Epidemiology of hepatitis B and C in a pregnant woman in a tertiary teaching hospital in Jordan

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Summary

Background: Maternal infection with hepatitis can expose the newborn to subsequent chronic hepatitis. Acquired hepatitis is a preventable condition. A low percentage of hepatitis during pregnancy was found in this study to indicate successful adoption of the modern methods of infection control. Objective: Maternal infection with hepatitis B or C virus can expose the newborn to a subsequent chronic hepatitis infection. Perinatally acquired hepatitis B virus is a largely preventable condition. Herein, the authors aimed to determine the prevalence of hepatitis B and C virus infections among pregnant women. Materials and Methods: 48,556 pregnant women attending the delivery room between January 2005 and December 2016 were tested for hepatitis B surface antigen (HBsAg), hepatitis B antibody (HBsAb), hepatitis B e antigen (HBeAg), hepatitis B e antibody (HBeAb), hepatitis B core IgM (HBc IgM), hepatitis B core IgG (HBc IgG), and hepatitis C antibody (HCV Ab). The percentages of the above variables were determined. Results: Of the 48,556 women, 118 (0.24%) were found to have hepatitis, 107 (0.22%) with hepatitis B, and 11 (0.02%) with hepatitis C. HBsAg was positive in 102 (86.4%), HBsAb in six (5.1%), HBeAg in 14 (11.9%), HBeAb in 52 (44.1%), HBc IgM in seven (5.9%), HBc IgG in 51 (43.2%), and HCV Ab in 11 (9.3%). Acute hepatitis B was found in two (1.7%) women, chronic hepatitis B in 60 (50.1%), chronic hepatitis B and C in four (3.4%), chronic hepatitis C in seven (5.9%), chronic inactive hepatitis B in 39 (33.1%), latent hepatitis in two (1.7%), and resolved chronic hepatitis B in four (3.4%). Conclusions: A low percentage of seroprevalence of hepatitis B and C during pregnancy was found at a tertiary university hospital in Jordan.

Key words: Epidemiology; Hepatitis B; Hepatitis C; Pregnancy.

Introduction

Hepatitis B virus (HBV) is a major cause of chronic hepatitis, cirrhosis, and hepatocellular carcinoma [1]. Globally, in 2015, an estimated 257 million people were living with chronic HBV infection, and 71 million people with chronic HCV infection. [2]. Maternal infection with HBV or hepatitis C virus (HCV) can expose the newborn to a subsequent chronic hepatitis infection. However, perinatally acquired HBV is a largely preventable condition. The risk of vertical transmission depends on the status of hepatitis B surface antigen (HBsAg) and hepatitis B e antigen (HBeAg). Without prophylaxis, the risk of perinatal HBV infection in an infant with a HBsAg positive mother is less than 10% if the mother is HBeAg negative. This risk rises to 70-90% if positive for HBeAg [3]. If infected at birth, an infant has approximately a 90% chance of becoming a chronic HBV carrier and, when chronically infected, has a 15-25% risk of dying in adulthood from cirrhosis or liver cancer [4, 5]. However, early identification and prophylaxis is 85-95% effective in reducing the acquisition of perinatal infection [5]. Hepatitis C virus (HCV) infection is an important global health issue, with as much as 2-3% of the world’s population affected [6]. In industrialized countries, HCV is the most common cause of chronic liver disease in children [7]. Following the implementation of blood and blood product screening, vertical transmission has gained importance as the primary HCV transmission route among children [8]. More than one in every 20 children delivered by HCV chronically-infected women are infected, highlighting that vertical transmission likely constitutes the primary transmission route among children [9]. In the most recent systematic review and meta-analysis to provide the pooled risk of vertical HCV infection, Yeung et al. showed that the risk was 1.7% among children born to all HCV antibody–positive women and 4.3% among children of HCV RNA–positive women [10]. The most affected regions are WHO Eastern Mediterranean and European Regions, with the prevalence of 2.3% and 1.5%, respectively. Prevalence...
of HCV infection in other WHO regions varies from 0.5% to 1.0% (11). The diagnosis of vertical HCV transmission is not always straightforward because many infants born to mothers with HCV infection passively acquire trans-placental immunoglobulin G (IgG) antibodies up to 18 months after birth [12]. The aim of this study was to determine the prevalence of hepatitis B and C virus infection among pregnant women in a third world developing country.

