A Ten-Year Trend of the Prevalence of Hepatitis B Surface Antigen in Pregnant Women at Songklanagarind Hospital


ABSTRACT

This is a longitudinal retrospective study. We summarized the age and hepatitis B surface antigen (HBsAg) results of all pregnant women who attended Songklanagarind Hospital’s antenatal clinic, Songkla, Thailand from 1995 to 2004. The Department of Pathology provided the laboratory database of all 14,077 pregnant women. The annual cases in year 1995 to 2004 were 1,175, 1,312, 1,398, 1,450, 1,534, 1,619, 951, 1,444, 1,586 and 1,608, respectively. The prevalence rate of HBsAg ranged from 2.6 to 4.7 percent, but these were not significantly different (p >0.05). The average prevalence rate of HBsAg over the ten-year period was 3.4 percent. The mean age was 27.7 years old with a standard deviation of 6.2 years. The age group of < 20 years had the lowest prevalence rate, while the age groups of 31-35 and > 36 years had the highest rate (p < 0.05). It was concluded that even though the prevalence of HBsAg in pregnant women over a ten-year period were not significantly different, the lowest rate observed in the younger generation (the age group < 20 years) may be due to a universal HBV vaccination implemented by the government policy beginning in 1992. (J Infect Dis Antimicrob Agents 2005;22:111-4.)

INTRODUCTION

Hepatitis B virus (HBV) infection is a public health problem worldwide, but the prevalence of HBV carriers has a wide global variation. In Asia especially Southeast Asian countries, the prevalence is 8-15 percent of the population, classifying these countries as having a high endemicity of HBV infection.1-2 The remaining parts of the world fall into intermediate and low endemicity, with the prevalence of 2-7 percent and less than 2 percent, respectively.3 Almost one-third of the

Department of Pathology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkla 90110, Thailand.

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Reprint request: Sukone Pradutkanchana, M.Sc., Department of Pathology, Faculty of Medicine, Prince of Songkla University, Hat Yai, Songkla 90110, Thailand.

E-mail: sukone.p@psu.ac.th

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carriers will develop chronic liver disease, including chronic hepatitis, cirrhosis, and hepatocellular carcinoma, one of the most common cancers in the world.\textsuperscript{4} Solving this problem will require a large sum of money, equipment, and public health personnel.

Previous studies in Thailand have shown that the prevalence of hepatitis B surface antigen (HBsAg) is approximately 8-10 percent.\textsuperscript{5,6} And several studies on the prevalence of HBsAg in Thai pregnant women showed the rates ranging from 4.1 to 8.4 percent.\textsuperscript{7-10}

At Songklanagarind Hospital, a one-thousand-bed university hospital in Songkla, Thailand, we recorded most laboratory results in a computerized database system for a period of more than 10 years. This study sought to determine a ten-year trend of the prevalence of HBsAg in pregnant women who attended the antenatal clinic of our hospital.

**MATERIALS AND METHODS**

The study design was a longitudinal retrospective study. The serum sample was collected from the pregnant women and store at -20°C until tested within one week after collection. The test was performed using a two-step enzymed-linked immunosorbant assay (ELISA) (Enzygnost HBsAg 5.0: Dade Behring). We summarized the age and HBsAg results of all pregnant women who attended the antenatal clinic from 1995 to 2004. The Department of Pathology provided the laboratory database of all 14,077 pregnant women. The descriptive statistics were used in determining the prevalence rate of HBsAg. Double comparison using Chi-square test at a 95 percent confidence interval and multiple comparison using the least significant difference (LSD) were calculated using the Statistical Packages for the Social Science release 9.05 (SPSS, Chicago, USA). The statistical significance was considered when a p value was less than 0.05.

