The Prevalence of Hepatitis B in Premarital Counseling Clinic at Siriraj Hospital

Surasak Angsuwathana MD*, Thanyarat Wongwananuruk MD*,
Korakot Sirimai MD*, Manopchai Thamkhantho MD*,
Chalida Raorungrot MD*, Sarinya Sukamongkol Sc*

** Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand*

Objective: *To study the prevalence and associating factors of hepatitis B infection in the Premarital Counseling Clinic at Siriraj Hospital.*

Material and Method: *The data (medical history, physical examination, and Hepatitis B profile) was collected from medical records of 740 couples who attended the Premarital Counseling Clinic in Siriraj Hospital between September 2005 and December 2009 for this retrospective study.*

Results: *The prevalence of positive HBsAg in couples who attended the Premarital Counseling Clinic, Siriraj Hospital was 4.2%, which was 3.0% in male and 1.2% in female. The mean age of male was 32.9 $\pm$ 5.1 years old and 30.7 $\pm$ 3.9 years old in female. History of hepatitis B vaccination was found less in male (male 6.1% vs. female 8.8%). Four point two percent of participants were positive HBsAg but negative of HBsAb. Twenty-four couples were at risk or 3.2%. Male gender and history of no hepatitis B vaccination was significantly associated with positive HBsAg. No significant difference was found between age and occupation.*

Conclusion: *The prevalence of positive HBsAg in the Premarital Counseling Clinic, Siriraj Hospital was 4.2%. Male gender and history of no hepatitis B vaccination had significant association with positive HBsAg.*

Keywords: *Hepatitis B infection, Premarital counseling, Premarital clinic*

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Hepatitis B virus (HBV) infection is a public health problem worldwide. The prevalence of HBV carriers has a wide global variation. In Asia, especially Southeast Asian countries, the prevalence is 8 to 15% of population. Thailand is a hyperendemic area for HBV infection; approximately 5 million are chronic HBV carriers[1,2].

For primary HBV infection of adults, 90 to 95% of the subjects can successfully clear the virus through self-limiting hepatitis and only 5 to 10% become chronic HBV carriers. Of children who acquired HBV infection from perinatal transmission, more than 90% develop chronic infection[3]. The other important mode of transmission of HBV is sexual transmission via sexual relationship with infected individuals. Previous studies supported the role of sexual transmission of HBV infection among married couples[4]. Therefore, married couples are one of the target groups for reducing the risk of HBV infection.

The natural course of HBV chronic infection is variable, ranging from an inactive hepatitis B carrier state to a more or less progressive chronic hepatitis, which may potentially evolve to cirrhosis and hepatocellular carcinoma[3].

Solving this problem will require a large amount of money, equipment, and increased numbers of public health personnel. Fortunately, there is a vaccine which is very effective against HBV infection (95% effectiveness)[5].

Previous studies in Thailand revealed the prevalence of Hepatitis B surface antigen (HBsAg) was approximately 8 to 10%[6]. In addition, several studies on the prevalence of HBsAg in Thai voluntary blood donors showed the rates ranging from 6.8 to 8.3%[7], but there was no data in premarital couples.

In the premarital counseling clinic, if the authors can identify the couples at risk for hepatitis B virus infection, such as negative HBsAg and negative

Correspondence to:
Wongwananuruk T, Department of Obstetrics and Gynecology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.
Phone: 0-2419-4657-8
E-mail: sitwn@mahidol.ac.th

HBsAb in one of the couple. The authors can prevent or decrease transmission of HBV to each other by immunization of hepatitis B vaccine.

The purpose of the present study was to determine the prevalence of hepatitis B in Premarital Counseling Clinic at Siriraj Hospital.

Objective

The primary objective was to study the prevalence of hepatitis B in those attending the Premarital Counseling Clinic at Siriraj Hospital. The second objective was to study the associating factors of hepatitis B infection.

Material and Method

The present retrospective study was conducted in Siriraj Hospital with the approval of the institution's ethic committee (COA no. Si 331/2010). The data was collected by reviewing medical records of 740 couples (1,480 participants) who attended the Premarital Counseling Clinic, Family Planning Unit, Department of Obstetrics and Gynecology, Siriraj Hospital, Mahidol University between September 2005 and December 2009. The exclusion criterion was those participants who had incomplete medical data.

