

Sero-prevalence of Hepatitis B virus and Hepatitis C virus among pregnant women in Baghdad

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Abstract

Objective (s): The study aimed to investigate the sero-prevalence of hepatitis B virus (HBV) and hepatitis C virus (HCV) among pregnant women in Baghdad.

Methodology: During the study period, sera were collected from 321 pregnant women, and they were tested for markers of hepatitis B virus antigen (HBVsAg) and hepatitis C virus antibody (Anti-HCV) by using ELISA technique.

Results: HBsAg was detected in 18 (5.6%), Anti-HCV was detected in 1 (0.3%) out of 321 women. More cases HBsAg positive in age group > 40 years. Significant difference between infectious of hepatitis B and history of blood transfusion, jaundice and home delivery. But no significant difference with parity, surgical operation and dental manipulation.

Recommendation: All pregnant women should be tested for HBV and HCV as standard routine test. And other studies are urgently need to investigate HCV and HIV co-infections and their vertical transmission. Other viruses (Hepatitis E) should be investigated.

Key words: Prevalence, Pregnancy, Hepatitis B, Hepatitis C.

Introduction:

Hepatitis B virus (HBV) infection affects over 350 million people worldwide and over one million die annually of HBV related chronic liver disease. In endemic areas, most individuals are infected by vertical transmission, or in the early childhood ^[1]. Hepatitis in pregnancy has been observed in patient with HBV has a high rate of vertical transmission, causing fetal and neonatal hepatitis. Additionally, mother-to-child transmission of HBV infection predisposes to carriage, liver cirrhosis, and hepatocellular carcinoma in young adults. Thus acute hepatitis B in pregnancy presents risks not only for the mother but also for their newborn ^[2].

Hepatitis C virus (HCV) infection is a major worldwide public health problem. The world health organization (WHO) estimates that 3% of the world population are chronically infected with HCV, most of these cases occur in Africa, which is

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reported to have the highest HCV prevalence rate^[3]. Since selective screening of pregnant women for HBV has failed to identify a high proportion of HBV-infected mothers. Pre-natal HBsAg testing of all pregnant women is now recommended. Universal HBsAg screening of pregnant women to prevent perinatal HBV infection has been shown to be cost saving^[4].

The current study aimed to investigate the prevalence and the possible risk factor for hepatitis B and C virus among pregnant women in Baghdad.

Methodology:

At the attending general gynecological obstetric, family planning in AL-Elwiya, Baghdad teaching hospital and primary Health center services in Bab-Almudhum. All pregnant females who attended the antenatal clinic from June 2010 to June 2011 for the first time-before 38 weeks of gestation-constituted the subjects of the present study.

Every pregnant women was routinely tested in each pregnancy. Serology screening for HBsAg and anti-HCV is requested in every first booking visit.

After an informed consent all pregnant women attended the first antenatal care visit were approached to participate in the study. A fixed questionnaire was applied together relevant socio-demographic characteristic of these women (age, education, gestational age and parity). Then the possible risk factors (history of blood transfusion, jaundice, surgical operation, home delivery and dental manipulation) for HBV and HCV were inquired for.

After immediate centrifugation the sera were tested for HBsAg status was determined by using ELISA test (Bio kit/ Finland) and antibodies to HCV using ELISA anti-HCV test kit (Bio kit) samples repeatedly reactive for HBsAg or anti-HCV were considered positive for HBV or HCV infection respectively.

Statistics: the data were entered in computer and analysis by spss for window. The means, percentage were calculated and compared between the sero-positive and sero-negative (hepatitis) using chi-square test. Multiple regression was used, sero-positive for HBVsAg as dependent variable and the parity, education, and other possible risk factors as independent variables. $P > 0.05$ was considered significant^[5].

Results:

General characteristics of the women.

During the study period 321 women were enrolled at 27.2 weeks of gestational age. The mean (SD) age was $28(\pm 6.3)$ years. The mean (SD) of parity was $2.4(\pm 1.2)$, 79 (25%) of them were primigravidae. 307 (96%) of these women had less than secondary level education. 78 (24%), 68 (21%) women gave history of blood transfusion and jaundice, respectively. 60 (19%) and 29 (9%) had history of surgical operation and home delivery, respectively. While 70 (22%) had history of dental maneuvers.

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Among the 321 pregnant women, 18 (5.6%) positive for HBsAg during pregnancy and 0.3% (1/321) positive for anti-HCV, see table (1).

Table (1): Distribution pregnant womens according to the type of hepatitis test (HBVsAg and Anti-HCV).

Pregnant women	HBsAg (%)	Anti-HCV (%)
Positive	18 (5.6)	1 (0.3)
Negative	303 (94.4)	320 (99.7)
total	321 (100)	321 (100)

When pregnant womens based age, were divided in 4 groups (<20, 20-30, 31-40, >40 years old), see table (2).

