

นิพนธ์ต้นฉบับ

Three-year trend for HBsAg screening in donated blood: National Blood Centre, Thai Red Cross Society.

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Routine screening by reverse passive hemagglutination assay (RPHA) over a three-year period revealed that HBsAg prevalence in all donors decreased slightly from 4% in 1989 to 3.8% in 1990 and 3.7% in 1991. HBsAg prevalence in new male donors was highest (7.5-8.1%) when compared with all donation, all donors and all new donors. The age-adjusted HBsAg prevalence rate by sex and year revealed similar percentages in male donors (4.2-4.3%) during the three-year period, whereas in females the rates were 2.9% in 1989 and 2.5% in both 1990 and 1991. This shows that the HBsAg prevalence rate in blood donors was persistently positive for three years in both sexes and the prevalence in male donors was higher than in female donors.

Key words : HBsAg, prevalence, blood donors.

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ศรีวิไล ตันประเสริฐ, สมร สมจิตต์, ละมุง ปรีชากุล. แนวโน้มผลการตรวจคัดกรองไวรัสตับอักเสบบี ในผู้บริจาคโลหิตในระยะ 3 ปี : ศูนย์บริการโลหิตแห่งชาติ สภากาชาดไทย. จุฬาลงกรณ์เวชสาร 2536 กุมภาพันธ์; 37(2): 111-117

การตรวจโลหิตบริจาคเพื่อคัดกรองไวรัสตับอักเสบบี โดยวิธี *passive hemagglutination assay (RPHA)* ในระยะ 3 ปี ปรากฏผลพบความชุกของ HBsAg ในผู้บริจาคโลหิตทั้งหมดร้อยละ 4 ในปี พ.ศ. 2532, ร้อยละ 3.8 ในปี พ.ศ. 2533 และ ร้อยละ 3.7 ในปี พ.ศ. 2534 สำหรับผู้บริจาคโลหิตชายที่บริจาคครั้งแรกนั้นปรากฏว่าพบความชุกในอัตราสูงสุดคือร้อยละ 7.5-8.1 ซึ่งเป็นอัตราที่สูงกว่าในผู้บริจาคทั้งหมด. ผู้บริจาคใหม่ทั้งหมด และผู้บริจาคชายทั้งหมด อย่างไรก็ตามเมื่อมองในภาพรวมพบว่าอัตราความชุกของการพบ HBsAg ในผู้บริจาคโลหิตทั้งหมด ในระยะ 3 ปี (2532-2534) โดยการคำนวณ *Age-Adjusted HBsAg prevalence rate* พบว่าอัตราความชุกในผู้บริจาคโลหิตชายร้อยละ 4.2-4.3 ในระยะ 3 ปี ส่วนในผู้บริจาคโลหิตหญิงพบร้อยละ 2.9 ในปี 2532 และพบร้อยละ 2.5 ในปี 2533 และ 2534 จากผลการตรวจคัดกรอง HBsAg ในผู้บริจาคโลหิตในระยะ 3 ปี ที่ผ่านมาสรุปลได้ว่า อัตราความชุกของการพบ HBsAg ไม่มีการเปลี่ยนแปลงทั้ง 2 เพศ และเพศชายพบว่ามีค่าความชุกสูงกว่าเพศหญิง

Hepatitis B virus infection is one of Thailand's major public health problems. As previously reported, the HBsAg prevalence rate of the Thai population, in general, is approximately 8-10%.^(1,2)

Bunyagupta et al. reported that 10% of 2,800 persons from Bangkok, Central, North and North-eastern parts of the country were positive for HBsAg. This rate is almost the same in urban areas as in small villages.⁽³⁾ Also Grossman et al. in 1971-1972 studied HBsAg prevalence among a randomly selected sample of households in a low-income housing project in Bangkok; that study revealed that the rate was 8.2%.⁽⁴⁾ The most recent prevalence study among various groups of employees in Bangkok was reported by Nuchprayoon C. et al. They found that the age-adjusted prevalence rate of HBsAg in males was 9.7% and in females 5.1%.⁽⁵⁾ Several studies on the prevalence of HBsAg among Thai volunteer blood donors showed rates ranging from 4.4 to 9.5%.^(1,3,6-11) However, the diagnostic procedure most commonly used was counter immuno-electrophoresis (CIEP); only one study used complement fixation test (CFT).

