renal injury. Clin Exp Nephrol. 2005;9:183–191. doi: 10.1007/s10157-005-0357-8. [PubMed] [Cross Ref]

20. Topham PS, Haydar SA, Kuphal R, et al. Complement-mediated injury reversibly disrupts glomerular epithelial cell actin microfilaments and focal adhesions. Kidney Int. 1999;55:1763–75. doi: 10.1046/j.1523-1755.1999.00407.x. [PubMed] [Cross Ref]

21. Ren J, Wang L, Chen Z, et al. Gene expression profile of transgenic mouse kidney reveals pathogenesis of hepatitis B virus associated nephropathy. J Med Virol. 2006;78:551–560. doi:

12.1002/jmv.20575. [PubMed] [Cross Ref]

22. Kusakabe A, Tanaka Y, Kurbanov F, et al. Virological features of hepatitis B virus-associated nephropathy in Japan. J Med Virol. 2007;79:1305–1311. doi: 10.1002/jmv.20941. [PubMed] [Cross Ref]

23. Orito E, Ichida T, Sakugawa H, et al. Geographic distribution of hepatitis B virus (HBV) genotype in patients with chronic HBV infection in Japan. Hepatology. 2001;34:590–594. doi:

1053/jhep.2001.27221. [PubMed] [Cross Ref]

24. Gilbert RD, Wiggelinkhuizen J. The clinical course of hepatitis B virus-associated nephropathy. Pediatr Nephrol. 1994;8:11–14. doi: 10.1007/BF00868249. [PubMed] [Cross Ref)

25. Bhimma R, Coovadia HM, Adhikari M. Hepatitis B virus-associated nephropathy in black South African children. Pediatr Nephrol. 1998;12:479–484. doi: 10.1007/s004670050492. [PubMed] [Cross Ref]

26. Awidi AS, Tarawneh MS, el-Khateeb M, Hijazi S, Shahrouri M (1984) Incidence of hepatitis B antigen among Jordanian volunteer blood donors. Public Health 98: 92-96.

27.Guidelineson hepatitis B and C testing February 2017 World health organization https://www.cdc.gov/

28. Alkhan AA (2015) Hepatitis B Virus (HBV) and Hepatitis C Virus (HCV) Infections among Hemodialysis Patients. General Med 3: 1000165. doi:10.4172/2327-5146.1000165

29. Epidemiology of hepatitis B and hepatitis C virus infections among hemodialysis patients in Khartoum, Sudan

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30. Vanholder R, Van Biesen W. Incidence of infectious morbidity and mortality in dialysis patients. Blood Purification. 2002; 20(5):477–480.

31. Alessandro A, Coppo R. Effect on the immune response; In Davison AM, Cameron JS, Grünfeld JP, Ponticelli C, Ritz E, Winearls CG, Ypersele C (eds)

32.M. Cendoroglo Neto S. A. Draibe A. E. B. Silva M. L. Ferraz C. Granato C. A. P. Pereira R. C. Sesso A. M. C. Gaspar H. Ajzen
Nephrology Dialysis Transplantation, Volume 10, Issue 2, 1 February 1995, Pages 240–246, https://doi.org/10.1093/ndt/10.2.240

33. Etemadi J, Somi MH, Ardalan MR, Hashemi SSR, Soltani GG, Shoja MAM. Prevalence and risk factors of hepatitis b infection among hemodialysis patients in Tabriz: A multicenter report. Saudi Journal of Kidney Diseases and Transplantation. 2012;23(3):609-613

6.2Appendex

Shandi University

Questionnaire Form

Date of enrolment:-

Record number ( ) Place of data collection: …….

Sex: Male ( ) Female ( )

Age: ( ) Years...

Number of dialysis: ……..…….....

Duration of dialysis: …….....

Duration of HBV infection.....

Occupation: …….....

Marital Status: Single ( ) , Married ( ).

Lifestyle:-

- Nutrition …….....

-Exercise …….....

-Income High ( ), Middle ( ), Low( )

-Smoking: No ( ) , Yes ( )

-Alcohol intake: No ( ), Yes ( )

-Blood pressure: High ( ), Normal ( ), Low ( )

Disease:-

-Infectious Disease: Jaundice ( ) , HIV ( )

HBV ( ), HCV ( ), -Chronic lung Disease: Tuberculosis ( ) ,

-Heart Disease: Hypertension ( ), ( )

-Other Disease: Allergy ( ), Anemia ( ), Diabetic ( ) , ( )

-Drugs use No( ) , Yes( ) type of drug……..….....

-Surgery and previous transfusions No( ) , Yes( )

-Did you received blood recently? No( ) , Yes( )

If yes last time of received …….

Did you dialysis in fixed machine?.....….....

Date of exposurewith HBv

Labdiagnosis:-

……

……

……

……

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Finalreport:

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