TRENDS IN HEPATITIS B VIRUS INFECTION AMONG BLOOD DONORS IN KELANTAN, MALAYSIA : A RETROSPECTIVE STUDY

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Abstract. The objective of this study was to determine the prevalence and trends in hepatitis B infection among blood donors attending the Transfusion Medicine Unit at the Hospital Universiti Sains Malaysia, Kelantan, Malaysia. A retrospective study was carried out by reviewing the results of HBsAg among blood donors for the years 2000 to 2004. During this period, 44,658 blood donors were studied. We noted that there was a significant difference in the prevalence of hepatitis B infection between regular and first time donors. There was also a decreasing trend noticed in both study groups. The mean prevalence was significantly different between first time (1.83%) and regular donors (0.45%) ($p<0.005$). There is a need to improve public awareness programs to lower the incidence of hepatitis B infection in the general population and consequently first time blood donors. Future studies are also required to determine the trends and outcomes of these programs.

INTRODUCTION

Hepatitis B infection is a public health concern because it results in chronic infection, liver cirrhosis and hepatocellular carcinoma (Lee, 1997; Arankalle *et al,* 2003). Hepatitis B virus was one of the major causes of post-transfusion hepatitis, though the introduction of serological screening tests for hepatitis viruses caused a significant reduction in infection (Germin and Goldman, 2002; Bashawri *et al,* 2004). It is readily transmitted vertically, and through sexual and parenteral routes. It is estimated that 360 million people are carriers of HBV in the world accounting for one million deaths annually as a consequence of liver disease (Lee, 1997).

In Malaysia 2.4 million people who are carriers of hepatitis B continue to be a source of infection in the community (Malaysian Liver Foundation, 2005). The aim of this study was to determine the prevalence and trends in hepatitis B infection among blood donors in Kelantan, Malaysia. The results of this study should help in making long term strategies to improve public health and to prevent further transmission of the disease in the local population.

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MATERIALS AND METHODS

Subjects

This retrospective study was performed at the Transfusion Medicine Unit at the Hospital Universiti Sains Malaysia by reviewing the screening test results for HBsAg. Data was collected from 44,658 voluntary blood donors between the years 2000 and 2004 after

selection of donors by qualified medical personnel based on medical history and physical examination. Blood samples were taken for serological testing. HBsAg was tested using microparticle enzyme immunoassay (MEIA: the AxSYM System, Abbot Diagnostic). All positive results were repeated twice.

Analysis

The gender and race of blood donors were recorded. Data for serological tests were presented as number (%) of subjects with a positive HBsAg test in regular and first time donors. Comparison was made between the two groups by doing a *t*-test.

RESULTS

Males comprised 84.9% of donors and females 15.1%. Of these donors, 81.3% were Malay, 14.1% were Chinese, 1.3% were Indians and 3.4% were of other races, (Table 1). The mean prevalences of hepatitis B infection among first time and regular blood donors were 1.8% and 0.4%, respectively. The yearly incidences of hepatitis B infection among first time and regular donors are presented in Table 2. The trends in hepatitis B infection for both groups are shown in Fig 1.

Hepatitis B infection in Malays was 1.2%, Chinese 0.5%, Indians 0.2% and in other races 0.9% (Table 3). Among genders, 1.2% of males and 0.4% of females were positive for HBsAg (Table 4).

DISCUSSION

In this study, the prevalence of HBsAg positivity in regular and first time donors was 1.1%. This was a significantly lower prevalence of hepatitis B infection in regular and first time donors compared to an earlier study in 1997 in a different population group which showed the prevalence of HBsAg in healthy volunteers was 5.2% (Malaysian Liver Foundation, 2005).

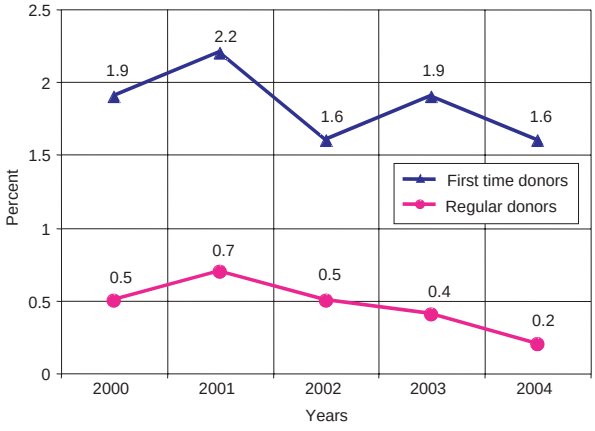

Fig 1–Trends in hepatitis B infection among the blood donors in Kelantan, Malaysia for the years 2000 to 2004.

Table 1
Gender and race distribution of the study population for the years 2000-2004.

