

Prevalence of Hepatitis B and other infections among pregnant women seen in a referral centre in Brunei Darussalam

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ABSTRACT

Introduction: Chronic Hepatitis B virus (HBV) and Hepatitis C virus (HCV) infections are common causes of chronic liver disease. In the Asia-Pacific region, mother to infant transmission (vertical transmission) is the most common mode for HBV. On the other hand, perinatal HCV transmission is relatively low. This epidemiological study assessed the prevalence of HBV and HCV among pregnant women delivering in a tertiary referral centre in Brunei Darussalam. Data also provided information on Human Immunodeficiency Virus (HIV) and syphilis infection. **Materials and Methods:** All patients who delivered over a 12-month (January 2011 to December 2011) period were included. Patients were routinely tested for HBV, Hepatitis B surface antigen (HBsAg), HIV and Venereal Disease Reference Laboratory (VDRL). In-patients (n=125) found to be HBsAg positive, or who did not have any ante-natal care testing, were tested for Hepatitis Be Antigen (HBeAg) and Anti Hepatitis Be Antibody (Anti-HBe Ab) and anti-HCV). **Results:** The overall prevalence of HBsAg positive was 1.02%, significantly higher among the Chinese (2.4%), indigenous (4.0%) and expatriates (1.5%) than among the Malays (0.8%) ($p < 0.05$ for trend). Among those with HBsAg positive, 22% were found to be positive for HBeAg. The most common identified risk factor for patients was family history of hepatitis B infection (37%). Two patients were positive for HIV (0.04%) and six for VDRL (0.11%). No patient was found to be positive for HCV. **Conclusions:** The HBV infection rates among our patients are lower than previously reported but the ethnic differences remain. Of those found to be positive, a fifth was positive for HBeAg. No patients were found to be positive for HCV.

Keywords: Viral hepatitis, antenatal screening, prevalence, risk factors, transmissible infections

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INTRODUCTION

Infections are important causes of morbidity and mortality especially in the developing and underdeveloped nations. Modes of transmis-

sion are generally dependent on the organisms and systems involved. Perinatal transmission remains an important mode of transmission of infections. Of the infections transmissible from mother to child, Hepatitis B Virus (HBV) and Human Immune-Deficiency Virus (HIV) are the two most common worldwide, especially in developing countries where the prevalence rates for these infections are high.^{1, 2} The risk of HBV transmission is as high as 90% if the mother is positive for the Hepatitis B envelope Antigen (HBeAg) but is between 10 to 20% if negative.³ Transmission of Hepatitis C virus (HCV) during the perinatal period can also occur but is generally much lower.⁴ Perinatal transmission can be reduced through routine antenatal screening as it allows early detection and implementation of appropriate measures and treatment.

A previous study conducted in our local setting more than two decades ago showed that the prevalence of HBV infection among pregnant women was 3.2% with ethnic differences.⁵ This present study assesses a) the prevalence of the infections included in routine antenatal screening, and HCV infection among Hepatitis B surface Antigen (HBsAg) positive pregnant women admitted to the labour ward of the Raja Isteri Pengiran Anak Saleha (RIPAS) Hospital, Brunei Darussalam, and b) the presence of relevant risk factors associated with HBV infections.

MATERIALS AND METHODS

Setting: RIPAS Hospital is a 550 bed hospital and is the largest tertiary referral hospital in Brunei Darussalam. It handles all complicated pregnancies in the country as well as routine deliveries. Annually, there are almost 7,000 deliveries in Brunei and RIPAS hospital han-

dles five to six thousand of these deliveries.

Patients: Pregnant women attending the antenatal clinics in Brunei Darussalam are routinely screened for HBV, Syphilis (VDRL Test), and HIV. Appropriate measures were taken if a patient was found to be positive for any of these conditions and the patient is referred to the appropriate specialties for further evaluations and measurement. Post-delivery, all infants are given hepatitis B vaccination at 0, 1 and 6 months. Hepatitis B immunoglobulin G (HBIGG) is only given to infants of Hepatitis B seropositive mothers after consultation with the paediatricians.

All pregnant women admitted to the labour ward of RIPAS hospital for delivery in a period of 12 months (1st January 2011 to 31st December 2011) were included in this prospective study. The patients' antenatal records were checked to assess their HBV status. Patients who were positive for Hepatitis B were also checked for HCV. Tests for both HBV and HCV were arranged for patients who did not have any antenatal screening prior to admission.

Serological tests evaluated included HBsAg, HBeAg, anti-HBe, Hepatitis B core antibody (anti-HBc) and hepatitis C antibody (anti-HCV). All tests were performed with a chemiluminescent immunoassay using the Roche Cobas 6000 platform (sensitivity >95%, specificity >95%). Anti-HCV positive samples were confirmed by Serodia manual test (agglutination test) and Innolia (Western Blot test).

