

## Serofrequency of Hepatitis E Virus among Pregnant Ladies Attending Aboguta Hospital, Alhassahisa Provence, Aljazeera State, Sudan

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### Abstract:

*Background: Hepatitis EVirus (HEV) causes large – scale epidemics of acute viral Hepatitis. Particularly in developing countries with high Mortality rate with pregnant women. The infection is more severe, often leading to fulminate hepatic failure and death in a significant proportion of patients.*

*Methods: 90 pregnant ladies were enrolled done to detect the frequency of anti-HEV IgG during March to May 2015, by using Enzyme linked immunoassay (ELISA).*

*Results: HEVIgG antibodies were detected in 20%, of the total. The high percentages were recorded in second and third trimesters of pregnancies (25---30) age range.*

*Conclusion: This study found a high frequency of anti-HEV IgG among Sudanese pregnant women in Aboguta city.*

**Key words:** Anti HEV, ELISA, Hepatitis E virus, pregnant women, Aboguta, Sudan.

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## **Introduction:**

Hepatitis E virus causes sporadic infection but also large epidemics usually associated with fecal contamination of water<sup>(1,2)</sup>. A large outbreak of Hepatitis E was reported in June 2004 in the internally displaced population camps of Darfur. The infection represents an important public health concern in many developing countries, where it is often responsible for epidemics out breaks<sup>(3)</sup>.

The infection effects pregnant 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<sup>(3)</sup>.

Hepatitis E Virus is spherical, non-enveloped; single stranded RNA virus<sup>(4)</sup> that belongs to the new genus, Hepevirus. This pathogen is responsible for at least 50% of acute non 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 Takehiroet *al*, reported prevalence rate of anti – HEV IgG (9.4%)<sup>(5)</sup>.

HEV infection can be diagnosed by either detection of viral particle in stool using electron microscopy or detection of anti – HEV antibodies in serum. Similar to Hepatitis A virus, HEV occurs in high concentration in stool in the weeks immediately prior to the onsets of symptoms. Viral shedding in the stool usually continues about two weeks after onsets of jaundice, although in a few persons viral shedding has persisted as long as four weeks. Antibodies of HEV are detectable in nearly all infected patients upon presentation of their illness, initial symptoms included jaundice, fever, anorexia, hepatomegaly and gastrointestinal pain<sup>(6)</sup>.

Infection with HEV caused acute viral hepatitis in 60% of included women. Fulminant hepatic failure was more common and maternal mortality was grater in HEV infected women than in none HEV infected women<sup>(7)</sup>.

Severe forms of HEV are known to be more pronounced in pregnant women. Even though most of the described cases of acute hepatic failure associated to HEV during pregnancy had a favorable clinical course, some cases of fulminant liver failure and death are described. It is unknown whether liver transplant outcomes in this setting are different from other causes of acute liver failure. To our knowledge, this is the first case report in Portugal from a pregnant woman who developed hepatic failure due to fulminant hepatitis E that underwent successful liver transplantation<sup>(8)</sup>.

This study aimed to detect Serofrequency of Hepatitis E Virus among Pregnant Ladies Attending Aboguta hospital, Alhassahisa Provence, Aljazeera State, Sudan.

## **Material and Methods:**

### **Design:**

The current descriptive, cross – sectional study carried out between March to May 2015. A total of 90 pregnant ladies who attending Aboguta hospital, Al Hassahisa Provence, Aljazeera State, Sudan were enrolled in this study.

This study was approved by AL- Neelain University ethical Committee board and an informed consent was obtained from each pregnant lady before collecting the demographic and clinical data.

## **Experimental work:-**

### **Collection of Specimens and Processing:**

Five ml of blood was collected under aseptic technique into plain container. The sera obtained after centrifugation were kept at  $-20^{\circ}\text{C}$  until IgG antibodies were qualified by using EIISAKit (Euroimmune, Germany).

All reagents were brought to room temperature before assaying. 100 ul of calibrators, positive and negative controls or diluted patient samples into the individual micro plate wells, according to the pipetting protocol. Incubated for 30 minutes at room temperature( $25^{\circ}\text{C}$ ).

Reagent wells were washed 3 times with 450 ul of working strength wash buffer.

The wash buffer was left in each well for 60 second per washing cycle, then empty the wells. After washing thoroughly all liquid was disposed from the micro plate by tapping it on absorbent paper with the openings facing down words to remove all residual wash buffer.

100 ul of enzyme conjugate was pipetted (peroxidase – labeled anti –human IgG into each of the micro plate wells. Incubate for 30 minutes at room temperature( $25^{\circ}\text{C}$ ).

Empty the wells. Wash as describe above.

100 ul of chromogen/ substrate solution was pipetted into each of the microplate wells. Incubate for 15 minutes at room temperature (protected from direct sun light).

100 ul of stop solution was pipetted into each of the micro plate wells in the same order and at the same speed as the chromogen / substrate solution was introduced.

### **Measurement:**

The absorbance of specimens was measured with photometers at 450 nm within 30 minutes of adding the stop solution.