Medical records were reviewed about history, physical examination and blood results; complete blood count (CBC), hemoglobin (Hb) typing, hepatitis B surface antigen (HBsAg), anti-hepatitis B surface antigen (anti-HBs), anti-human immunodeficiency virus (anti-HIV) and Venereal Disease Research Laboratory (VDRL). The descriptive statistics were used in determining the prevalence of HBsAg. Chi-square test at a 95% confidence interval and multiple logistic regression analysis were used to determine the significant predictors. The statistical analysis was calculated using the Statistical Packages of the Social Science (SPSS), release 14.0. Statistical significance was considered when a p-value was less than 0.05.

Results

The data was collected from the couples who attended the Premarital Counseling Clinic, Department of Obstetrics and Gynecology, Siriraj Hospital, Mahidol University between September 2005 and December 2009. All participants had good participation and were willing to join in the present study, no loss, and missing data. The prevalence of positive HBsAg in the Premarital Counseling Clinic at Siriraj Hospital was 4.2% (n = 62).

Table 1 shows the baseline characteristics of the participants. Mean age of male was 32.9 years old (SD = 5.1) and mean age of female was 30.7 years old (SD = 3.9). Fifty point one percent of the participants were employees and 73.7% had normal hemoglobin typing. The reactive VDRL was found in five male (0.3%) and two female (0.1%). In addition, the positive anti-HIV was found in one male and two female (0.1%). History of sexual transmitted disease was found in male more than female but history of receiving hepatitis B vaccination was found in female more than male.

Table 2 shows the serological pattern of hepatitis B virus in each participant. The most serological pattern was negative of both HBsAg and HBsAb (885 participants or 59.8%). Five hundred thirty three participants (36%) had negative HBsAg but positive HBsAb and 62 participants (4.2%) were

Table 1. Baseline characteristics in 740 coples

Characteristics	n (%) or mean ± SD	
	Male	Female
Age (yrs old)	32.9 ± 5.1	30.7 ± 3.9
Occupation		
Government official	181 (12.2)	212 (14.3)
State owned official	44 (3.0)	43 (2.9)
Employee	408 (27.6)	363 (24.5)
Business owner	102 (6.9)	77 (5.2)
Housewife	0	26 (1.8)
Others	5 (0.3)	19 (1.2)
Hemoglobin (g/dL)	14.8 ± 1.2	12.8 ± 1.1
Hemoglobin typing		
Normal	542 (36.6)	549 (37.1)
Homozygous HbE	14 (0.9)	7 (0.5)
Heterozygous HbE	105 (7.1)	111 (7.5)
Beta thal trait	21 (1.4)	18 (1.2)
Alpha thal 1 trait	34 (2.3)	29 (2.0)
HbE with alpha thal 1	3 (0.2)	8 (0.5)
Others	19 (1.3)	16 (1.1)
Reactive VDRL	5 (0.3)	2 (0.1)
Positive anti-HIV	1 (0.1)	2 (0.1)
History of STD		
Neisseria gonorrhea	14 (0.9)	1 (0.1)
Herpes simplex	19 (1.3)	10 (0.7)
Hepatitis B	33 (2.2)	5 (0.3)
History of hepatitis B vaccine	91 (6.1)	130 (8.8)

g/dL = gram/deciliter; HbE = hemoglobin E; thal = thalassemia; VDRL = Venereal Disease Research Laboratory; STD = sexual transmitted disease

positive HBsAg but negative HBsAb, which made them at risk of becoming HBV carriers.

Table 3 shows the seroprevalence patterns of HBV infection in couples. The most common pattern was HBsAg-negative, HBsAb-negative in one person of the couple and HBsAg-negative, HBsAb-positive in the other person of the same couple, which were 309 couples (41.8%). The second most common pattern was negative for both HBsAg and HBsAb in couples among 276 couples (37.3%). Twenty-four couples were at risk of HBV infection (3.2%).

Table 4 shows the factors associated with hepatitis B infection. There was a significantly ($p < 0.001$) higher sero-positivity in male more than in female. In addition, history of hepatitis B vaccination had a significantly decreased positive HBsAg prevalence ($p < 0.01$). The HBsAg positive rates were higher in the age group $\geq$ 30 years old, but no statistical significance. The history of gonorrhea infection was associated with higher positive HBsAg rate, but had no statistical significance. Moreover, no significant difference was found among occupation of the participants.

Table 5 shows that history of hepatitis B vaccination is associated with low prevalence of positive HBsAg. Furthermore, male gender had significant association with high prevalence of positive HBsAg.

