Gynecology & Obstetrics
ISSN: 2161-0932

Katke, Gynecol Obstet (Sunnyvale) 2015, 5:5
DOI; 10.4172/2161-0932.1000288

Research Article Open Access

The Impact of Maternal HbsAg Carrier Status on Pregnancy Outcomes: An Institutional Experience

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Abstract

Background: To examine the impact of maternal HBsAg carrier status on pregnancy outcomes.

Methods: Forty-seven carriers of Hepatitis B surface antigen (HBsAg) admitted in the antenatal ward were retrospectively studied and their obstetric outcome was assessed.

Results: The prevalence of HBsAg carrier status amongst indoor antenatal hospital population was found to be around 0.5%with average age of patients being 26 years. Amongst the study population 89% (40) patients delivered at term whereas only 4.4% (2) and 6.6% (3) patients had preterm delivery and abortions respectively. In our study 71.1% (32) delivered vaginally and the LSCS rate was found to be 22.2% (10) Only 2.2% (1) patient had hyperbilirubinemia and all patients had normal serum alamine transferase levels. Associated obstetric problem was found in 40%(18) of study population out of which meconium stained amniotic fluid and premature rupture of membranes were present in approximately 10% of cases each. Average birth weight in our study population was 2.8 kg. Neonatal intensive care unit admission was 7.1% (3) while stillbirth rate was around 2.3% (1) of total deliveries. All neonatal intensive care admission were for respiratory distress and they were later shifted to mother and discharged healthy making the live birth rate around 98%amongst total deliveries.

Conclusions: HBsAg carrier mothers are mostly asymptomatic and had excellent obstetric outcome. Meconium stained amniotic fluid and premature rupture of membranes are commonly associated obstetric problems. LSCS rate is comparable with general population. Active and passive immunization of neonate is the mainstay of management.

Keywords: HBsAg; Pregnancy outcomes; Population

Introduction

Hepatitis B infection is endemic in Asia and Africa. Its incidence has decreased in the United States by 80% since vaccination was introduced in 1980. Despite this there are estimated 1.2 million chronic carriers in the United States and 400 million worldwide. Hepatitis B is an important human carcinogen second only to tobacco (WHO) responsible for acute and chronic hepatitis, cirrhosis and hepatocellular carcinoma. Chronic infection follows in 5-10% of acute hepatitis and in 70-90% of infants [1]. Maternal-fetal transmission is the principal mode of transmission (Figure 1).

Other groups at risk of hepatitis B infection are

1. Intra-venous drug abusers
2. Spouses of acutely infected individuals
3. Homosexual men
4. Healthcare personnel
5. Patients who frequently receive blood products.

50% of initial Hepatitis B infections are asymptomatic

A variety of immunological serum markers have been identified in those with

a) Acute or chronic Hepatitis B

b) Previously infected but now immune

c) Chronic carriers of Hepatitis B

These markers detected by various techniques are

a) Hepatitis B virus - the Dane particle

b) Hepatitis B core antigen (HBcAg)

c) Hepatitis B surface antigen (HBsAg)

d) Hepatitis B envelope antigen (HBeAg)

e) Their corresponding antibodies.

After infection the first serological marker is HBsAg.

HBeAg signifies intact viral particles so detected during early hepatitis infection.

After acute hepatitis approximately 90% of individuals recover completely. 10% remains chronically infected and 1/4th of chronic infection converts to cirrhosis and out of these, who are seropositive for HBeAg are at risk for Hepatocellular carcinoma [2].

Clinical course of acute HBV is similar to that of HAV and is not altered by pregnancy in developed countries. However, in developing world the scenario is different [1]. Treatment is supportive but the likelihood of preterm delivery is increased.

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Received March 07, 2015; **Accepted** April 17, 2015; **Published** April 23, 2015

Citation: Katke RD (2015) The Impact of Maternal HbsAg Carrier Status on Pregnancy Outcomes: An Institutional Experience. Gynecol Obstet (Sunnyvale) 5: 288. doi:10.4172/2161-0932.1000288

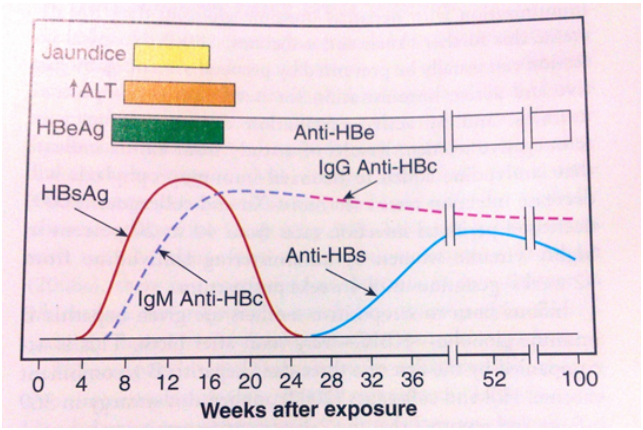

Figure 1: Sequence of appearance of various antigens and antibodies in acute hepatitis B (Courtesy: Williams Obstetrics 23rd E.).