## **Calculation and Interpretation of Results:**

The result calculated by cut-off value. The cut-off value is determined by adding the mean absorbance for the negative control value (NC) multiplied by 0.5.

$$\text{Cut-off value} = 0.5\text{NC} + 0.5.$$

The presence or absorbance of anti – HEV is determined by comparing the absorbance of the unknown samples to that of the cut-off value. The unknown samples with absorbance values less than or equal to the cut-off value should be considered reactive for anti-HEV. The unknown samples with absorbance values greater than the cut-off value should be considered non – reactive.

## **Data analysis:**

The generated data were analyzed by using Master sheet and statistical package for social science (SPSS) program. The seropositivity of anti-HEV (IgG), and it it's relation to other factors (trimester, residence, age, education, blood transfusion, abortion, gravidity).

Were demonstrated by chi-square test and statistical significant relationship was obtained by p-value ( $P \leq 0.05$ ).

## **Results:**

A total of 90 pregnant ladies, who attending Aboguta Hospital, Aljazeera State, Sudan, during March to May 2015, were enrolled in his study.

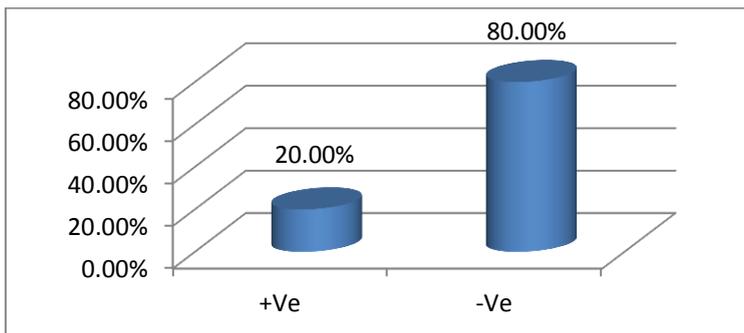
Their age ranged between 15 to 25 years with the mean 20 (table 1). Among the total studied pregnant ladies (20.0%) were seropositive to HEV, Highest seropositivity was observed among ladies in (25-30) years age (table 1), second and third trimesters.

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Statistical analysis showed significant relation between seropositivity of HEV and gestations of pregnancy.

**Table (1): Serofrequency of Hepatitis E among pregnant ladies (n=90) in relation to their age**

Age range			Result IgG		Total
			+Ve	-Ve	
new age	15--->20	Count	4	22	26
		% within Result IgG	22.2%	30.6%	28.9%
		% of Total	4.4%	24.4%	28.9%
	20--->25	Count	4	19	23
		% within Result IgG	22.2%	26.4%	25.6%
		% of Total	4.4%	21.1%	25.6%
	25--->30	Count	6	18	24
		% within Result IgG	33.3%	25.0%	26.7%
		% of Total	6.7%	20.0%	26.7%
	30--->35	Count	2	9	11
		% within Result IgG	11.1%	12.5%	12.2%
		% of Total	2.2%	10.0%	12.2%
	35--->40	Count	1	4	5
		% within Result IgG	5.6%	5.6%	5.6%
		% of Total	1.1%	4.4%	5.6%
	more than 40	Count	1	0	1
		% within Result IgG	5.6%	.0%	1.1%
		% of Total	1.1%	.0%	1.1%
Total		Count	18	72	90
		% within Result IgG	100.0%	100.0%	100.0%
		% of Total	20.0%	80.0%	100.0%



**Fig 1: Serofrequency of Hepatitis E among pregnant ladies (n=90)**

## **Discussions:**

Hepatitis E virus (HEV) infection during pregnancy leads to severe complications which may result in fetal and / or maternal mortality, abortion, premature delivery, or death of a live – born baby soon after birth.

Several researches have made and reported different results in various countries associated with HEV among pregnant ladies. This study aimed to detect serofrequency of HEV among pregnant ladies.

The overall, seropositive of HEV IgG were 20% of HEV antibodies among pregnant ladies, suggesting the possibility of subclinical infections. It found higher than that it found in Darfur and less than in western- Sudan (17.8% ), and lower than in Egypt ( 84.3%) and India (60%)(8,9) 2014.

Until now no epidemic cases of HEV infection have been reported in Aboguta, Aljazeera State, Sudan despite the high prevalence of IgG antibodies to this Virus. Furthermore, no signs and symptoms compatible with acute viral hepatitis were found that would indicate past HEV infection among these pregnant ladies. Probably the initial HEV infection occurred early in life, and, as with early childhood exposure to hepatitis A Virus in countries somewhere endemic, the children do not become ill. Therefore, epidemiological studies of people in various age groups and in children are also needed.

The interaction of hepatitis E and pregnancy is fascinating and has provided new insights into the pathophysiology and understanding of the immunology and host susceptibility factors and their interaction to produce the diseases processes. The severe liver injury due to HEV infection during pregnancy may be related to several possible factors, such as differences in immune and hormonal factors occurring during pregnancy, a genetic and environmental factors with its occurrence developing countries<sup>(10)</sup>.

### **Conclusion:**

This study found a high frequency of anti-HEV IgG among Sudanese pregnant women in Aboguta city.

### **Acknowledgement:**

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