Sero-positive HBsAg among those aged >40 years was ten time, it was among people <30. Mean while, people aged 31-40 are three time more-likely to be positive for HBsAg as compared to those <30 years.

One the other hand, the number of sero-negative cases to be hepatitis B was significantly higher among the youth compared with the elderly, it was increased from 19% (61/321) among those below 20 years to 5% (16/321) among those aged >40 years. (P<0.001)

One (1.2%) case positive for Anti-HCV, compared with 8 (9%) cases positive for HBsAg in the same age group (31-40 years).

Table (2): Distribution of HBsAg and Anti-HCV according to age group for pregnant womens.

Age group	No. of pregnant women	HBsAg positive (%)		Anti-HCV positive (%)	
		Positive (%)	Negative (%)	Positive (%)	Negative (%)
<20	61	0 (0)	61 (100)	0 (0)	61 (100)
20-30	153	4 (2.6)	149 (97.4)	0 (0)	153 (100)
31-40	85	8 (9)	77 (91)	1 (1.2)	84 (98.8)
>40	22	6 (27)	16 (73)	0 (0)	22 (100)
Total	321	18 (5.6)	303 (94.4)	1 (0.3)	320 (99.7)

The statistical analysis showed no significant difference between parity and infectious of hepatitis B (HBsAg) P=0.153 as shown in table (3).

Table (3) Distribution of HBVsAg according to the parity for pregnant womens.

Parity	HBsAg positive (%)		Total (%)
	Positive	Negative	
Primigravidae	6 (34)	73 (24)	79 (25%)
>More one	12 (66)	230 (76)	242 (75%)
Total	18 (100)	303 (100)	321 (100)

$\chi^2 = 2.045, df=1, p=0.153$

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But significant difference ($p < 0.001$) between infectious HBsAg and the level of education. 72% (13/18) positive for HBsAg in less than secondary school education, compared with 28% (5/18) more than secondary school education (table 4).

Table (4): distribution of HBs-Ag according to the level education for pregnant women.

Education	HBsAg positive (%)		Total (%)
	Positive	Negative	
>secondary school	5 (28)	9 (3)	14 (4)
<secondary school	13 (72)	294 (97)	307 (96)
Total	18 (100)	303 (100)	321 (100)

$\chi^2 = 25.075$, $df=1$, $p=0.001$

Table (5), showing results analysis of some possible risk factors. History of blood transfusion, jaundice and home delivery, 11(14%), 13(19%) and 5(17%) respectively, the statistical analysis showed significant difference with infectious of HBsAg, ($p < 0.006$, $p < 0.001$ and $p < 0.001$) respectively. While no significant difference between history of surgical operation ($p=0.479$) and dental manipulation ($p=0.022$) with infectious of HBsAg, 2(3%), 6(9%) respectively.

Table (5): Distribution of HBsAg according to the history of some possible risk factors.

History	HBsAg		Total (%)	χ^2 , df, P-value
	Positive (%)	Negative (%)		
Blood transfusion	11 (14)	67 (86)	78 (100)	7.697, 1, <0.006
Jaundice	13 (19)	55 (81)	68 (100)	13.981, 1, <0.001
Surgical operation	2 (3)	58 (97)	60 (100)	0.500, 1, 0.479
Home delivery	5 (17)	24 (83)	29 (100)	16.296, 1, <0.001
Dental manipulation	6 (9)	64 (91)	70 (100)	5.261, 1, <0.022

None of the expected risk factors (parity, education, history of blood transfusion, jaundice, home delivery, surgical operation and dental manipulation) had been found to be associated with Anti-HCV sero-positive, one (0.3%) out of these was found to be positive.

Discussion:

In the western world, morbidity and mortality of hepatitis B virus infection primarily results from chronic infection which occurs at highest risk (90%) with infections acquired perinatally or early in the postnatal period. In contrast, intra-uterine infections are rare. Therefore, screening of pregnant women for positive

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HBsAg followed by appropriate immunization of infants, if needed is crucial to avoid hepatitis B virus transfusion.^[6] Perhaps, this is the first published study documenting sero-prevalence of HBV and HCV among pregnant Sudanese women. Around 5% and less than one percent of these women had been found to be positive for HBsAg and HCV respectively.^[7,8]

The present study shows that the sero-prevalence of HBsAg was 5.6%, which is comparable to the >2.6% reported in pregnant Saudi women by AL-Mazrou and colleagues^[9] and far less than the reported by AL-Shamahy in the study conducted in Yemen^[10] and by Hazmi^[11], and by AL-Rowaily et al.^[4] In Iraq studies. Hamim^[12] in Thi-Qar city 2006-2010 year, it was detected antigen HBsAg (56.68%) and (23.53%) anti-HCV, ($p < 0.001$) among blood donors.