Table 2. Seroprevalence pattern of hepatitis B virus in each participants (n = 1,480)

Seroprevalence pattern	n (%)
HBsAg-negative/HBsAb-negative	885 (59.8)
HBsAg-negative/HBsAb-positive	533 (36.0)
HBsAg-positive/HBsAb-negative	62 (4.2)

HBsAg = hepatitis B surface antigen; HBsAb = hepatitis B surface antibody

Table 3. The seroprevalence patterns of HBV infection in 740 couples

Patterns of HBsAg infection	n (%)
HBsAg-negative/HBsAb-negative both	276 (37.3)
HBsAg-negative/HBsAb-positive both	94 (12.7)
HBsAg-negative, HBsAb-negative/ HBsAg-negative, HBsAb-positive	309 (41.8)
HBsAg-positive, HBsAb-negative/ HBsAg-negative, HBsAb-positive	37 (5.0)
HBsAg-positive, HBsAb-negative/ HBsAg-negative, HBsAb-negative	24 (3.2)

HBsAg = hepatitis B surface antigen; HBsAb = hepatitis B surface antibody

Discussion

The present study showed that the prevalence of positive HBsAg in couples who attended the Premarital Counseling Clinic, Department of Obstetrics and Gynecology, Siriraj Hospital was 4.2%. This rate was relatively low, compared to previous studies, which showed the prevalence ranging between 6.8 to 8.3%[7]. This may be due to the education level, health awareness, and immunization of hepatitis B vaccine before attendance in our clinic.

Male gender had a higher positive HBsAg rate (6.1%) than female (2.3%), which was the same as previous studies. The previous study in Thai blood donors, Thai female blood donors had lower prevalence of this factor than male blood donors (2.5% vs. 4.2%)[8]. This result was the same trend of study in the personnel of Maharajnakorn Chiang Mai Hospital, which showed male had a higher positive HBsAg rate (12.2%) than female (8.1%)[9].

The reason why male had a higher positive HBsAg rate might be due to some risk behaviors of male such as extramarital sex relations and sexual relation with female sex workers. In addition, male gender had significant association with positive HBsAg ($p < 0.01$) but no association among age, occupation, and positive HBsAg, which was the same as a previous study[10].

The present study thus showed the seroprevalence pattern of HBV infection in couples and each participant. The most significant serologic result of hepatitis B profile in participants was negative of both HBsAg and HBsAb (59.8%). In addition, 4.2% of participants were positive HBsAg but negative HBsAb, the latter of which were at risk for hepatitis B virus carriers. The most common seroprevalence patterns of HBV infection in couples was HBsAg-negative, HBsAb-negative in one person and HBsAg-negative, HBsAb-positive in another one from among 309 couples (41.8%). The couples at risk for transmitted of HBV infection were 24 couples (3.2%), of which one had positive hepatitis B antigen but the another one had no hepatitis B antibody.

The present study found that the participants who should be immunized by hepatitis B vaccine were

Table 4. Factors associate with hepatitis B infection (n = 1,480)

Variables	HBs Ag		95% CI	p-value
	Negative, n (%)	Positive, n (%)		
Age (yrs)				
< 30	469 (97.1)	14 (2.9)	0.925-3.105	0.097
≥ 30	949 (95.2)	48 (4.8)		
Occupational				
government work	375 (95.4)	18 (4.6)	0.502-1.540	0.660
Non-government work	1,043 (96.0)	44 (4.0)		
Gender				
Female	723 (97.7)	17 (2.3)	1.561-4.858	<0.001
Male	695 (93.9)	45 (6.1)		
History of gonorrhea				
No	1,403 (95.8)	61 (4.2)	0.199-11.797	0.498
Yes	15 (93.8)	1 (6.1)		
History of herpes simplex				
No	1,390 (95.9)	59 (4.1)	0.113-6.290	1.000
Yes	28 (96.6)	1 (3.4)		
Contraception				
Condom	517 (95.2)	26 (4.8)	0.474-1.331	0.420
Non-condom	901 (96.2)	36 (3.8)		
Hepatitis B vaccination				
No	1,198 (95.2)	61 (4.8)	0.012-0.647	0.001
Yes	220 (99.5)	1 (0.5)		
Previous sexual intercourse				
No	420 (96.8)	14 (3.2)	0.780-2.628	0.316
Yes	985 (95.4)	47 (4.6)		
Contact prostitutes				
No	476 (94.3)	29 (5.7)	0.674-2.386	0.505
Yes	207 (92.8)	16 (7.2)		
Previous condom use				
No	10 (90.9)	1 (9.1)	0.900-6.290	0.564
Yes	199 (93.0)	15 (7.0)		

* Statistical significance

Table 5. Regression analysis of factors associate with hepatitis B infection

Variable	OR	95% CI	p-value
Gender			
Female	2.615	1.480-4.620	0.001
Male			
History of hepatitis B vaccination			
No	0.097	0.013-0.708	0.021
Yes			

59.8%, for which their immune profile showed both negative for antigen and antibody.

