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Research Article

Serofrequencyof Hepatitis E Virus among Hemodialysis Patients in Omdurman Military Hospital Khartoum-State

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ABSTRACT

A total of 90 participants (45 hemodialysis patients as case and 45 healthyindividuals ascontrol group) who attending medical checkup in Military hospital during the period fromMarch to April 2015, were enrolled in this study. Their age ranged from (25 — 55) years with 40 years mean .The aim of this study was to detectHepatitis E virus IgG antibodies among patients and control group, and to detect the relation between seropositivily and to correlate between seropositivily and age, duration of dialysis.

90 serum specimens were collected and analyzed by ELISAtechnique.

The results showed that 8(8.9%), 5(5.6%) were positive for IgG antibodyamong patients and control respectively, and 37 (41.1%), 40(44.4%) were negative for IgG patient and control respectively, of the total, 13(14.4%) werepositive and 77(85.6%) was negative.

Statistical analysis showed that there was insignificant correlation between age, durationof dialysis, and present of HEV IgG.

Large-scale studies in different settings and studies in Sudan are required.

Keywords: Serofrequency, HEV,IgG- Hemodialysis -ELISA-Khartoum-Sudan.

INTRODUCTION

Hepatitis E is a self-limiting acute hepatitis caused by hepatitis E virus (HEV), which can occur both in sporadic or epidemics forms [(1)].In term of clinical symptoms, hepatitis E cannot be differentiated from other viral hepatitis cases. The spectrum of symptom range from asymptomatic to fulminate disease, most patients suffer from jaundice, pain, abdominal tenderness, nausea, vomiting, and fever. Hepatitis E does not become chronic and often show no recurrence. The most important complication is a sever fulminate and fetal hepatitis in pregnant women and people with chronic liver disease [(2)]. A large outbreak of Hepatitis E was reported in June 2004 in the internally displaced population camps of Darfur [(3)]. The infection represents an important public health concern in many developing countries, where it is often responsible for epidemics out breaks [(3).] The infection effects primarily young adults and is generally mild; however the mortality rate is higher among women especially in second and third

trimester of pregnancy. In Sudan the fatality ratio of 17.8% was found in an outbreak in Darfur [3].

Hepatitis E virus (HEV) is spherical, non-enveloped; single stranded of positive-sense RNA virus [4] that belongs to the new genus, Herpesvirus of the family Hepeviridae[5]. Patient on dialysis are highly susceptible to infection because they often are immunocompromised are exposed routinely to invasive technique and devices. This pathogen is responsible for at least 50% of acute none A non B hepatitis in developing countries. HEV infection is a major cause of human viral disease with clinical and pathological feature of acute hepatitis; in related study Takehiro, reportedprevalence rate of anti-HEV IgG (9.4%) [6].

Most studies addressing risk factor for HEV in non-endemic area come from developed area such as North America and Europe. In this study they evaluated seroprevalence for HEV in 88 patient on dialysis in argentina. They found a significantly higher serprevalence of HEV IgG in thoseundergroing dialysis compared with health controls

(10.2% and 4.3% respectively, p = 0.03).[7]

This study aimed to detect Serofrequency of hepatitis E virus among hemodialysis patients.

MATERIALS AND METHODS

This was descriptive- cross sectional study which had been conducted in Omdurman military hospitalduring period April to June 2015,45 patients as case and 45 healthy individuals ascontrol wereenrolled, Data was collected by using direct interviewing questionnaire,and ethical clearance was obtained from Research Ethical Committee of faculty of Graduate Studies and Ministry of Health Khartoum State.

EXPERIMENTAL WORK

Collection of Specimens:

Blood specimens were collected from 90 participants,under direct medical supervision by medial vein puncture using 5 mlsyringe into plain tube to obtain serum by centrifugation at 5000 rpm for 10 min. serum was kept in -20°C till serological study was performed.

Specimens were processed by Enzyme linked immune sorbent assay (ELISA) (3rd generation ELISA) (Weka- China) fordetectionof IgG

Enzyme linked immune sorbent assay for detection anti Hepatitis E virus IgG.

All reagents and samples were allowed to reach roomtemperature for 15minutes before use.

Washing buffer was prepared 1:9 from buffer concentrate with distilled water.

Patient's specimens were diluted 1:101 in sample buffer.

One hundred (100µl)of the calibrator,positive and negative controls or diluted patient sample were pipetted into the individual microplate wells ,then plate was covered and incubated for 30 minutes at (25ºc)Plate was taken out and wash buffer was added to each microplate wells(Washing 1) and aspirated off after 20 seconds. This step was repeated for 3 times until each well become dry.

One hundred (100µl) of HRP-Conjugate Reagent was added in to eachmicro plate wells, the plate was mixed well and covered with the plate cover and incubated for 30 min at (25ºc).

