

Prevalence of Hepatitis B and C Virus Infection among Pregnant Women in Sharkia Governorate, Egypt

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Key words: HBV,
HCV, pregnancy.

Background and study aim: Viral infections is the cause of liver inflammation, cirrhosis and even liver hepatocellular carcinoma (HCC). Despite the availability of HBV vaccine and antiviral treatment for HBV and HCV both remain a major health problem. The aim of this study To determine the seroprevalence of HBV and HCV infection among pregnant women in Sharkia governorate, Egypt.

Subject and Methods: : is a cross-sectional study, It involved 563pregnant women attending the antenatal care clinic, all women are subjected to full history taking, clinical examination, laboratory

investigations, detection of HBsAb, HCV antibodies by rapid one-step test then by ELISA if positive, PCR was done.

Results: In this study, 10 cases had anti-HCV positive with ELISA, 8 cases were positive by PCR while one case was positive for HBs Ag by ELISA, no co-infected pregnant women were detected. the prevalence rate of HBV&HCV was 0.17%, 1.7 % respectively.

Conclusion: All pregnant women should be routinely screened during an early antenatal visit for HCV Antibodies and HBsAg. Cases with HCV antibodies positivity should be subjected to PCR for HCV RNA.

INTRODUCTION

Viral hepatitis is one of Egypt's most significant public health challenges, with an estimated 8–10 million persons, or 10% of the population, living with the disease and millions more at risk for infection [1].

The estimated national prevalence of HCV infection among those aged 15–59years was 7% in the national survey in 2015 [2]. However, the population prevalence rate of HBV was 1.4% in 2017 [3,4].

During pregnancy, viral hepatitis is closely linked to high risk of maternal complications, with potential vertical transmission that leads to fetal and neonatal hepatitis [5].

The antenatal screening of women for hepatitis B surface antigen and HCV antibodies can therefore provide a reliable prevalence of the disease in pregnant women and provide an avenue to prevent the fetal

transmission of the virus from mother. This study aimed at detecting the prevalence of HBV& HCV among pregnant women in Sharkia governorate, Egypt.

SUBJECTS AND METHODS

This hospital based cross sectional study, it involved 563pregnant women attending the antenatal care clinic in Obstetric &Gynecological department, Zagazig university hospital, Zagazig, Egypt, in the period from May 2017 to May 2019.

Inclusion criteria:

All adult pregnant women attending the antenatal care clinic during the study offered to participate.

Exclusion criteria:

All women with the following criteria were excluded:

- Women with non viral liver affection.
- Women refusing to sign consent.

All patients were subjected to:

- 1- Full history taking with symptom questionnaire and full clinical examination
- 2- Abdominal ultrasound

***Laboratory investigation:**

1-Routine investigations including CBC, RBS, liver function test, PT (concentration/ INR), PTT.

2-Detection of HBsAg:

- Rapid test for HBsAg was carried out using a rapid diagnostic kits, Finger stick test according to manufacturer instruction for the qualitative detection of Hepatitis B Surface Antigen (HBsAg) in serum (ABON HBsAg, (AbonBiopharm, ABON Biopharm (Hangzhou) Co. Ltd. China)
- Positive samples were tested for the presence of HBV by ELISA. (Bio elisa HBsAg 3.0).
- Positive HBsAg by ELISA were confirmed by PCR using HBV DNA Quantification Kit v1 (Bosphore®).

3-Detection of HCV:

- Rapid test for HCV antibodies was carried out using a rapid diagnostic kits Fingerstick test according to manufacturer instruction for the qualitative detection of antibodies to Hepatitis C Virus in the serum (ABON HCV(ABON Biopharm (Hangzhou) Co. Ltd. China).
- Positive HCV patient by rapid test kit was tested using ELISA kit (Bio elisa HCV 4.0).
- Positive HCV antibodies ELISA were confirmed by PCR using HCV RNA Quantification Kit v1 (Bosphore®).

Statistical Analysis:

All data were collected, tabulated and statistically analyzed using SPSS 22.0 for windows (SPSS Inc., Chicago, IL, USA). Continuous Quantitative variables were expressed as the mean \pm SD & median (range), and categorical qualitative variables were expressed as absolute frequencies "number"& relative frequencies (percentage). Categorical data were compared using the Chi-square (χ^2) test or Fisher's exact test when appropriate. All

tests were two sided. $p < 0.05$ was considered statistically significant (S).