Data collection: Patient's age, gravidity, parity, marital status and occupation were ob-

tained from the patient’s antenatal card. Additional data were collected after informed consent from patients who were positive for HBV or HCV. Risk factors such as previous blood and blood product transfusion, intravenous drug use, tattooing, family history of hepatitis, history of jaundice, surgery, dental surgery or interventions were inquired using a self-report questionnaire. Information relating to husband/partners such as age, occupation, intravenous drug use, history of jaundice and number of marriages were also requested.

Data analyses: Data were entered using Microsoft Excel spreadsheet software and were later transferred into SPSS (Chicago, IL, USA) Version 17.0 for analysis. Data analysis includes descriptive analysis and analysis of estimation of proportions.

RESULTS

Over the year period, there were a total of 5,288 deliveries with a majority Malays, consistent with the national population racial distribution.

Of all the patients surveyed, 71 (1.34%) did not have any antenatal care or screening prior to admission. The overall positivity rate for the screening was 1.2% (n=62)

which included two cases of HIV positivity (0.04%) and six cases of VDRL positive (0.11%).

The prevalence of HBsAg positive among the different racial groups is shown in Table 2. The rate was higher among the Indigenous group followed by the Chinese.

Of the patients found to be positive for HBsAg positive, 22% (n=12) were positive for HBeAg, 72% (n=39) were anti-HBe positive and 80% (n=43) were anti-HBc positive.

Of the 52 patients, 65% were in the 20 to 34 year age group and 35% were 35 years and above. Fifteen percent were nulliparous. Three (5.5%) were single and 51 (94.5%) were married: five more than once (four twice, one three times).

The risk factors for HBV infections are shown in Table 3. Twenty percent were not aware of their family’s HBV status. Only one husband had a history of hepatitis. Five were unaware of their husbands’ status.

Among the 125 women who tested positive for HBsAg or had risk factors for blood borne infections, none were found to be

Table 1: Prevalence of Hepatitis B, HIV and VDRL sero-positivity.

Total deliveries	Hepatitis B seropositive	HIV positive	Syphilis (VDRL)
5,288	54 (1.02%)	2 (0.04%)	6 (0.11%)

Table 2: Prevalence of Hepatitis B (HBsAg +ve) among the different ethnic groups.

HBsAg (+ve)	Ethnic groups				Total
	Malays	Chinese	Indigenous	Expatriates	
HBsAg (+ve)	36 (0.8%)	3 (2.4%)	5 (4%)	10 (1.5%)	54 (1.02)
Total	4,376	124	125	663	5,288

Table 3: Risk factors for Hepatitis B.

Risk factors	N (%)
Family history of Hepatitis	20 (37)
Surgery	15 (28)
History of blood transfusion	9 (16.7)
Dental procedure	7 (13)
Jaundice	4 (7)
Tattoo	1 (2)
Intravenous drug use	0 (0)
No antenatal care	2 (4)

DISCUSSION

Antenatal screening is important as it allows detection of any mother to child transmissible infections. This allows measures to be instituted for expectant mothers and children, and public health measures such as contact tracing. Of the infections routinely screened, HBV and HIV are the most important as the perinatal transmission rates are high for these two infections. Furthermore, these two infections are common in certain geographical regions and population groups, hence increasing the risk of perinatal transmissions.

Globally, an estimated two billion people have been exposed to the HBV with an estimated 350-400 million having chronic HBV infection.^{1, 6} High endemic regions (5-20% carrier rate) include the Asia-Pacific regions, the Amazon Basin, Alaskan natives, Eastern Europe, Middle East and Africa. Low endemic regions (1-4% carrier rate) include developed nations such as the North America, Western Europe and Australia.⁷ While 95% of infections acquired during adulthood are cleared, only 10% of neonates and children clear the initial infection, thus placing them at higher lifetime risk of chronic liver diseases and the associated complications.⁸ In the Asia-Pacific

region, HBV is an important cause of death through liver failure and hepatocellular carcinoma. Therefore, it is especially important to ensure that all pregnant women in the endemic regions are screened, so that preventive measures can be instituted. In Taiwan, introduction of the national vaccination programme led to significant reduction of the incidence of hepatocellular carcinoma in children.⁹

In our study, we showed that the prevalence of HBV was 1.02%, significantly higher among the indigenous, Chinese and the other groups compared to the Malays. Compared to a previous study carried out almost three decades ago in our local setting, the infection rate has significantly dropped among pregnant women ($p < 0.05$): Sebastian *et al.* reported a prevalence of 3.2% among 1,267 pregnant women who attended the antenatal clinic of a district general hospital in 1989.⁵ The ethnic differences in the prevalence of HBV in both studies remain. Since then, there had been no further study looking at HBV infection among this group of patients. Our findings are not unexpected given the general improvement of healthcare (vaccination was introduced in 1984 for the high risk group and universal vaccination started 1988 in Brunei Darussalam) and improved standard of living. Declining infection rates among blood donors in our local setting have been reported.¹⁰ Not unexpectedly, ethnic differences were also seen among blood donors with the Malays having the lowest prevalence.