The plate cover was removed and discarded. The liquid was aspirated and each well was rinsed in wash buffer (Washing2) and aspirated off after 20 second. This step was repeated for 3 times until each well become dry.

One hundred (100µ) of substrate solution was added in to each wells and mixed by tapping the plate gently. The plate was incubated at (25ºc) for 15 min.

One hundred (100µl) Stop solution was pipetted and added into each micro platewas shackedwells and mixed gently.

Photometric measurement of the color intensity was made at wavelength of 450 nm within 30 min of adding stop solution. Prior to measuring slightly shake the micro plate to ensure a homogeneous distribution of the solution.

The results can be evaluated by calculating a ratio of the extinction value of the control or patient sample over extinction value of calibrator 3. Calculated the ratio according to the following formula:

$$\frac{Extinction\ of\ control\ or\ patient\ sample}{Extinction\ of\ calibrator\ 3} = \text{Ratio}$$

Interpretation of Results:

Ratio<0.8: negative
Ratio>0.8 to 1.1: borderline
Ratio >1.1: positive

Data analysis: Data was analyzed by SPSS (StatisticalPackage of Social Science) software program version 16

RESULTS

A total of 90 participants(45 healthy individual as control and 45 hemodialysis patients as case) were enrolled in this study.

The result revealed thatsero-positivity ofhepatitis Evirus IgG of control and patientswere shown on (Table 1), The sero-positivity of case was 8(8.9%),

and control 5 (5.6) ,(p-valueinsignificant 0.3).
The study population age ranged from 25-55 years with 40 years mean (Table 2),most ofsero-positivity was observed among case group 8(17.8%), and control 5 (11.1%),(p-valueinsignificant(0.3). And the duration of hemodialysis patient were shown on (Table 3)most of sero-positivity of them in 3years and more than 3years 4(8.9%) (P-valueinsignificant (0.5). Statisticalanalysis showed that there was insignificant correlation (P-value more than 0.05) between age,duration of dialysis and presence of hepatitis E virus IgG.

DISCUSSION

HEV infection is major cause of human viral disease of acute hepatitis; this study presented the most recent data on the Serofrequency of hepatitis E virus IgG in the hemodialysis patients in terms of gender, age groups, and duration of dialysis.
The present study results revealed that 8(17.8%), were positive among patients for IgG, whencompared with others finding,in Iran it was similar study results revealed that (19.2%), were seropositive. Seropositive patients were not significantly different from seronegative patients, with regard to age, sex, duration and frequency of hemodialysis.agreed with their result in insignificant Similar study was reported the duration of dialysis (p = 0.87), and age (p =0.3)[8].
patients on dialysis are highly susceptible to infection because they often are immunocompromised are exposed routinely to invasive technice and devices .The possibility that HEV might be transmitted during dialysis , underscores the necessity for dialysis facilitates to strictly adhere to proper infection control at all time and must be all blood line attachment to the dialysis machine were disposable and discard after each dialysis session .Unfortunately HEV vaccine have not been mass produced and are not available for public use[9].

CONCLUSION

Prevalence of HEV seromarkers for previous and currentinfection is high. Facilities for routine diagnosis andvaccination are lacking. Initiation of organized screening andvaccination programs is limited by lack of vaccine. Werecommend the patient who started dialysis in the previous year may be how more exposed to the risk of infection.

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Table 1
Serofrequency of HEV among hemodialysis(n=45) and control group (n=45)

Anti HEV	Result		Total (%)
	Positive no (%)	Negative no (%)	
Patients group	8(8.9%)	37(41.1%)	45 (50%)
Healthy group	5(5.6%)	40(44.4%)	45 (50%)
total	13(14.4%)	77(85.6%)	90 (100%)

(P-value insignificant 0.3)

Table 2
Serofrequency of HEV according to age among hemodialysis (n=45) and control group (n=45)

Age groups in years	Result				Total
	Hemodialysis patients		Healthy individuals		
	Seropositive of patient no (%)	Negative of patient no (%)	Seropositive of control no (%)	Negative of control no (%)	
25-35	2(4.4%)	10(22.2%)	3(6.7%)	35(77.8%)	50
36-45	5(11.1%)	18(39.9%)	1(2.2%)	1(2.2%)	25
46-55	1(2.2%)	9(20%)	1(2.2%)	4(8.9%)	15
Total	8(17.8%)	37(82.2%)	5(11.1%)	40(88.9%)	90

Table 3
Serofrequency of HEV among hemodialysis patient (n=45) according to duration of dialysis

Duration of Renal hemodialysis	Result		Total
	Seropositive of patient no (%)	Negative of patient no (%)	
1-2 year	0(0%)	4(8.9%)	4
3 years	4(8.9%)	19(42.2%)	23
More than 3 years	4(8.9%)	14(31.1%)	18
Total	8(17.8%)	37(82.2%)	45

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