	2000 n (%)	2001 n (%)	2002 n (%)	2003 n (%)	2004 n (%)	Total n (%)
Gender						
Male	6,395 (86.9)	6,998 (88.8)	8,508 (86.0)	7,666 (84.3)	8,339 (80.0)	37,906 (84.9)
Female	967 (13.1)	886 (11.2)	1,390 (14.0)	1,422 (15.6)	2,087 (20.1)	6,752 (15.1)
Race						
Malay	6,132 (83.3)	6,545 (83.0)	8,097 (81.8)	7,162 (78.8)	8,353 (80.1)	36,289 (81.3)
Chinese	971 (13.2)	1,029 (13.0)	1,347 (13.6)	1,424 (15.7)	1,527 (14.6)	6,298 (14.1)
Indians	97 (1.3)	104 (1.3)	123 (1.2)	130 (1.4)	109 (1.0)	563 (1.3)
Others	162 (2.2)	206 (2.6)	331 (3.3)	372 (4.1)	437 (4.2)	1,508 (3.4)

Table 2
Prevalence of hepatitis B infection among first time and regular blood donors of Kelantan, Malaysia; 2000-2004.

Year	First time blood donors(n)	Number of infected donors with hepatitis B virus, n (%)	Regular blood donors (n)	Number of infected donors with hepatitis B virus, n (%)	p-value
2000	3,568	68 (1.9)	3,794	19 (0.5)	
2001	3,807	85 (2.2)	4,077	27 (0.7)	
2002	4,904	81 (1.6)	4,994	25 (0.5)	p<0.005
2003	4,119	79 (1.9)	4,969	22 (0.4)	
2004	4,990	80 (1.6)	5,436	13 (0.2)	
Total	21,388	393 (1.8)	23,270	106 (0.4)	

Table 3
Prevelance of hepatitis B infection among different races for the years 2000-2004.

Year	Malay, n (%)	Chinese, n (%)	Indians, n (%)	Others, n (%)
2000	79 (1.3)	5 (0.5)	0	3 (1.8)
2001	100 (1.5)	7(0.7)	0	5 (2.4)
2002	96 (1.2)	8 (0.6)	0	2 (0.6)
2003	92 (1.3)	9 (0.6)	0	0
2004	86 (1.0)	3 (0.2)	1 (0.9)	3 (0.7)
Total	453 (1.2)	32 (0.5)	1 (0.2)	13 (0.9)

Table 4
Prevalence of hepatitis B infection among different gender for the years 2000-2004.

Year	Male, n (%)	Female, n (%)
2000	84 (1.3)	3 (0.3)
2001	106 (1.5)	6(0.7)
2002	101(1.2)	5 (0.4)
2003	98 (1.3)	3 (0.2)
2004	85 (1.0)	8 (0.4)
Total	474 (1.2)	25 (0.4)

The lower prevalence may be explainable by the fact that the earlier study was done on healthy volunteers in the general population. Our study population was a pre-selected group of people supposed to have few risk factors, causing a lower incidence of certain diseases among them. According to another study in Malaysia during the years 1997-1999 which included university students, health care workers and primary and secondary school students, the overall prevalence of HBsAg was 1.5% (Hong *et al,* 2001). This value is slightly higher than our study findings which again reflects the higher value in the general population. There are no published data regarding the prevalence rate of HBsAg among blood donors in Malaysia.

The prevalence of hepatitis B among blood donors in the UK and USA varies from 0.1% to 1%. A higher prevalence has been observed in Southeast Asians and in the Indian subcontinent. (Rehman *et al,* 1996; Alter *et al,* 1999). The prevalence rate among blood donors in Thailand was found to be 6.5% (Tranprasert and Somjitta, 1993), in Vietnam 3% (Song *et al,* 1994) and in India about 1.2%-

3.2% (Deodhor, 1998), in Pakistan 2% (Akhtar *et al,* 2005), and in Saudi Arabia 3.3% to 4% (Altamimi *et al,* 1998; Ahmed and Panhotra, 2001). Compared with those Asian countries, the Malaysian prevalence (1.1%) is lower.

The trend study revealed that HBsAg incidence fluctuated in first time donors, however, there was an overall decreasing trend. The decline could be due to increased awareness, a low prevalence among the general population and/or strict donor selection criteria. Strict pre-donation counseling and donor selection criteria have been implemented at the Transfusion Medicine Unit since the year 2004. Further follow-up studies should show whether the trend is changing.

This study showed that the prevalence of HBsAg among the different races was highest among the Malay population (1.2%) and was lowest in the Indian population (0.2%). Chinese blood donors were found to have 0.5% HBsAg positivity. One study among the general population in Malaysia showed that in both Malays and Chinese, HBsAg prevalence was 1.5% while in Indians it was 0.3% (Hong *et al,* 2001). These studies showed that Indians had a lower prevalence than Malays and Chinese among the general population and blood donors.

In our study, male donors had a HBsAg positivity of 1.2% and females positivity of 0.4%. The majority of our donors were males. These results highlight the importance of awareness and prevention programs for male subjects to ensure a safe blood supply.

In conclusion, public awareness, educational and motivational programs with vaccination can further reduce the incidence of hepatitis B infection. Nucleic acid testing (NAT) can be introduced to decrease the risk of transmission of virus during the seronegative window period for safe blood transfusion. There is a need to conduct further studies to see the future trends.

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