Most HBV infections identified during pregnancy are chronic asymptomatic and diagnosed by routine prenatal serological screen as recommended by ACOG (2007). Although these women have chronic hepatitis they are mostly asymptomatic. Transplacental viral infection is uncommon and most neonatal infections are transmitted by peripartum exposure. There is no evidence to suggest that cesarean delivery lowers the risk [3].

Although the virus is present in breast milk, incidence of transmission is not lowered by formula feeding. Mothers with HBsAg and HBeAg positive are more likely to have vertical transmission whereas those positive with Anti-HBe Antibody are not infective.

In our setup asymptomatic HBsAg patients are not subjected to further immunological evaluation due to economical constraints and neonatal immunoprophylaxis given to all cases. We tried to assess overall obstetric outcome in this population in order to assess institutional management in Indian scenario.

Materials and Methods

Cama and Albless hospitals are a tertiary care Institute located in South Mumbai, catering approximately 3000 deliveries per year. The obstetric data from Cama and Albless Hospitals was analysed in the present retrospective observational study. All cases of Hepatitis B surface antigen positive antenatal cases, admitted to antenatal ward during 2 year period from 1st January 2013 to 31st December 2014 were included in the study. All case sheets studied in details, events and outcome noted till discharge from the hospital. Excel sheet prepared and results analysed.

Inclusion criteria

All pregnant admitted patients in antenatal ward during the study period who were tested positive for hepatitis B surface antigen by hepacard method and later confirmed by ELISA.

Exclusion criteria

Antenatal patients tested positive in outdoor patient department but delivering elsewhere are not included in study.

Total 8467 patients were admitted during the study period out of which 47 cases were HBsAg positive. Out of 47 patients 2 patients lost follow up and delivered outside.

The primary objective was to study the obstetric outcome in Hepatitis B carrier patients with the secondary objective to assess management in antenatal cases in resource restricted population .

Results

Our observations are as follows:

Prevalence: We had total 47 number of HBsAg positive cases from 1st January 2013 to 31st December 2014 admitted to our antenatal ward amongst total 8467 antenatal admissions during the same period. So the prevalence of HBsAg positive cases is 0.5% amongst indoor antenatal population.

Age: The average age of total antenatal HBsAg carrier cases was 26 years ranging from 18 to 36 years.

Booked status and total visits

Table 1

85.11% (40) cases were booked in our institute and all were diagnosed during routine antenatal screening.

Study population had an average of 4 antenatal visits with a range of 1 to 8 visits.

Gravid status

Table 2

Majority of 51% (24) cases were second gravida while 38.3% (18) cases were primigravida.

Fetal maturity

Table 3

Out of total study population 89% (40) patients delivered at term whereas 4.5% (2) patients had preterm delivery and 6.6% (3) abortion, out of which 4.44% (2) were induced abortion.

Mode of delivery

Table 4

Vaginal delivery 71.1 % (32) was the commonest mode of delivery in our study population. LSCS rate is 22.2% (10).

Type	Number (N=47)	Percentage(%)
Booked	40	85.1
Unbooked	4	8.5
Booked in private	3	6.4

Table 1: Booked status of study population.

Gravid status	Number (N = 47)	Percentage (%)
Primi	18	38.3
Second	24	51
Third	4	8.5
Fourth	1	2.2

Table 2: Gravid status distribution of study population.

Type	Number (N = 45)	Percentage (%)
Term	40	89
Preterm	2	4.4
Abortion (Spontaneous)	1	2.2
MTP	2	4.4

Table 3: Fetal Maturity in study population.

Mode of delievery	Number (N = 45)	Percentage (%)
Vaginal Delivery	32	71.1
LSCS	10	22.2
Abortion	3	6.7

Table 4: Mode of delievery in study population.

Obstetric complication	Number (N = 45)	Percentage (%)
None	27	60
MSAF	5	11.2
PROM	4	9
IUGR	1	2.2
Oligohydramnios	1	2.2
Anaemia	2	4.4
Previous Ectopic	1	2.2
IUFD	1	2.2
Rh Incompatibility	1	2.2
Thrombocytopenia	1	2.2
Vaginitis	1	2.2

Table 5: Associated Obstetric complication amongst study population.

Laboratory findings

Only 2.2% (1) patient had hyperbilirubinemia amongst study population.

All study population had normal serum alamine transferase levels.

Associated obstetric complication

Table 5

Meconium stained amniotic fluid and premature rupture of membranes were present in 11.2% (5) and 9% (4) of cases respectively.

Birth weight

Average birth weight in the study population is 2.8 kg ranging from 1.8 kg to 3.8 kg.

Neonatal immunoprophylaxis

Out of the total study population7.14% (3) of neonates did not received immunoglobulins against Hepatitis B at birth. It is because of technical delay in ELISA reports.

Neonatal outcome

Table 6

90.5% (38) neonates were shifted to mother after delivery. Out of 7.1% (3) NICU admissions, all for respiratory distress, were later shifted to mother and discharged healthy. So almost 98% was the live birth rate in the study population.

