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HEPATITIS B VIRUS (HBV) AND HEPATITIS C VIRUS (HCV) INFECTIONS AMONG HEMODIALYSIS PATIENTS AT OMTH

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ABSTRACT

Objective: The aim of the study is to evaluate the prevalence of hepatitis B and C viruses in HD patients at Omdurman Military Teaching Hospitals(OMTH) in Sudan June 2015. To determine the risk factors of hepatitis B and C infection in hemodialysis patients. **Methods:** This is a cross sectional study which was carried out in Omdurman Military Hospital (OMTH) renal unit in Sudan In June 2015. The notes of patients on maintenance hemodialysis were reviewed and the patients were interviewed by the researchers to collect data regarding the serology status of these patients and potential risk factors which could be associated with hepatitis B virus and hepatitis C virus infection. **Results:** A total of 100 patients were included in this study. Fifty two (52%), were males were females (48) ,48% The prevalence of hepatitis B virus was 5%. The prevalence of hepatitis C virus was 6%. **Conclusion:** The results of this study showed that the prevalence of HBV and HCV infections in hemodialysis patients (HD) at Omdurman Military Teaching Hospitals is similar to other countries. Many actions is required to improve infection control measures in HD centers in Sudan.

KEYWORDS: Hemodialysis (HD), Hepatitis B virus, Hepatitis C virus, OMTH.

INTRODUCTION

Hepatitis B and hepatitis C viruses are major health problems worldwide. It is estimated that numbers of infected patient were 2 billion people worldwide, while it is a chronic disease in 15% of adult population. HCV is also a global health problem which affects about 200 million people worldwide, 3% of world population living with chronic hepatitis C, while about 3-4million people were infected every year, and about 350,000 people die every year due to HCV.[1]

Hemodialysis is the main renal replacement therapy in patients with end-stage kidney disease. This treatment modality carries high risk of transmitting blood born infection, such as hepatitis B virus, hepatitis C virus and human immunodeficiency virus to patients with chronic kidney disease.[2]

Those patients who were have ESRD and has many intercurrent problems such low low immunity, making them makes them much have lower response rate to hepatitis B vaccine.[3] Number of risk factors are implicated including blood transfusion, duration of dialysis, dialysis machine sterilization and preparation and the use of common medication carts. Studies conclude that the transmission of virus to anemic and repeated blood transfusion, and invasive procedures more than the general population which also put them at higher risk of being infected with these viruses.[4]

Therefore, patients undergoing hemodialysis are expected to have the highest rates of hepatitis B virus and hepatitis C virus infections and this is exactly what has been confirmed by the great majority of epidemiological studies which showed prevalence of hepatitis B and hepatitis C infections in hemodialysis units ranges from 1-20% and 1-55% respectively.[5,6,7]

The presence of hepatitis B virus and/or hepatitis C virus in patients with chronic kidney disease can also increase the morbidity and mortality in these patients. For example, the rate of rejection in kidney transplant and mortality are higher in patients with hepatitis C virus infection than patients without such infection.[8] Also, the response rate to antiviral treatment is decreased and the side effects of antiviral drugs are higher in chronic kidney disease patients.[9]

There are many risk factors which are associated with increased rates of blood born infections among hemodialysis patients. So, identifications of these risk

factors and introduction of measures to address these factors have become a priority in hemodialysis units.[10]

Previous studies of HBV and HCV epidemiology in Sudan showed different prevalence, from as high as 23% to as low as 0.6% for HCV and a wide range of HBV prevalence were reported (5.6 to 68%) (El-Amin et al., 2007; Elsheikh et al., 2007; McCarthy et al., 1989,[11,12,13] Emad-Aldin etal found that Hepatitis B surface anti gen (4.91%), anti-Hepatitis C virus antibodies, in (1.82%) respectively.[14]

There are few studies on the prevalence of HBV &HCV in hemodialysis patients in Sudan (Gasim etal 2011), found that the prevalence of HBsAg and anti-HCV were detected in 16 (4.5%) and 30 (8.5%) patients, respectively.[15]

MATERIALS AND METHODS

This was cross sectional descriptive study conducted at the Omdurman military teaching hospital (OMTH) renal unite during may –June, 2015. All the 100 patients who were on regular hemodialysis in the study period were enrolled. Ethical approval was obtained from the Ethical Research Committee, Karary University College of medical laboratory science and approval of the administration of Omdurman Military Teaching Hospital (renal unite).

After singing an informed consent, structured questionnaire was used to gather socio-demographic data (age, sex, education, residence, and employment from all patients. Blood (5 ml) was collected in plain tubes, allowed to clot, and centrifuged at room temperature. The sera were then tested immediately for HBs Ag and anti-HCV using ELISA kits.

The Axsym HBsAg version 2.0 kit (Abbott, N. Chicago, IL) was used to determine HBsAg levels. Nonreactive samples were considered negative for HBsAg and not tested further, while reactive samples were retested to confirm the result. Repeatedly reactive samples were considered positive and not tested further.

The Axsym HCV version 3.0 kit (Abbott) was used to measure anti-HCV antibody levels. Nonreactive samples were considered negative for HCV, whereas reactive samples were retested to confirm the result and repeatedly reactive samples were considered positive.

Statistical analysis was done using SPSS for Windows version 15. The difference between categorical variables was tested using Chi square test. The P value was considered significant when it is less than or equal to 0.05.