Hussein^[13] in Sulaimani city in the years 2006 and 2007 among blood donors in major blood bank 0.48% HBV infection in 2006 and changed significantly in the next year to 0.25%, ($p < 0.05$). The overall sero prevalence of HCV among donors was 0.11% and not changed significantly in the next year, ($p > 0.05$). However, comparison between this study and the other's should be taken cautiously. Firstly, different methods had been applied, in this study it was aimed to detect antigen (HBsAg) and antibodies (Anti-HCV) using ELISA, while some of these studies, DNA of these viruses had been detected rather than antigen and/or antibodies. Secondly, the differences in socio-demographic background of these women have to be remembered. Thirdly the difference in prevalence and interactions of HBV and HCV might explain the result.

The geographical influence of high endemicity in neighboring sub-Saharan countries might change the current situation in the future. Furthermore, even inside Sudan higher prevalence of HBV and HCV had been reported among non-pregnant population of the southern and central Sudan.^[3]

Acute hepatitis B in pregnancy is not associated with increased abortion rate, still birth or congenital malformation. However, prematurity seems to be increased if hepatitis is acquired in the last trimester.^[14] Finally, HBV infection does not appear to be teratogenic. However, there appears to be a higher incidence of low birth weight among infants born to mothers with acute HBV infection during pregnancy.^[2]

Vertical transmission of HBV is the main cause of chronic HBV infection in endemic areas. When the mother is a chronic HBsAg carrier (with serum positive for viral DNA), the risk of the neonate becoming a chronic carrier is close to 80-9%.^[15]

On the contrary, if the mother's serum is negative for viral DNA, the transmission rate is about 10-30% only.^[16] There are three possible routes of transmission of hepatitis virus from infected mothers to infants; transplacental transmission in the uterus (antenatal transmission), transmission during delivery, and postnatal transmission from mothers to infants during child care or through

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breast feeding. [2] The baby usually first encounters the hepatitis virus upon entering the birth canal. However, several reports demonstrate that in the case of HBV infection uterine infection too plays an important role. [17] Besides, most researchers believe that the mechanism of intrauterine HBV infection is transplacental infection. In fact, it has been suggested that transplacental leakage of HBeAg positive maternal blood, which is induced by uterine contractions during pregnancy and the infection. [18]

Maternal-infantile transmission was low with combined immunization, in which the pregnant women receive HBIG injection during pregnancy and their new borns get HBIG and hepatitis B vaccine after birth. This is agreement with another study, which suggested that up to 95% of maternal-infantile transmission can be blocked by using mother and baby combined immunization. [19, 20]

Finally, knowing the frequency of chronic HBV infection in pregnant women is important in order to protect the infant from risk of HBV infection.

Recommendation:

- All pregnant womens should be tested for HBsAg. However, HCV test might be significant for pregnant women under risk.
- Other studies are urgently need to investigate HCV and HIV. Co-infections and their vertical transmission. Other viruses like hepatitis E should be investigated among the whole population as well as in pregnant women.

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معدل انتشار التهاب الكبد الفيروسي نوع B و التهاب الكبد الفيروسي نوع C عند النساء الحوامل في بغداد

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المستخلص

الهدف: الدراسة تهدف للتحري عن معدل انتشار التهاب الكبد الفيروسي نوع (B) ونوع (C) عند النساء الحوامل في بغداد.

المنهجية: خلال فترة الدراسة، جمعت 321 نموذج لمصل دم من نساء حوامل وتم الكشف عن المستضدات النوعية لالتهاب الكبد الفيروسي نوع (B) بأختبار HBsAg والأضداد النوعية لالتهاب الكبد الفيروسي نوع (C) بأختبار Anti-HCV وذلك بأستخدام تقنية الروز المناعي المرتبط بالأنظيم. **النتائج:** تم الكشف عن 18 حالة موجبة لالتهاب الكبد الفيروسي نوع (B) وبنسبة 5.6% في حين وجدت حالة واحدة موجبة لالتهاب الكبد الفيروسي نوع (C) وبنسبة 0.3% عند 321 امرأة حامل. واعطيت اعلى نسبة اصابة للكبد الفيروسي (B) عند الفئة العمرية اكثر من 40 سنة في حين وجد الفرق المعنوي واضح بين الأصابة بالتهاب الكبد الفيروسي نوع (B) والتاريخ السابق لنقل الدم وكذلك اليرقان وحالات الولادات المنزلية السابقة، بينما لم يكن هناك اي فرق معنوي بين الأصابة وعدد الولادات السابقة او التاريخ السابق للعمليات الجراحية ومراس الأسنان.

التوصيات: نوصي بأجراء فحص روتيني لكل النساء الحوامل خاص بالتهاب الكبد الفيروسي (B) و(C) والحاجة الى اجراء بحوث جديدة حول الأصابة بالتهاب الكبد الفيروسي نوع (C) وفايروس نقص المناعة المكتسبة وايضاً التهاب الكبد الفيروسي نوع (E).