Discussion

The HBsAg carrier prevalence in antenatal case is 1% in the United States. Prevalence of Hepatitis B in Indian population varies from 2-4% in non-tribal and 15.9% in tribal population [4]. The prevalence of mean HBV carrier state in India in antenatal case is 0.82% by a study by Chatterjee et al. [5]. In our study the prevalence rate is found to be around 0.5% amongst indoor antenatal population with average age as 26 years which is fairly comparable to the given study.

As such, the corresponding lower carrier rate was consistent with the effectiveness of the immunization programme. Current medical literature also provides evidence for the success of universal neonatal hepatitis B vaccination programme. Immunising infants of HBsAg and HBeAg- positive mothers, with a combination of hepatitis B immunoglobulin and hepatitis B vaccine after birth reduced the risk of transmission from 90% to less than 10% [6,7]. The transmission rate was even lower if the mother was HBeAg- negative. In 1990, World Health Organization (WHO) recommended universal vaccination against hepatitis B in all nations. By the end of 2007, a total of 171 (88%) of the 193 WHO member states reported having integrated HBV vaccines into their routine infant vaccination schedules. The coverage rate with three doses of HBV vaccines has increased from 32% in 2000 to 65% in 2007 [8].

Antenatal screening of hepatitis B is available at tertiary care institutes and in High risk population in India. 85.1% (40) cases were booked in our institute and all were diagnosed during routine antenatal screening. In our study 51% (24) cases were second gravida while 38.3% (18) cases were pregnant for the first time, 4.4% (2) patients had preterm delivery, 6.6% (3) had abortion, out of which 4.44% (2) were induced. Our study did not suggest a higher rate of preterm delivery. This is in contrast to a study of Tse KY et al which suggests an increased risk of preterm delivery with HBsAg carrier state [9].

In our study 71.1% (32) delivered vaginally and LSCS rate is 22.2% (10) which is comparable to the general population. Elective LSCS in HbsAg carrier doesn't improve the vertical transmission rate [1]. The National Institute for Health and Clinical Excellence advises against elective Caesarean section for the prevention of mother-to-child transmission of hepatitis B, as evidence on this issue is insufficient.

Only 2.2% (1) patient had hyperbilirubinemia and all patients had normal serum alamine transferase values. So most of the cases were asymptomatic.

Majority of study cases had no associated obstetric problem. Meconium stained amniotic fluid and premature rupture of membranes were present in 11.2% (5) and 9% (4) of cases respectively. No evidence of PIH or Gestational Diabetes Mellitus (GDM) was found in our study. A German study performed by Lobstein et al. revealed no significant differences in point prevalence of GDM and PET in carriers and non-carriers [10]. Besides, To et al. evaluated 1340 HBsAg positive women, and estimated that there was a lower risk for gestational hypertension and pre-eclampsia than in non-carrier [11].

Average birth weight in our study population is 2.8 kg. Shui-Lam MAK et al. study showed that HBsAg carriers delivered slightly larger babies [12]. Whether this was related to missed cases of GDM requires further studies. According to the Hong Kong College of Obstetricians and Gynaecologists, HBsAg carriage is regarded as a risk factor for GDM in Asian (including Chinese) women [13].

Our study did not suggest worse perinatal outcomes in subjects with hepatitis B antigenemia, in terms of preterm labour, rates of macrosomia, mean birth weight, stillbirth rates, and NICU admissions. In the study performed by Wong et al perinatal outcomes were comparable in HBsAg carriers and non-carriers [14].

In presence study 7.14% of neonates did not received immunoglobulins against HBV at birth. It is because of technical delay in obtaining ELISA reports of card positive mothers. Passive immunization with immunoglobulin and simultaneously active

Outcome	Number (N = 42)	Percentage (%)
Baby with Mother	38	90.5
NICU admission	3	7.1
Still birth	1	2.4

Table 6: Neonatal Outcome in study population.

immunization with 3 doses of Hepatitis B vaccine in all new borns of HBsAg carrier mother with HBeAg –ve status gives excellent protection and it is to be stressed upon the healthcare professionals.

One limitation of our study was its reliance on retrospective data and detailed information like HBsAg viral load and HBeAg status were lacking. Such data were not available because they were not routinely checked in our institution due to financial constraints.

Conclusion

The point prevalence of HBsAg carriers was lower in women average aged 26 years. This was consistent with benefits of the universal neonatal hepatitis B vaccination programme. Most of the cases were asymptomatic. There was no increased risk of preterm delivery noted in our case study of HBsAg carrier patients. There was no other obstetric complication like PIH or GDM noted in our study group. Meconium stained amniotic fluid and premature rupture of membranes were present in approximately 10% of cases each. The mean birth weight of babies delivered by hepatitis B carriers was significantly higher. Further studies should explore these associations in detail. Universal screening of all antenatal cases with simultaneous active and passive immunization of neonate should be the main stay of treatment in this population in resource poor set ups.

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