

Seroprevalence of Hepatitis E infection among Pregnant Women in Damascus, Syria

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ABSTRACT

Hepatitis E virus (HEV) usually causes self-limited illness in general people, but it may be more rigorous in pregnant women and causes a high ratio of fatality in this population. Besides, hepatitis E virus infection in pregnancy is associated with fetal death, preterm delivery, and Complications in the mother (such as eclampsia, hemorrhage, and fulminant hepatic failure). The purpose of this study was to estimate the prevalence of HEV IgG antibodies among the pregnant women in Damascus, Syria and to make a comparison with that in other countries. A total number of 90 pregnant women were enrolled in this prospective cross-sectional study, consisting of women age ranging from 16 to 42 years at various trimesters of pregnancy. ELISA technique was used to measure the anti-HEV specific IgG. We found that 98.9% of pregnant women was seronegative, and one pregnant women (1.1%) had a positive result for anti-HEV IgG. In conclusion, this study showed that the seroprevalence of specific HEV IgG antibodies is low in the population of pregnant women in, and exhibited an influence of geographic differences between countries in the transmission of hepatitis E virus.

KEY WORDS: hepatitis E virus, pregnancy, Seroprevalence, Syria.

1. INTRODUCTION

Hepatitis E virus (HEV) infection is a significant common health problem in developing countries (Teshale, 2010). It is responsible for more than 50% of acute viral hepatitis in some developing countries (Perez-Gracia, 2015). The major routes of hepatitis E infection for spread are Fecal-oral, waterborne, Foodborne, and zoonotic transmission (Hoofnagle, 2012).

The HEV is a small non-enveloped, single-stranded icosahedral virus that belongs to the family Hepeviridae (Blut, 2009). While HEV usually causes self-limited illness in general people, it is more rigorous in pregnant women (Marano, 2015). The mortality rate among pregnant women who evolve the disease may be as high as 15–20% (World Health Organization, 2014). The etiologies of the more rigorous presentation in pregnancy unknown, though immunological and hormonal parameters may play a role (Navaneethan, 2008). However, most people who evolve symptomatic hepatitis E will make an ordinary convalescence and will have acquired natural immunity lasting through life to further episodes of this disease (Pratt, 2013). Recent studies support the concept of the existence of three additional pathways of HEV transmission: blood-borne transmission, person to person, and perinatal transmission (vertical transmission from mother to her child) (Mirazo, 2014). Hepatitis E virus infection in pregnancy is associated with fetal death, preterm delivery, and Complications in the mother (such as eclampsia, hemorrhage, and fulminant hepatic failure) (Shalimar, 2013; Aggarwal & Krawczynski, 2000). Diagnosis of human HEV infection is carried out by several laboratory tests, which include serological assays for identification of specific HEV antibodies of IgM and/or IgG class and molecular and immune electron microscopy techniques for detection of virus in serum or stool (Aggarwal & Krawczynski, 2000). The prevalence of seropositivity to hepatitis E virus infection in pregnant women, in Syria, has not been previously studied. The aim, therefore, of this study was to investigate the seroprevalence of specific HEV IgG antibodies among a population of pregnant women in Damascus, Syria, and to compare the results to those of other countries.

2. MATERIALS AND METHODS

Study duration and population: the study was conducted between November 2016 and December 2016 at the University Obstetric Hospital Damascus, Syria. After an informed consent was obtained from the participants, a total number of 90 pregnant women ranging in age 16 to 42 years at various trimesters of pregnancy were included in this study. The women were divided into the following age groups: 16-<20 years, 20-<30 years, and 30-42 years.

Sampling: a sample of 5 ml of blood was gathered from each subject and after centrifugation, 1 ml serum sample was Stored at -80° C until testing.

Methods: the serum samples were tested for the presence of anti-HEV specific IgG, using a commercial ELISA kit (BIOKIT; bioelisa HEV IgG, Spain) according to the manufacturer's instructions. Bioelisa HEV IgG utilizes recombinant HEV antigens from the structural region of the viral genome to detect the presence of HEV antibodies. The assay was performed in Damascus University Blood Center.

Statistical Analyses: To analyze the data, the statistical package for social sciences (SPSS, version 13.0) was used.

3. RESULTS

Among the 90 pregnant women tested, only 1 (1.1%) were seropositive for HEV IgG antibody. The remaining 89 (98.9 %) were negative and therefore susceptible to HEV infection.

Our study comprised eight pregnant women at the first trimester, 25 pregnant women at second trimester, and 57 pregnant women at third trimester. In general, 34 cases had a history of miscarriage in their previous pregnancies. The only one HEV seropositive case was reported an abortion in her previous pregnancy. The comparison of age groups, History of jaundice, place of residency, and previous miscarriage between the two seropositive and seronegative groups was illustrated in Table.1.

Table.1. Characteristics of Participants in the Two Seropositive and Seronegative Groups.

Characteristics	HEV Seropositive, n = 1	HEV Seronegative, n = 89
Age group		
16-<20 years	0	12
20-<30 years	0	46
30-42 years	1	31
place of residence		
Urban area	0	43
Rural area	1	46
History of jaundice		
Yes	0	6
No	1	83
Previous miscarriage		
Yes	1	34
No	0	55

DISCUSSION

The seroprevalence of specific IgG antibodies to hepatitis E virus in pregnant women in Syria has not been investigated previously. Other countries in the Middle East have reported a seroprevalence of IgG in pregnant women of 4%-84% (Yazbek, 2016). In other countries such as china, Spain, and Brazil, the prevalence was found to be 16.2%, 3.6% and 1% respectively (Cong, 2015; Lindemann, 2010; Trinta, 2001).

In our study seropositivity to anti-HEV specific IgG was found in 1.1%, which is a low rate similar to other studies in other parts of the world. in a study in Brazil, Trinta revealed that the seroprevalence of HEV IgG in pregnant women was 1% (Trinta, 2001).a study in Iran, 3.6% were reported (Khameneh, 2013). Also, several studies in developed countries, such as Spain (3.6%) (Lindemann, 2010), French (7.7%) (Renou C, 2014), and United States (4.9%) (Ditah, 2014); on the other hand, the prevalence of anti-HEV specific IgG is significantly higher in Africa (range 12-30% central Africa to 84.3% Nile Delta of Egypt) (Hannachi, 2011; Stoszek, 2006), and South Asia (nearly 30%) (Begum, 2009).This differences in rates could be interpreted due to the environment differences between the different countries.

4. CONCLUSION

This study has identified for the first time the seroprevalence of hepatitis E virus in the population of pregnant women in Damascus, Syria, and it shows that the seroprevalence of specific HEV IgG antibodies is low in the pregnant women population in, which reveals Similarity with the rates informed from developed countries.

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