RESULTS

This study included 563 pregnant women receiving antenatal care. For whom full history taking, clinical examination, laboratory investigations including HBsAg and HCV antibody was done.

Most of the studied women 486 (86.3%) falling in the age group (17-30year) and only 77cases (13.6%) ≥ 31 years.

Majority of them were from rural area 451 (80.1%), intermediate level of education 340 (60.3%), followed by highly educated 168 (29.8%), then noneducated were 55(9.76%). Most of the studied women were housewife 533(94.6%), 493 were multigravida (87.5%), primigravida were 70 (12.4%). In this study, 10 cases had anti-HCV positivity with ELISA (Sero prevalence of 1.7 %), of whom 8 cases were positive by PCR giving prevalence of (1.4 %), while one case was positive for HBs Ag by ELISA giving prevalence of (0.17%) and was positive by PCR. No co-infected pregnant women were detected (Table 1).

There was no significant association between HCV and HBV infection and residence ($P=0.598$), level of education ($P=0.248$), occupation ($P=0.363$), gravidity status ($P=0.995$) (Tab 2).

HCV positive pregnant women was significantly associated with history of Schistosomiasis, blood transfusion and was highly significant with dilation and curettage (D&C), general surgery, and dental extraction, But no significant association with family history ($P=0.160$) (Tab 3).

From the result of ALT, and AST determination, in the 8 positive samples for HCV it was found that 3 of them were high normal while the other 5 were within normal range. There was a high significant association between HCV positive cases and thromocytoenia, AST and ALT elevation, PT prolongation, But no significant association with low hemoglobin level (Table 4).

On the other hand, the positive HBs Ag case by ELISA was 28 years old

Because of very low numbers of HBV positive cases (one case), it had little association with

other risk factors. The laboratory values of the patients were normal (Random blood sugar, Platelets, ALT, AST, PT) except low hemoglobin less than 8 mg/dl.

Table (1): Seroprevalence of hepatitis B and hepatitis C infections among the study subjects.

<i>Variables</i>	<i>Status</i>	<i>NO</i>	<i>(%)</i>
HBsAg	Positive	1	(0.17)
Anti-HCV antibody	Positive	10	(1.7)
PCR HCV	Positive	8	(1.4)
Co-infection (HBsAg&HCV)	Positive	0	
Total		563	(100)

Table (2): Socio demographic characteristics of HCV patients.

Parameter	Total	HCV +ve		p-value
		NO	(%)	
Age group				
17-30y	486	4	(0.80)	0.001%
≥31y	77	4	(5.1)	
Residence				
Rural	451	7	(1.6%)	0.598
Urban	112	1	(0.9%)	
Level of education				
Non educated	55	2	(3.6%)	0.248
Intermediate	340	3	(0.9%)	
High education	168	3	(1.8%)	
Occupation				
Housewife	533	7	(1.3%)	0.363
Working	30	1	(3.3%)	
Gravidity status				
Primigravida	70	1	(1.4%)	0.995
Multigravida	493	7	(1.4%)	

Table (3): Association of potential risk factors and HCV infection among study subjects.

Variables	Total	HCV +ve		P value
		NO	(%)	
Family history of HCV				
Present	157	4	(2.5%)	0.160
Absent	406	4	(1%)	
History of abortion				
Present	177	2	(1.1%)	0.693
Absent	386	6	(1.6%)	
Schistosomiasis history				
Present	2	1	(50%)	0.028
Absent	561	7	(1.2%)	
History of episiotomy				
Present	380	4	(1.1%)	0.287
Absent	183	4	(2.2%)	
History of D&C				
Present	90	2	(2.2%)	0.483
Absent	473	6	(1.3%)	
History of blood transfusion				
Present	213	6	(2.8%)	0.029
Absent	350	2	(0.6%)	
History of general surgery				
Present	40	5	(12.5%)	<0.001
Absent	351	3	(0.9%)	
History of dental extraction				
Present	80	5	(6.3%)	<0.001
Absent	483	3	(0.6%)	

Table (4): Laboratory data in HCV patients.

