

Sero-Prevalence of Hepatitis B Virus and Hepatitis C Virus among Libyan Pregnant Women

Naamat Mahmoud Abid¹, Amel Azzeddin Morgham, Rima Mohamed Khawildi, Millad AlSaid Ghawil²

1. Aljala Maternity Hospital, Faculty of Medicine, University of Tripoli, Libya. 2. Pediatric Department, Tripoli Medical Center, Faculty of Medicine, University of Tripoli, Libya

Corresponding author: Amel Morgham, M.D., amelmorgham99@gmail.com

Abstract

Background: Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Human immunodeficiency virus (HIV) infections in pregnancy are associated with direct effects of pregnancy and a potential viral transmission from mother to newborn. In Libya; little is known on the prevalence of HBV, HCV and HIV infections and their associated factors among pregnant women. The main objective of this study was to determine the prevalence of HBV and HCV among pregnant women in Libya. **Method:** This cross sectional study was conducted in Tripoli Medical Center from January 2016 to December 2016. A total of 5251 pregnant women attending antenatal clinic (ANC) were consecutively enrolled in the study. **Results:** 5251 pregnant women enrolled in this study. The patient age between 18 to 42 years and all of them were married. The overall prevalence of HBsAg was 1.4% (74/5251) and HCV was 0.19% (10/5251). From these 74 positive patients; HBV was detected at higher rate in pregnant women aged between > 25 years [93.2% (69/74)] whereas in pregnant women aged < 25 years [6.8% (5/74)], the difference was statistically significant ($P > 0.05$). Most of the positive patients for HBV [89% (66/74)] and HCV [70% (7/10)] were multi-parity. Husband viral status of the infected pregnant patients; 44% of the husbands of the pregnant women were not infected (sero-negative) whereas only 16% were infected (sero-positive) and about 39.5% of them their viral status were not known. Significant number of the infected women about 50% gave history of exposure to dental procedures. Ninety six percent of neonates were born to HBsAg-positive mothers were born at term and 90% of them born with birth weight between 2 and 4 kilogram. **Conclusions:** Prevalence of HBV and HCV infections among pregnant women was significant. Adoption of HBsAg screening of all pregnant women will greatly assist in reducing the maternal transmission of HBV in Libya.

Keywords: HBV, HBsAg, HCV, Pregnant women

Introduction:

Chronic hepatitis B virus (HBV), hepatitis C virus (HCV) and HIV infections remain a major global public health concern. These viruses transmitted percutaneously, sexually and perinatally. Worldwide, 350 - 400 million individuals are chronically HBV infected; half of them acquired infection either perinatal or in early childhood, majority found in endemic areas (1). Annually, estimated more than 600,000 people die as a result of hepatitis B virus related liver diseases (2). HBV and HCV Infections to women during pregnancy are associated with increased risks of transmission this infections to a newborn (3, 4). This acquired infection during the pregnancy may lead to damage of liver tissues. Chronic HBV infection at birth is significantly high in infants born to hepatitis B (HBsAg) and hepatitis B e-antigen (HBeAg)-positive mothers (4,5).

Materials and Methods:

This cross sectional study among pregnant women attending antenatal clinics (ANC) was conducted from 1, January 2016 to 31, December 2016. The study was carried out at Tripoli Medical Center, Faculty of Medicine, University of Tripoli, Libya. Blood sample extracted from 5251 pregnant women attending to antenatal clinic. Blood were tested for HBsAg using ELISA techniques according to the

HBV, HCV and HIV share the common mode of transmission and co- infection in pregnancy is associated with increased morbidity, mortality in a newborn. In addition, maternal transmission of HBV predisposes the infected newborns to liver cirrhosis and Hepato-cellular carcinoma in young adulthood. The maternal screening programs and universal vaccination of infants have significantly reduced transmission rates (6,7,8). In literature; many studies demonstrated that HCV vertical transmission rate increases 2-4-fold if co-infected with HIV (9,10,11). Data regarding the prevalence of HBV and HCV in pregnant women and maternal transmission of the virus in Libya are lacking. The aim of this study is to determine the sero-prevalence of HBV and HCV infection in pregnant women in Tripoli, Libya.