Materials and Methods

The blood samples of 48,574 pregnant women attending the delivery room at Jordan University Hospital were tested for hepatitis B surface antigen (HBsAg), hepatitis B antibody (HBsAb), HBeAg, HBeAb, hepatitis B core IgM (HBc IgM), hepatitis B core IgG (HBc IgG), and hepatitis C antibody (HCV Ab), between January 2005 and December 2016, using an analyzer. The authors reviewed the old files for risk factors; no account was taken for the maternal age, gestational age, number of fetuses, and social and economic status. The dataset was analyzed using the Statistical Package for Social Sciences (SPSS) software, version 20.0. The study was approved by the Institutional Review Board of the Faculty of Medicine, University of Jordan.

Results

Immunity against HBV infection is via a response to HBcAg and HBsAg. Antibodies to HBeAg (anti-HBe) are indicative of infection: IgM anti-HBc signifies recent infection and usually disappears within six months, whereas IgG anti-HBc persists for life and indicates past infection. The presence of antibody against HBsAg (anti-HBs) appears after clearance of HBsAg or after immunization. HBsAg persisting for a period exceeding six months is defined as chronic HBV infection [13]. Among 48,574 attendances of pregnant women to the delivery room between January 2005 and December 2016, 136 screened positive for hepatitis B and C.

Discussion

Hepatitis B and C viruses during pregnancy have a high vertical transmission rate, causing fetal and neonatal hepatitis and maternal mortality [14]. Neonatal hepatitis can lead to chronic virus carriage, which may lead to liver cirrhosis and hepatocellular carcinoma [15].

The U.S. Preventive Services Task Force supports screening all pregnant women at the first prenatal visit to reduce vertical transmission of HBV. The American Acad-
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Table 3. — Hepatitis profile of the 118 women that screened positive for hepatitis B and C.

<table>
<thead>
<tr>
<th>Hepatitis profile</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute hepatitis B</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Chronic hepatitis B</td>
<td>60</td>
<td>50.1</td>
</tr>
<tr>
<td>Chronic hepatitis B and C</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Chronic hepatitis C</td>
<td>7</td>
<td>5.9</td>
</tr>
<tr>
<td>Chronic inactive hepatitis B</td>
<td>39</td>
<td>33.1</td>
</tr>
<tr>
<td>Latent hepatitis</td>
<td>2</td>
<td>1.7</td>
</tr>
<tr>
<td>Resolved chronic hepatitis B</td>
<td>4</td>
<td>3.4</td>
</tr>
<tr>
<td>Total</td>
<td>118</td>
<td>100</td>
</tr>
</tbody>
</table>

Prevalence of HCV is commonly positive in drug addicts, after blood transfusion, and in HIV positive mothers [26]. In Australia, 125 of 131 drug addicted pregnant women were reported to be HCV positive [27]. In developed countries, vertical transmission is a major route of HCV infection. In the United States, an estimated 240,000 children have antibodies to HCV, with seroprevalence of 0.1–0.2% (28), and is 2.8% in India [29].

It is evident that the serology of hepatitis viruses in low-income countries varies greatly. This variation in prevalence could be explained by the different risk factors. Sexual contact, perinatal infection, blood and its derivatives, hemodialysis, intravenous and percutaneous drug use, occupational, habitual, and social behavior have been identified as risk factors. The prevalence of HCV among pregnant women was reported to be 0.36% in Libya, 0.6% in Sudan, 0.7% in Saudi, 1% in Morocco, 2% in Gabon and in Uganda, 2.5% in Algeria, 3.21% in Iraq, 4.9% in Rwanda, 5% in Tanzania, 6.6% in the Democratic Republic of the Congo, 8.5% in Yemen, 8.6% in Egypt, 9.2% in Nigeria, and 16.5% in Malawi [21]. In this study, there were 11 women with hepatitis C, of whom seven women were chronic hepatitis B sufferers, with an overall percentage of 0.02%.

In summary, in this study, there were 118 women with hepatitis B and C, with an overall percentage of 0.24%, which compares well with the high-income world.

References

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