Our rate is noticeably lower or comparable to the rates reported from other developing countries: Iran (6.5%)¹¹, Sudan

(5.6%)⁶, Oman (7.1%), Qatar (1%), United Arab Emirates (1.5%)¹², rural Bangladesh (0.4%)¹³ and Pakistan (1.57%).⁷ A study from Ipoh, Malaysia reported a rate of 1.35%.¹⁴ To date, there are no recent published data for many parts of the Southeast Asian region. An older study from Manila, Philippines reported a prevalence of 7.6%.¹⁵ However, the current rate is likely to be lower. Not unexpectedly, our rate is much higher than the rates reported from developed countries. The rates reported in the United States in 2003 varied across the four regions surveyed; white non-Hispanic (0.60%), black non-Hispanics (0.97%), Hispanics (0.14%) and Asians (5.79%).⁸ Similar low rates have been reported in the other Western developed nations.

Among our patients who were HBsAg positive, 20% were positive for HBeAg, a traditional marker for active replication.¹⁶ Based on our result, it is suggested that 20% of HBV positive patients are considered highly infectious and this represents a group for which additional steps need to be taken to reduce the risk of perinatal transmission. With the current understanding, HBV DNA is now a more important test to assess infectivity as even HBeAg negative status can be associated with high viral count.¹⁶

Similar to HBV, HIV infection is still a major public health issue in many parts of the world including some Southeast Asian nations. In Brunei Darussalam, HIV infection is still uncommon but there has been a steady slow increase in case detection.¹⁰ In our study, we only detected two cases. Despite the low yield and overall low prevalence of HIV, screening is important as effective measures to reduce

Unlike HBV and HIV, perinatal transmission of HCV is relatively low and is reported to be between 3 and 5%.^{17, 18} However, the risk is much higher in the presence of HIV co-infection. Given its relatively low prevalence in pregnant women and the cost-ineffectiveness of screening, HCV screening has not been included in the antenatal screening panel. This is in line with policies from the United Kingdom¹⁸, United States¹⁹ and Australia.²⁰ However, perinatal transmission of HCV can occur. Importantly, patients with HCV have been shown to be at higher risk for baby born preterm, low birth weight and congenital anomalies making interventions for future pregnancies important. In our study, we did not find any case positive for HCV. Despite this, testing is still probably useful in patients with risk factors such as a previous history of intravenous drug use, abnormal liver profiles, history of receiving blood products before the HCV screening, those positive for HIV or who have partners known to be HCV positive.

Among the only non-viral infections screened during the antenatal period, syphilis has now become extremely rare in developed and many developing countries. However, screening remains important as intrauterine infection is associated with foetal abnormalities and significant comorbidities. Furthermore, there are also effective treatments. In our setting, the prevalence rate of VDRL positivity was 0.11%, again significantly lower than the rate reported in the previous local study.⁵

Overall, our results suggest that prevalence of HBV and syphilis infections are decreasing in our local setting. The prevalence

of HIV remains low but this will require continued surveillance. Encouragingly, no HCV was detected among the small subset of patients tested. This is probably a reflection of the declining prevalence of HCV in the general population according to a blood donor study.¹⁰ Despite the number being low, it is a concern that 1.3% did not have any antenatal screening. Of these, two patients were found to be positive for HBV. While the overall result is an indication that the current system is working, more needs to be done to achieve 100% antenatal registration.

In conclusion, our study showed that HBV infection is still the most common infection detected in antenatal screening, lowest among the Malays. A fifth was positive for HBeAg. The most common risk factor is still a positive family history of HBV infection. Only two cases of HIV were detected and none for HCV. Overall, our rates are significantly lower than the rates reported more than two decades ago from another district but the ethnic differences remain for HBV infection.

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Brunei Darussalam - Healthcare in Pictures



Newspaper clipping showing the Brunei delegates at the 1989, 7th World Transplant Games that was held in Singapore. The first delegate is Dato Sherlock Chin (Renal Specialist), one the historical pioneers (to be featured in a future issue of BIMJ).