The objective of this study is to determine a three-year trend of HBsAg in blood donated at the National Blood Centre. Since all blood donors come from the general population of Bangkok and nearby areas, the results of this study most probably reflect only a fraction of the actual prevalence of HBsAg in the general Thai population. As a safeguard in blood transfusion therapy, anti-HIV, anti-HCV, VDRL and HBsAg are screened for routinely by the National Blood Centre. Adequate information about HBsAg is disseminated among the general population to best encourage self-deferral in the blood donors concerned.

Materials and Methods

Screening for HBsAg was performed on volunteers' blood at the National Blood Centre (NBC) from January 1989 through December 1991. There were 137, 553, 139, 208 and 167, 221 volunteers who donated blood to the NBC and its mobile units in 1989, 1990 and 1991, respectively. Donors were healthy males and females, at least 17 years of age, weighing not less than 45 kg, not pregnant, having no history of

hepatitis nor malaria within the past two years, never having been drug addicts, never having been homosexual nor prison inmates, having normal hemoglobin and having had a proper physical check up. Blood collection was performed by trained nurses. Before being distributed every unit of donated blood has to pass several routine screening tests: for example; blood grouping, Rh factor, VDRL, anti-HIV and HBsAg these tests are carried out using reverse passive hemagglutination assay (RPHA). All sera showing positive results by RPHA were retested using RPHA kits obtained from the Green Cross or Mycell Company. Demographic data (age and sex) were collected on the HBsAg-positive donors. Descriptive statistics were used in calculating HBsAg prevalence and in presenting data. The age-adjusted prevalence rate was computed by direct adjustment of the rates.⁽¹²⁾

Results

Total blood donors in 1989, 1990 and 1991 numbered 137,553, 139,208 and 167,221 respectively; the number of new donors was less than that of repeat donors in each of the three years. The majority of donors were male, with the ratio of males to females being in the range of 2.5:1 to 3:1. The 21-30-year-old age group ranked first (42-44%); next was the < 20-year-old age group (26-28%). These two age groups combined accounted for 70-71% of the total (Table 1).

Table 2 shows that HBsAg prevalence in the total number of donors slightly decreased from 4% in 1989 to 3.8% and 3.7% in 1990 and 1991, respectively. In male donors, rates of approximately 4.2% in each of these years whereas in females, prevalence decreased slightly from 2.9% in 1989 to 2.5% in both 1990 and 1991. New male donors had considerably higher HBsAg prevalence, i.e. 7.5%, 8.1% and 7.7% in 1989, 1990 and 1991, respectively. The HBsAg prevalence among new female donors showed more or less the same rate of 4.4-4.1% in 1989, 1990 and 1991. On the other hand, HBsAg prevalence among male repeat donors decreased from 2.5% in 1989 to 1.8% both in 1990 and 1991. There was a slight decrease in prevalence among female repeat donors, from 1.5% in 1989 to 0.8% in both 1990 and 1991. HBsAg prevalence among repeat donors was lower than in the first two groups.

Table 1. General characteristics of blood donors during 1989-1991.

Year	1989	1990	1991
Characteristics	Number	Number	Number
Total donors	137,553	139,208	167,221
New donors	54,983	57,186	74,355
Repeat donors	82,570	82,022	92,866
Sex : Male	102,765	103,035	119,689
Female	34,788	36,173	47,532
Sex ratio : M : F	3:1	2.8:1	2.5:1

Age group (years)	Percent (n = 137,553)	Percent (n = 139,208)	Percent (n = 167,221)
< 20	27.2	28.4	25.8
21 - 30	43.5	41.8	43.7
31 - 40	19.4	19.3	20.0
41 - 50	7.5	7.8	7.9
51 - 60	2.2	2.5	2.4
60	0.1	0.1	0.1
Unspecified	0.1	0.1	0.1
Total	100.0	100.0	100.0

Table 2. Prevalence of HBsAg by sex in blood donors during 1989-1991.