manufacture's recommendations (Organon Teknika, WB Boxtel, The Netherlands). We using data standard structured questionnaires for collection information on social demographic characteristics including age, the viral status of the husband, nationality, occupational status, history of blood transfusion, history of dental procedure, drug abuse history, tattooing and bloodletting, mode of

delivery, birth weight, and condition of the baby. Informal consent was obtained from all participants in the study before blood samples were collected.

Statistical analysis: Data were entered and analyzed using computerized Statistical Program for Social Sciences (SPSS version Results:

Eighty six (1.6%) patients out of 5251 pregnant women were infected by HBV and/or HCV (table 1). According to the age distribution; about 55% of sero-positive HBV women were aged between (26-30 years), while nearly all HCV positive patients were above 25 years of age (table 2).

For the parity, most of our positive patients were Multiparous in frequency of 2-4 parity in all type of infections (table 3). However; analyzing the type of delivery, we found that the normal vaginal delivery were significantly the common frequent mode of delivery; (81%) of HBV positive patients and all HCV patients, while the elective cesarean section was the method of delivery in only 17.6% of HBV patients. Regarding the husband status of infected pregnant patients, the results showed significant number of them not known their viral status for HBV, while about 50% of the husband of pregnant women not infected (table 4). Regarding the patients occupations; we found that all types of infections (HBV, HCV) is

22). Descriptive statistics were used and all results are presented as frequencies, means \pm standard deviation and percentages. Categorical data were compared using the Chi-square test and Fisher's exact test if appropriate. A *p*-value of < 0.05 was considered statistically significant.

common in non-working patients. In HVB 59 patients out of 74 patients were house wife while in HCV patients; 7 out of 10 patients were house wife. Most of working patients were teachers and employers (table 5).

As a reason of infections, when we ask about blood transfusion history, we found that only 9 (8.7%) patients had history of it; while 94 (91.3%) patients not received blood while more than 50% of patients were exposure to dental procedure (table 6). In addition; the difference is significant in history of bloodletting cupping (traditional treatment), 15 (17.4%) positive patients (13 HBV, 2 HCV) had history of bloodletting cupping at least once while only 5 patients out of 86 (5.8%) had history of tattooing (two with HBV).

The baby status is remaining the important outcome assessment; we found that 96% of the babies were born at term and nearly 90% of them born with birth weight between 2 and 3.5 kilogram. Only 2.3% of babies born with birth weight less than 2 kilograms (table 7). In addition: about 15%

of the babies were admitted for different
reason to nursery most of then babies of

HBV positive mothers.

Discussion:

Chronic hepatitis B virus and HIV infections remain a major global public health concern. Hepatitis B and C viruses are the major causes of chronic liver disease. In Libya; some studies a general population had demonstrated that seroprevalence rate of HBV between 2.2-4.6 (12). We detected HBsAg in 1.4% (74/5251) of the pregnant women examined which is lower than the rate reported in the general Libyan population. Few studies were conducted regarding HCV and HIV in Libya. Regarding prevalence of HCV; documented by Daw et al (13) that is 1.2. Our result of HCV was 0.19% (10/5251) which is lower than the rate reported in Libya. In addition; we detected HIV was 0.23% (17/5251). Comparing with prevalence of HVB in Libyan pregnant women; we found that our study result is similar to El-Magrahe study result from Libya (1.5%) et al (14). The prevalence rates reported in our study is lower than what reported from the HBsAg in North Africa; 4%, 15.3% in neighboring Tunisia and Egypt (15,16) respectively. In addition; studies from the Middle East reported rates documented that prevalence in Saudi Arabia is 2.4% (17) and three times in more (4.3%) in Jordan (18). In Africa, numerous studies from Sub-Sahara countries showed that high prevalence rates of HBsAg were reported from Ghana and Nigeria is 10% (19,20). In our cohort; we observe that HBV more common in patients (50%) with age between 26-30 years of age. In literature; many studies reported that HBV infection in pregnant women increased with age (21).

