

Incidence of Hepatitis E Virus Among Elevated Liver Enzyme (Alt, Ast) Sudanese Patients, Khartoum, Sudan

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Abstract

Background: Hepatitis E Virus (HEV) infection is a newly recognized serious threat to global public health and Africa is suspected to be among the most severely affected regions in the world.

Objective: This study aimed to detect the frequency of anti-hepatitis E IgM, among elevated liver enzyme patients.

Methods: The current study is descriptive cross-sectional study carried out between April to August 2016, Ninety Patients with high liver enzyme ALT&AST and non B non C hepatitis attended Ibn senaa hospital Khartoum north, Omdurman teaching hospital and bahri teaching hospital bahri north, Sudan were collected and tested by using (ELISA).

Results: It shows that out of the 90 samples tested in order to evaluate the effect of age on HEV seropositivity, there was a significant difference ($P < 0.05$) between HEV seropositivity and age group.

Conclusion: Study demonstrates the high prevalence rate of HEV seropositivity among non-hepatitis patients with high level enzyme ALT, AST. This will raise the potential risk of HEV infection by blood transfusion and may be the source of the outbreak.

Keywords: Anti-HEV IgM; Hepatitis E virus; Alanine Amino Transferase; Aspartate Ammino Transferase

Introduction

Hepatitis E is a liver disease caused by the hepatitis E virus, a non-enveloped, positive-sense, single-stranded ribonucleic acid (RNA) virus. Hepatitis E should therefore be considered a risk to transfusion safety, especially in high-risk recipients (pregnant females, patients with pre-existing chronic liver disease, and immunocompromised patients), for two reasons. Firstly, the HEV-positive donor may have asymptomatic viraemia with normal aspartate transaminase and ALT and secondly; the time of seroconversion is not clearly defined [1-3]. Viraemia in individuals infected with HEV is usually of short duration but there are reported instances of protracted viraemia such as after acute HEV hepatitis in children [4]. A brief incubation period can be followed by asymptomatic phase although the infection in the recipient is generally asymptomatic apart from mild jaundice and elevated ALT. Elevated ALT and AST levels are associated with a recent acute HEV infection this provided a unique opportunity to diagnose asymptomatic and symptomatic HEV infection in an occupationally exposed group [5]. The presence

of seropositive anti-HEV and increased levels of ALT and AST usually indicate recent HEV infection and may signify a recent introduction of HEV [6].

Materials and Methods

The current study is descriptive cross-sectional study carried out between April to August 2016, Ninety Patients with high liver enzyme ALT&AST and non B non C hepatitis attended Ibn senaa hospital Khartoum north, Omdurman teaching hospital and bahri teaching hospital bahri north, Sudan were recruited in this study this study was approved by Alzaiem Alazhari University, Ethics was approved by the Ministry of Health Medical Specialization Ethics Review Board, Sudan. The blood specimens were collected by vein puncture in sterile plain containers for serological analysis samples were centrifuged, and sera were collected immediately. Sera were stored at -20°C till processed and tested by (ELISA) the presence of anti-HEV IgM antibody was considered as evidence for new exposure.

Statistics

Data were entered in to the computer using SPSS and doubled checked before analysis. Significance of differences was determined using the chi-square test. Statistical significance was set at P values < 0.05.

Results

Frequency of HEV IgM among elevated liver enzyme ALT, AST. Out of the 90, samples tested 34 subjects (37.7%) were HEV IgM positive, while 56 subjects (62.2%) were negative for HEV IgM (Table 1).

Influence of gender on HEV IgM seropositivity elevated liver enzyme ALT, AST:

The result presented in table demonstrates that there was no significant difference (P>0.05) between males and females (Table 2).

Influence of age on HEV IgG seropositivity among elevated liver enzyme ALT, AST.

The age range of the patients was from 20-29 was 5(35.8%) positive, 9(64.2) negative, from 30-39 was 4 (20%) positive 16(80%) negative, from 40-49 was 21was 11(34.4%) positive, 21 (65.6%), from 50 and above was 20 (83.3%) positive 4 (16,7%) negative, there was significant difference (P< 0.05) between HEV seropositivity and age group (Table 3).

Influence of residence on HEV IgM seropositivity among elevated liver enzyme ALT, AST: The results presented in (table 4) demonstrate that there was significant difference (P< 0.05)

between the residence in rural and urban and HEV IgM seropositivity (Table 4)

Table 1: Frequency of HEV IgM among elevated liver enzyme ALT, AST

Valid	Frequency	Percent
Negative	56	62.2%
Positive	34	37.7%

Table 2: Influence of gender on HEV IgM seropositivity elevated liver enzyme ALT, AST:

Age	negative	Positive	total
20-29	9(64.2%)	5(35.8%)	14
30-39	16(80%)	4(20%)	20
40-49	21(65.6%)	11(34.4%)	32
50 and above	4(16.7%)	20(83.3%)	24
Total	50	40	90

Table 3: Influence of age on HEV IgM seropositivity among elevated liver enzyme ALT, AST.