The risk of couples for HBV transmission was 3.2%. They should receive HBV vaccines immediately and use condoms for at least six months. Others sexual transmitted diseases such as syphilis and acquired immunodeficiency syndrome (AIDS) might be eliminated if the couples had blood testing before

getting married. Therefore, the premarital counseling clinic is important to reduce the rate of sexual transmitted infection in the population. Moreover, promoting the Premarital Counseling Clinic in Thailand should be taken into account.

On the other hand, the present study has limitations. This is because the present study design was a retrospective study. Thus, the present study can find only the prevalence of hepatitis B (HBsAg positive). The present study cannot identify the prevalence of hepatitis B carrier because only a single blood sample was collected from the participants. Other blood samples were not taken the hepatitis B profile after six months to identify of hepatitis B carriers. Moreover, the present study collected the data only from the premarital counseling clinic at Siriraj Hospital, so the result did not represent the prevalence of hepatitis B carriers in the Thai population as a whole.

Besides, the prevalence rate of hepatitis B infection in the present study compared with other studies was found to be relatively low (4.2%). This is because the data collected did not categorize the patients who were immunized by hepatitis B vaccines. If these patients were identified, the prevalence of hepatitis B infection might be higher.

Conclusion

According to the present study, the prevalence of hepatitis B (HBsAg-positive) in Premarital Counseling Clinic, Siriraj Hospital was 4.2%. Male gender and history of hepatitis B vaccination had significant correlation with positive HBsAg.

Potential conflicts of interest

None.

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ความชุกของไวรัสตับอักเสบบี ในคลินิกปรึกษาก่อนสมรสที่โรงพยาบาลศิริราช

สุรศักดิ์ อังสุวัฒนา, ธันยารัตน์ วงศ์วนานุรักษ์, กรกฎ ศิริมัย, มานพชัย ธรรมคันโธ, ชลิดา เรารุ่งโรจน์, สรินยา สุขะมงคล

วัตถุประสงค์: *เพื่อศึกษาถึงความชุก และปัจจัยที่สัมพันธ์กับการติดเชื้อไวรัสตับอักเสบบีในคลินิกปรึกษาก่อนสมรสที่โรงพยาบาลศิริราช*

รูปแบบของการวิจัย: *การวิจัยแบบย้อนหลัง*

วัสดุและวิธีการ: *ข้อมูลถูกเก็บจากแฟ้มเวชระเบียนของคู่สมรส 740 คู่ ที่มาตรวจที่คลินิกปรึกษาก่อนสมรสในโรงพยาบาลศิริราช ในระหว่างเดือนกันยายน พ.ศ. 2548 ถึง เดือนธันวาคม พ.ศ. 2552 (ประวัติทางการแพทย์, ผลการตรวจร่างกาย และรูปแบบของการติดเชื้อไวรัสตับอักเสบบี)*

ผลการศึกษา: *ความชุกของการตรวจพบไวรัสตับอักเสบบีในคู่สมรสที่มาตรวจที่คลินิกปรึกษาก่อนสมรสโรงพยาบาลศิริราชคือ ร้อยละ 4.2 โดยพบว่าเป็นเพศชายร้อยละ 3 และเพศหญิงร้อยละ 1.2 อายุเฉลี่ยของเพศชายคือ 32.9 $\pm$ 5.1 ปี และ 30.7 $\pm$ 3.9 ปี ในเพศหญิง ประวัติเคยได้รับวัคซีนป้องกันโรคไวรัสตับอักเสบบีพบน้อยในเพศชาย (เพศชายร้อยละ 6.1 และเพศหญิงร้อยละ 8.8) ร้อยละ 4.2 ของประชากรพบมีผลบวกของ HBsAg แต่มีผลลบของ HBsAb คู่สมรสที่มีความเสี่ยงคือ 24 คู่ หรือ ร้อยละ 3.2 เพศชาย และประวัติไม่ได้รับการฉีดวัคซีนป้องกันมีความสัมพันธ์กับการตรวจพบไวรัสตับอักเสบบี ไม่พบความแตกต่างในปัจจัยของอายุ และอาชีพ*

สรุป: *ความชุกของการตรวจพบไวรัสตับอักเสบบีในคลินิกปรึกษาก่อนสมรสของโรงพยาบาลศิริราชคือ ร้อยละ 4.2 เพศชาย และประวัติไม่ได้รับการฉีดวัคซีน มีความสัมพันธ์กับการตรวจพบไวรัสตับอักเสบบีอย่างมีนัยสำคัญทางสถิติ*