RESULTS

All patients were affected with kidney failure. Total 100 patients were attended the hem dialysis unit. Out of this 52 were males and 48 were females (52%,48%),with mean age of 50 years, most of the patients were lie between 40 and 60 years of age (43%) and 27% in patients lie between 20-40 years and 30% lie above 60 years.(Table 1)

The mean time duration on hemodialysis for all patients was (3,5 years), and most of the patients lie between 2-4 years (58%), all patients had history of blood transfusion, with mean 4-5 (unit) representing that 84% of the patients. Educational level of the patients was 30% illiterate,47% secondary 23% university .22% of patients are vaccinated with Hepatitis B vaccine, And none of vaccinated patients were consider is HBsAg positive .91% of patients were suffer from hypertension as main complication .No opporttunistic infections were found .

The overall prevalence of positive HBV Ag was %5 (5 patients) ,Fig(2)Where as Anti-HCV was detected in 6% (6 patients) Fig(1) . None of patients had dual infection with both HBV and HCV.

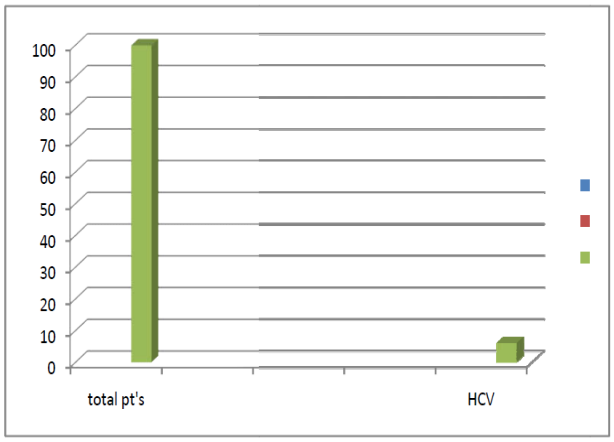

Fig.1. prevalence rate off HCV in HD unite among 100 samples

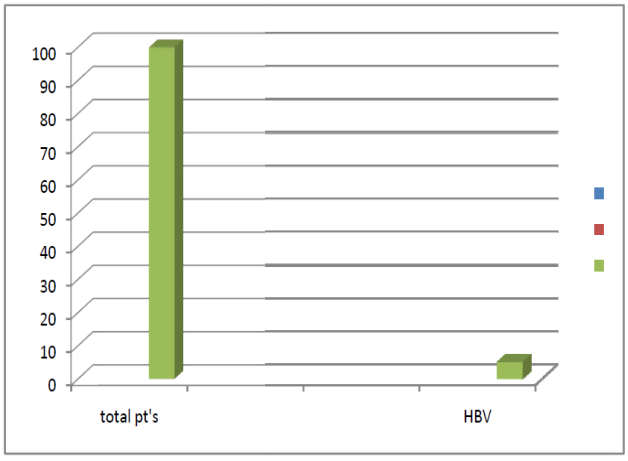

Fig.2. prevalence rate of HBV in HD unite among 100 sammples

Table(1).

Sex	Female 48%	Mal52%	Total (100)
Age	20-40	27%	
	40-60	43%	
	60-80	30 %	
Dialysis Duration	1/12-2years. 2-4 years. 4-8years. >8years	26% 58% 15% 1%	
HBV vaccines	Yes(22%)	NO(78)%	
History for blood transfusion	Yes(84)%	No(16)%	
hypertension	Yes(91)%	No(9)%	

DISCUSSION

This study revealed that the prevalence of hepatitis B infection in HD patients in OMTH is, 5% which is comparable to previous studies done by Gasim2011 (4.5%),[15] while it is within normal range of prevalence of HBsAg in general population (HBsAg ranging 6.9 %[16] to 18.7%.[17] The prevalence of HBV infection within dialysis units in developing countries appears higher (20%) based on several studies. The overall prevalence of HBV in HD patients in Gaza strip was (8.1%), Jordan (5.9%), Saudi Arabia (10%), Bahrain (11.8%) and Yemen (48.83%)[18]-[19] [20].[21] On the other hand the prevalence of hepatitis B in HD patients in western countries like UK and USA is below 1% which is much lower than our result.[22] In addition, the appearance of serological markers for HBV may be delayed by as long as 6 - 12 months . In our study, vaccination against hepatitis B is one of the most protective factors in preventing hepatitis B transmission among hem dialysis patients ,although it is found in small numbers ,but it is promising in country like Sudan, In addition vaccination will prevent hepatitis B virus to dialysis staff. Hence, the current guidelines recommend hepatitis B vaccination for all patients who would receive maintenance hemodialysis and for all the staff of dialysis unit.[23]

The prevalence of anti-HCV antibodies in patients receiving HD is 6%in our study, it is slightly lower than study done by Gasim 2011, (8.5%).[15] While it is comparable to prevalence of anti-HCV in the general population in Sudan (2.2%[24] to 4.8 %.[25] Globally the prevalence of HCV among patients receiving HD varies from as low as 6.1% in Germany[26] to as high as 76% in Casablanca.[27] Previous studies from the region have reported a prevalence of anti-HCV antibodies in HD patients of 50% in Saudi Arabia[28], 42% in Tunisia[29], 20.2% in Turkey[30] and 21% in Jordan (16.5%,[31] There are many factors concerning hepatitis C such as nosocomial transmission of hepatitis C among hemodialysis patients and horizontal infection from patient to patient through the dialysis units staff themselves when there is a break in infection control procedures. Another controversial proposed route of hepatitis C is the dialysis machine itself where some studies proved its importance, while other studies negotiate against its role in hepatitis C transmission. Most international guidelines still do not recommend dialyzing hepatitis C infected patients on isolated machines.

This study has several limitations: it is a cross sectional study that was carried at one time point; there was no indication of the sequence of events so the cause effect relationship could not be ascertained and the number of patients was relatively small to generalize our results. Hence, more representative studies are needed to confirm our results

CONCLUSION

The prevalence of hepatitis B & Hepatitis C in hemodialysis patient is almost similar to that of general population and vaccination against hepatitis B was strongly protective against infection..

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