	1989		1990		1991	
	No. test	% HBsAg	No. test	% HBsAg	No. test	% HBsAg
All donors	137,553	4.0	139,208	3.8	167,221	3.7
Male	102,765	4.3	103,035	4.2	119,689	4.2
Female	34,788	2.9	36,173	2.5	47,532	2.5
New donors	54,983	6.5	57,186	6.9	74,355	6.5
Male	37,813	7.5	39,602	8.1	49,873	7.7
Female	17,170	4.4	17,584	4.3	24,482	4.1
Repeat donors	82,570	2.2	82,022	1.6	92,866	1.5
Male	64,952	2.5	63,433	1.8	69,816	1.8
Female	17,618	1.5	18,589	0.8	23,050	0.8

Table 3 HBsAg prevalence in various groups of blood donors in the period 1989-1991. It was highest in new male donors when compared with all donations, all donors and all new donors. However, there was little change in HBsAg prevalence during 1989, 1990 and 1991 in the various groups of donors.

The age-adjusted prevalence rate in total

donors showed slightly differences; i.e. 3.97%, 3.77% and 3.72% in 1989, 1990 and 1991, respectively (Table 4). The age-adjusted prevalence rate by sex and year revealed similar percentages among male donors (4.2-4.3%) during the three-year period, whereas in female donors it was 2.9% in 1989 and 2.5% in both 1990 and 1991 (Figure 1).

Table 3. Summary of prevalence of HBsAg in blood donors during 1989-1991.

	1989 % HBsAg	1990 % HBsAg	1991 % HBsAg
All donations	2.6	2.4	2.4
All donors	4.0	3.8	3.7
All new donors	6.5	6.9	6.5
All male donors	4.3	4.2	4.2
New male donors	7.5	8.1	7.7

Table 4. Prevalence of HBsAg by age group in total donors.

Age group (years)	1989		1990		1991	
	No. tested	% HBsAg	No. tested	% HBsAg	No. tested	% HBsAg
All ages	137,553	4.0	139,208	3.8	167,221	3.7
< 20	37,381	9.0	39,462	3.4	43,100	3.4
21 - 30	59,793	1.3	58,216	4.9	73,179	4.7
31 - 40	36,737	4.6	26,821	2.8	33,441	3.0
41 - 50	10,367	0.7	10,833	1.9	13,188	1.9
51 - 60	3,100	0.3	3,475	1.6	3,979	1.3
> 60	110	0.9	160	0.0	184	0.0
Unspecified	65	0.0	196	0.0	150	0.0
Age-adjusted prevalence rate (%)		3.97		3.77		3.72

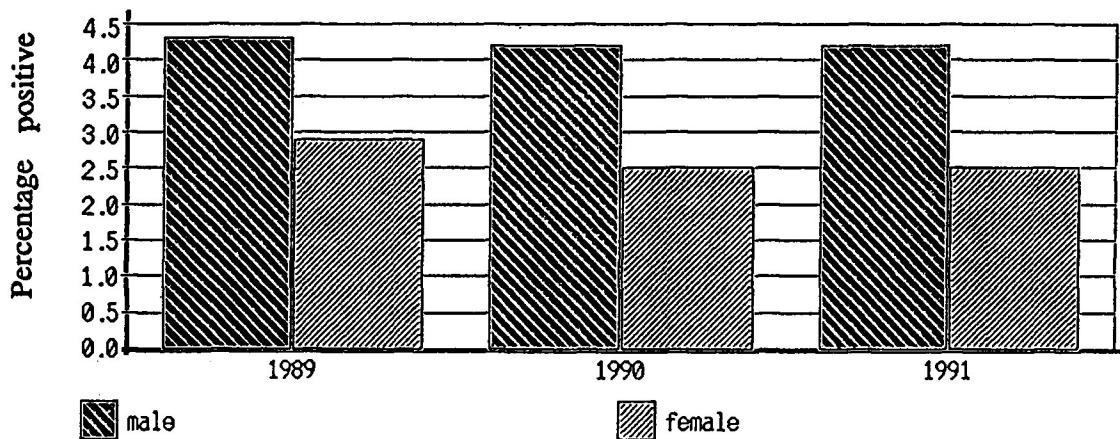


Figure 1. Age-adjusted prevalence rate (%) of HBsAg by sex in total blood donors during 1989-1991. Age-adjusted