There is limitation in the studies regarding the impact of maternal HBV and HCV infection on the risk for adverse pregnancy outcome. Our study showed similar results to Ai-Ming Cui et al (22) where the major part of newborn babies were born with normal weight (2-4kg). However; the preterm newborn was significantly less (1.4%) comparing with literature which vary between 2.9-11.5% (22,23, 24).

Conclusions: Prevalence of HBV and HCV infections among pregnant women was significant. Adoption of universal HBsAg screening of all pregnant women will greatly assist in reducing the maternal transmission of HBV in our country. In addition; the high risk of developing chronic HBV infection at birth among infants born to HBsAg-positive mothers is the administration of HBIG in combination with hepatitis B vaccine as post-exposure prophylaxis for such infants is of paramount importance. Important national protection programs which is started since 1993 by introducing the HBV vaccine free of charge to all newborns.

No Conflict of Interest

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Viral infection	No. (Prevalence) /5251	No. (%)
HBV	74 (1.4%)	74 (86%)
HCV	10 (0.19)	10 (11.6%)
HCV & HBV	2 (0.03%)	2 (2.3%)
Total	86 (1.6%)	86 (100%)

Table 1: Prevalence of HBV and HCV

Virus	18-25 yrs	26-30 yrs	> 30 yrs	Total
HBV	5 (6.8%)	40 (54.1%)	29 (39.2%)	74
HCV	1 (10%)	4 (40%)	5 (50%)	10
HCV & HBV	0	2 (100%)	0	2
Total	6 (7%)	46 (53.5%)	34 (39.5%)	86 (100%)

Table 2: Age group distribution.

Type of infection	Parity			Total
	One	2 – 4 parities	> 4 parities	
HBV	8 (10.8%)	50 (67.6%)	16 (21.6%)	74
HCV	3	4	3	10

	(30%)	(40%)	(30%)	
HBV&HCV	0	1 (50%)	1 (50%)	2
Total	11 (12.8%)	55 (64%)	20 (23.2%)	86 (100%)

Table 3: type of infections and maternal parity

Type of infection	Status of Husband			Total
	Infected	Not infected	Unknown	
HBV	10 (13.5%)	34 (46%)	30 (40.5%)	74
HCV	3 (30%)	3 (30%)	4 (40%)	10
HBV&HCV	1 (50%)	1 (50%)	0 (0%)	2
Total	14 (16.3%)	38 (44.2%)	34 (39.5%)	86 (100%)

Table 4: Status of her husband

Type of infection	Non-Working House wife	Working	Total
HBV	59 (79.7%)	15 (20.2%)	74
HCV	7 (70%)	3 (30%)	10
HBV&HCV	1 (50%)	1 (50%)	2
Total	67 (77.9%)	19 (22.1%)	86 (100%)

Table 5: Occupations and type of infections

Type of infection	Dental procedure		Total
	Yes	No	
HBV	41 (55.4%)	33 (44.6%)	74
HCV	4 (40%)	6 (60%)	10
HBV&HCV	2 (100%)	0 (0%)	2
Total	47 (54.6%)	39 (45.4%)	86 (100%)

Table 6: history of dental procedure

Type of infection	Birth weight			Total
	< 2 kg	2 to 4 kg	> 4 kg	
HBV	1 (1.4%)	65 (87.8%)	8 (10.8%)	74
HCV	0 (0%)	10 (100%)	0 (0%)	10
HBV&HCV	0 (0%)	2 (100%)	0 (0%)	2
Total	1 (1.2%)	77 (89.5%)	8 (9.3%)	86 (100%)

Table 7: type of infection and birth weight.