Variables	Total	HCV positive cases N=8		P value
		NO	(%)	
Hemoglobin				
<8 gm/dl	147	1	(12.5%)	0.258
8-11 gm/dl	260	6	(75%)	
>11 gm/dl	156	1	(12.5%)	
Platelet count				
<150x10 ³ /mm ³	10	2	(25%)	<0.001
150-450 x10 ³ /mm ³	553	6	(75%)	
Random Blood sugar				
70-140 gm/dl	457	7	(87.5%)	0.645
> 140 gm/dl	106	1	(12.5%)	
ALT				
10-40 IU/L	556	5	(62.5%)	<0.001
>40 IU/L	7	3	(37.5%)	
PT(concentration/INR)				
11-14 sec	560	7	(87.5%)	<0.001
>14 sec	3	1	(12.5%)	
PTT				
25-35 sec	559	6	(75%)	<0.001
> 35 sec	4	2	(25%)	

DISCUSSION

HBV and HCV diseases are major health problems around the globe. Both infections are associated with a wide range of clinical presentations ranging from acute hepatitis to chronic infections that can be clinically asymptomatic or can lead to liver cirrhosis and even HCC [5, 6].

Infection with HBV that affects pregnant women can lead to mother disease and chronic newborn infection. Perinatal transmission of HBV results in chronic infection in 90% of infants; so, screening of all pregnant women for hepatitis B surface antigen (HBsAg) at the first antenatal visit to identify those who test positive is critical [7, 8]. The rate of HCV infection with fetal affection is controversial.

One question here why HBsAg, HCV Ab by ELISA were used in the current study, the answer can be driven from the published data emphasizing the accuracy of both tests as screening methods for HBV, HCV infection. Furthermore those tests are routinely done in practice.

The prevalence of HBsAg is 0.17% in this study appears to be low endemicity according to WHO guidelines for global HBV infection epidemiology, low endemicity (<2%, medium 2–7%, high >8%). Egypt is categorized as intermediate endemicity [9]. This figure is of low endemicity had been reported from other geographic regions 1.5% in Libya [10], 1.53% in Afghanistan [11]. However, the prevalence of HBsAg in this study is lower than prevalence rates of 4% in Egypt [12], 3.9% in Tanzania [13], in Pakistan 4.6% [14], and in Ethiopia 3.5% [15].

The prevalence in this study is also lower than prevalence rates of 7.9% and 7% reported among similar antenatal clinic attendees in Nigeria [16, 17], 10.2% in Kenya [18]. Differences in demographics, cultural practices and behavior of the study population for the risk of HBV infection, routine screening and immunization for HBV might explain these discrepancies.

In our study the single positive HBsAg case was in 28 years age, Age was not a significant risk factor for HBsAg, A possible reason for that is the small sample size of the current study. This result similar to Aba and Aminu [19]; who recorded the highest prevalence rates among women in age groups 21–25 years. Despite reports from other studies that some of these

factors may be associated with the risk of HBV acquisition, we cannot draw meaningful conclusion due to very low number of HBV positive cases.

The delivery method of single positive case had cesarean section history thus HBV significant associated with history of surgery (cesarean section). This finding is concordance with study by Fomulu et al [20].

Our study showed that the seroprevalence of anti-HCV antibodies was 1.7% and for HCV RNA by PCR it was 1.4%. This finding is much lower than anti HCV antibody seroprevalence rates in Nigeria of 3.6% [21], in Yemen 8.5% [22], study from Ethiopia 8% [23], 6.1% in some region in Egypt [24]. And even much lower than 10% prevalence rate reported among the general population in Egypt [2].

This results might be due to the difference in habit of using intravenous drug, exposure to blood transfusion, difference in efficiency of diagnostic kits used, and more introduction of direct antiviral and mass HCV treatment. In fact Egypt spend great effort for HCV eradication, The biggest mass screening program had been done by the Egyptian Ministry of health for diagnosis and treatment of HCV. This reduced the number of infected people and reduced the HCV reservoir in the community.

No coinfection of these viral hepatitis B and C were detected in our study, And this may be related to current efficient diagnostic and therapeutic efforts spend by Egypt.

This study had several limitations; it's a single center study. Furthermore, it's a cross section study and hence maternal & fetal affection hazards could not be assessed.

CONCLUSION

Prevalence rate of HBV & HCV were 0.17%, 1.7% respectively. This figure are much lower than local and international figures and this may related to current diagnostic and therapeutic intervention implanted in Egypt.

Acknowledgment:

The authors thank all colleagues who helped to conduct this study.

Ethical consideration: the study design was approved by the Institutional Review Board

(IRB) of Faculty of Medicine, Zagazig University.

Funding: no funding was received.

Conflict of interest: None

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