Discussion

People donating blood at the National Blood Centre and its mobile units in Bangkok and nearby areas are healthy. A study of the characteristics of such donors during the years 1989-1991 indicated that most of donors were male, i.e. almost three times as many males than females; they ranged in age from < 20 to 30 years (70-71% of the total). HBsAg screening has been a standard practice of the National Blood Centre since 1974. Eight previous studies of HBsAg prevalence among blood donors from several studies using counter immuno-electrophoresis found the rate to be 9.5%.^(1,3,6-11) These previous studies were carried out during the period 1971-1983. The prevalence rate now shows a marked decrease, i.e. from 9.5% during that earlier period to 3.7% for all donors in 1991. Male donors, especially all new male donors (7.7% in 1991) had a higher HBsAg prevalence rate than female. The HBsAg prevalence rate found in this study is similar to that in Brunei where the rate among blood donors was 3-5% annually from 1983 to 1988.⁽¹³⁾ In the Philippines,⁽¹⁴⁾ the prevalence rate among volunteer blood donors (units) was 13.5% and among professional blood donors (units) it was 13.7%, which is much higher than among Thai blood donors. Nonetheless, the HBsAg prevalence rate among Thai blood is still much higher than in western countries. Wolf Szmunes et al. reported that 1.5 volunteer blood donors per 1,000 (0.15%) from the New York metropolitan area were carriers of the hepatitis B antigen.⁽¹⁵⁾ Also John W. Singleton et al. reported that during a six-month

period, 20,304 units of blood donations were screened, of which 0.23% were HBsAg positive.⁽¹⁶⁾ When attempting to determine the three-year trend of HBsAg prevalence among blood donors in this study, we concluded that the prevalence rate was more or less the same during the three years from 1989 through 1991 in both male and female donors. This finding indicates that the incidence of hepatitis B infection in Thais has decreased owing partly to the increase in the prevalence rate of anti-HBs. Nuchprayon C et al. tried to determine the prevalence of hepatitis B in various groups of employees in Bangkok; the results revealed that the prevalence rate of anti-HBs in males was 43.9% and in females 39.3%.⁽⁵⁾ Also evidence of increased use of hepatitis vaccine among the general Thai population will certainly have a favorable effect on the incidence of hepatitis B infection. Since the prevalence of HBsAg in male donors is higher than that of females, the present study shows that the age-adjusted HBsAg prevalence rate in males was 4.2-4.3% during 1989-1991 whereas in females it was 2.9% in 1989 and 2.5% in both 1990 and 1991. According to the study of Grossman et al. in 1971, the age-adjusted prevalence rate of HBsAg in males was 9.8% and in females 7.0%, which also showed that the prevalence rate among males is higher than among females.⁽⁴⁾ The study of Nuchprayon C et al. reported that the age-adjusted prevalence rate of HBsAg in males was 9.7% and of females 5.1%. Even though these two studies were performed 17 years apart, there was no significant difference in the results of the two studies. The present study confirmed that the prevalence

rate of HBsAg in males is higher than in females. Male may be at higher risk of contacting HBV than females, possibly via a sexually transmitted route. Even though the incidence of HBsAg in Bangkok and nearby areas is lower in both sexes when compared with previous studies, the rate is still much higher than in the western countries. The information about HBsAg from this study will be given to the Ministry of Public Health in order to encourage greater effort in campaigns aimed at the prevention of hepatitis B infection, and to encourage self-deferral among blood donors in order to safe-guard blood tranfusion therapy of the National Blood Centre, Bangkok.

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