**RESULTS**

From 1995 to 2004, there were 14,077 pregnant women who attended the antenatal clinic of Songklanagarind Hospital. The annual cases in year 1995 to 2004 were 1,175, 1,312, 1,398, 1,450, 1,534, 1,619, 951, 1,444, 1,586, and 1,608, respectively. The prevalence rate of HBsAg ranged from 2.6 to 4.7 percent ($\chi^2 = 0.199$) (Figure 1). The average prevalence rate of HBsAg over the ten-year period was 3.4 percent. The mean age was 27.7 years old with a standard deviation of 6.2 years. However, the age data was not available in 54 cases (0.4%). The age was categorized into five groups. The prevalence of HBsAg according to these five groups is not significantly different ($\chi^2 = 0.022$) (Table 1). Multiple comparison using the LSD revealed that the prevalence in the age group of $< 20$ years was the lowest, and was significantly different from the age groups of 31-35 and $> 35$ years ($p = 0.007$ and 0.025, respectively).

**DISCUSSION**

This study showed that the prevalence of HBsAg in pregnant women during a ten-year period was stable, between 2.6-3.5 percent except in the year 2000 which the rate was peaked as high as 4.7 percent. However, there was no statistic significance in this spike ($p > 0.05$). The average prevalence over the ten-year period was 3.4 percent. This rate was relatively low, compared to previous studies which showed the prevalence ranging between 4.1-8.4 percent.\textsuperscript{6-10} This may be due to the geographic variation among regions, or due to a difference in the detection method used. Indeed, the previous study that reported the highest prevalence used the reagent kit developed by the National Institute of Health, Ministry of Public Health, Thailand.\textsuperscript{10} This is opposed to the two studies which used the commercial microparticle enzyme immunoassay\textsuperscript{7} or the commercial reverse passive hemagglutination assay\textsuperscript{6}, respectively.
The other two studies had not specify the detection method used. In our study, we use the commercial two-step ELISA. Furthermore, the prevalence of HBsAg in our study was slightly low, compared to that reported in Thai blood donors, ranged from 4.0-3.8 percent over the three-year period from 1989 to 1991. In general, Thai female blood donors had lower prevalence than male blood donors (2.9-2.5% vs 4.2-4.3%).

As recommended by the government policy in 1992, every newborns will be given an HBV vaccine as primary immunoprophylaxis. After 1992, the incidence of HBV infection reported to the Ministry of Public Health began decreasing. In addition, the trend of the prevalence of HBsAg among Thai blood donors decreased from 8-10 percent in 1976 to 4-7 percent during 1988 and 1993. In our study, the prevalence of HBsAg in the younger generation (the age group of

**Table 1. The prevalence of HBsAg in pregnant women at Songklanagarind Hospital according to the age groups.**

<table>
<thead>
<tr>
<th>Age group (year)</th>
<th>Total cases</th>
<th>Prevalence rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20</td>
<td>1,636</td>
<td>2.6</td>
</tr>
<tr>
<td>21-25</td>
<td>3,367</td>
<td>3.3</td>
</tr>
<tr>
<td>26-30</td>
<td>4,466</td>
<td>3.0</td>
</tr>
<tr>
<td>31-35</td>
<td>3,087</td>
<td>4.0</td>
</tr>
<tr>
<td>&gt; 36</td>
<td>1,467</td>
<td>4.0</td>
</tr>
<tr>
<td>All ages</td>
<td>14,023</td>
<td>3.4</td>
</tr>
</tbody>
</table>
< 20 years) was the lowest and was significantly different from the age group > 31 years who had the highest rate (p < 0.05) (Table 1). A universal HBV vaccination may lead to a decrease in the vertical transmission of HBV, which is an important factor in maintaining the persistence of a high prevalence of HBsAg. The trend of the prevalence of HBsAg in Thai population should decrease continuously. In conclusion, even though the prevalence of HBsAg in pregnant women over a ten-year period was not significantly different, the lower rate observed in the younger generation (the age group < 20 years) may be due to a universal HBV vaccination implemented by the government policy beginning in 1992.

References