Gender	N and p	Negative	Positive	total
Male	Number	27	27	54
	percent	30%	30%	60.0%
Female	Number	23	13	36
	Percent	25%	14.4	40.0
Total	Number	50	40	90
	Percent	55%	44.4%	100.0%

Table 3: Influence of residence on HEV IgM seropositivity among elevated liver enzyme ALT, AST.

Residence	N and P	negative	positive	Total
Rural	Number	33	9	42
	Percent	36.7	10.0%	53.3%
Urban	Number	17	31	48
	Percent	18.9%	34.4%	46.7%
Total	Number	50	40	90
	Percent	55.6%	44.4%	100%

Discussion

Type E hepatitis is one of the important hygienic infectious problems of developing countries as like as other oral-fecal transmitted infections and the development of serological methods provided useful clinical and epidemiological information about this infection [7-8].

We studied the anti-HEV seropositivity in a group of non-hepatitis B non-C patients with high liver enzyme and noticed a prevalence of 37.7%, which correlates with the prevalence of endemic areas. The obtained value is higher than those obtained. The overall prevalence of anti-HEV IgM antibody among our study, which is higher than those reported by Johargy et al (2009) in Makkah, Saudi Arabia (18.7%)(55) , Gotanda et al

in Japan 2007 among voluntary blood donors with an elevated alanine aminotransferase (ALT) level, Japanese Red Cross Blood Center was (7.1%), (54) Aminiafshar 2004 was (7%) (60) Also higher than that reported by Adjei in accra gana 2010 (15.5%) (56), Lauren in blood transfusion Center of Suez Canal University Hospital, 2010 was (20.9%) (57) Ahmed et al 2015 was (26%) (59). Growing evidence suggest that elevated ALT and AST levels are associated with recent acute HEV infection (26-30). Similar results were obtained in our study and thus provided a unique opportunity to diagnose asymptomatic and symptomatic HEV infection. The presence of seropositive IgM anti-HEV and increased levels of ALT and AST usually indicate recent HEV infection (26) and may signify recent introduction of HEV. Seroprevalence in Sudan was lower than countries of the Eastern Mediterranean Region where reports of up to 52% seroprevalence for anti-HEV have been reported (27).

We noticed no sex association of anti-HEV seropositivity which correlates with other studies that similar to that found by Ahmed et al 2015(59). Adjei 2010(58).

In the current study, seroprevalence of anti-HEV IgM increased with age, (35.8%) in subjects from 20-29 years to (83.3%) in subject more than 50 years, that was similar with Johargy et al (2009) (55), adjei et al 2010 (58), Ahmed et al (2015) (59). Aminiafsha et al (2004) (60) Christensen (2003) which stated that older age was higher HEV seroprevalence rates. Other studies have found older age to be a risk factor for anti-HEV positivity (22, 29). It is probable that this represents cumulative exposure over time.

In terms of area of residence, (34.4%) %of the patients who lived in the urban area were positive for IgM antibody to HEV while (10.0%) were positive in those who lived in rural are ($P=0.00$). This similar to Ahmed et al (2009) (60). but disagree with Mansury et al (2011) in South West Franc (3). Which stated that the prevalence rate was more in rural as compared to that in the urban subjects, these results indicate that the populations with higher density may be at greater risk of hepatitis E.

Conclusion

This study demonstrates the high prevalence rate of HEV seropositivity among non-hepatitis patients with high level enzyme ALT, AST. This will raise the potential risk of HEV infection by blood transfusion and may be source of outbreak. Importance of evaluating HEV screening for blood donors to avoid the transmission of HEV to the patients and the high prevalence of HEV infection coupled with the elevated ALT and AST values suggest that HEV infection should be treated as an occupational illness and therefore suggest the urgent need for the introduction of some of the range of effective preventive strategies to improve settings in the community [9-16].

Ethical Approval

This study was approved by ministry of health medical specialization Ethics Review Board, Sudan.

Consent For Publication

Authors are revised and agreed for publish.

Data Availability

The data supporting this review are from previously reported studies which have been cited.

Competing Of Interest

The authors declare that they have no competing of interests.

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Authors Contributions:

Myada Haroon: design of the study, data collection and analysis drafting of the article, Amira Osman: supervising and final approval for publication.

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