SEROPREVALENCE OF HEPATITIS B, HEPATITIS C, CMV AND HIV IN MULTIPLY TRANSFUSED THALASSEMIA PATIENTS: RESULTS FROM A THALASSEMIA DAY CARE CENTER IN MALAYSIA

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Abstract. Regular blood transfusions for patients with thalassemia have improved their overall survival although these transfusions carry a definite risk of the transmission of certain viruses. Infection with hepatitis B virus (HBV), hepatitis C virus (HCV), cytomegalovirus (CMV) and human immunodeficiency virus (HIV) leads to complications which contribute to the morbidity and mortality of patients with thalassemia. We analyzed the blood samples taken from 85 transfusion dependent thalassemics receiving treatment at the day care center in Hospital Universiti Kebangsaan Malaysia and found that the seroprevalence rates for HBV, HCV and CMV were 2.4%, 22.4% and 91.8% respectively. None of the patients tested positive for HIV. Those positive for HBV and HCV will require further tests and treatment if chronic hepatitis is confirmed.

INTRODUCTION

Thalassemia is an important health problem in Malaysia with an estimated number of 2,000 transfusion dependent thalassemia patients throughout the country. Although regular blood transfusions have significantly improved the survival of these patients, transfusion related complications remain as important causes of death and morbidity. One of these complications is the transmission of transfusion related viral infections, such as hepatitis B, hepatitis C, cytomegalovirus and human immunodeficiency viruses, through the blood and blood products (de Montalembert *et al,* 1995). The screening and monitoring of thalassemics for the presence of these viruses are considered crucial to affect the optimal management in these patients. For example, those who have chronic hepatitis B and C can be offered treatment with alpha-interferon (Di Bisceglie *et al,* 1989).

The aim of this study was to ascertain the seroprevalence of hepatitis B (HBV), hepatitis C (HCV), cytomegalovirus (CMV) and the human immunodeficiency virus (HIV) amongst transfusion dependent thalassemics in the local setting. We report here the results of our cross-sectional study performed during the months of October to December 1997, on 85 transfusion dependent thalassemics attending the daycare center at the Hospital Universiti Kebangsaan Malaysia (HUKM), Kuala Lumpur, Malaysia.

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MATERIALS AND METHODS

All 85 thalassemia patients who are on regular blood transfusions at least every 2-8 weeks at the HUKM thalassemia day care center were recruited into this study. Informed consent was taken from the parents and from patients who are above 18 years of age. The patients' blood samples were taken and the following tests were performed using standard methods.

Serological studies: The serological analyses were performed in the Virology Unit, Department of Microbiology, Hospital Universiti Kebangsaan Malaysia. Anti-HCV antibodies were screened using a third generation ELISA assay (Abbott Diagnostics) whilst the HBsAg, anti-HBs and anti-HIV antibodies using a quantitative third generation microparticle enzyme immunoassay (Abbott Diagnostics). Cytomegalovirus-IgG was screened using an ELISA assay (Abbott Diagnostics).

Statistical analysis: The data was entered and analyzed using the Epi-Info6 software. The seroprevalence for infection by each virus was calculated.

RESULTS

The demographic data of the 85 patients included in this study is shown in Table 1. There were 41 male (48.2%) and 44 female (51.8%) patients. Forty-seven patients were Malays, 37 Chinese and one Indonesian. Thirty-six patients were between 1-10 years, 47 between 11-20 years and 2 above twenty years of age. Fifty-two patients have beta-thalassemia major whilst the other 33 patients have HbE-beta thalassemia.

The seroprevalence of HCV, HBV, CMV and HIV amongst this group of 85 multiply transfused thalassemics is shown in Table 2. Nineteen out of the 85 patients (22.4%) screened had positive anti-HCV antibodies. Two of the 85 patients tested positive for HBsAg and fifty patients had antibodies to HBsAg. CMV IgG was positive in 78 patients (91.8%) whilst none tested positive for HIV.

Table 1

Sociodemographic characteristics of 85 multiply transfused thalassemia patients screened for transfusion related viral infections.

Characteristic	No. of patients (n = 85)	(%)
Sex		
Male	41	48.2
Female	44	51.8
Race		
Malay	47	55.3
Chinese	37	43.5
Indonesian	1	1.2
Age group (years)		
1 - 5	10	11.8
6 - 10	26	30.6
11 - 15	29	34.1
16 - 20	18	21.2
> 20	2	2.4
Diagnosis		
β- Thalassemia major	52	61.2
HbE β- Thalassemia	33	38.8

Table 2

Seropositivity of HBV, HCV, CMV and HIV in 85 multiply transfused patients.

Serology test	No. of positive results	(%)
Anti-HCV	19	22.4
HBsAg	2	2.4
Anti-HBsAg	50	58.8
CMV IgG	78	91.8
Anti-HIV 1 and 2	0	0

DISCUSSION

This study is the most comprehensive to date on ascertaining the seroprevalence of transfusion related viral infections amongst a group of thalassemics in Malaysia. One of the most revealing data is the fact that 22.4% of the patients studied tested positive for anti-HCV antibodies. An earlier study performed in 1993 revealed a prevalence of 5.8% amongst the local thalassemics (Isahak *et al,* 1993). The investigators analyzed a much smaller number of patients using the first generation ELISA assay which is less sensitive than the current third generation ELISA assays as used in our study. Studies from other countries where thalassemia is a common public health problem showed varying rates of HCV seropositivity. For example, Egypt, Italy and India have seroprevalence rates of 75%, 44%, and 16.7% respectively whilst a recent study from Thailand revealed a seroprevalence rate of 23.8% which is comparable to that obtained from our study (el-Nanawy *et al,* 1995; Rebulla *et al,* 1992; Agarwal *et al,* 1993; Laosombat *et al,* 1997).

The risk of acquiring HCV infection is believed to be dependent on the prevalence of HCV amongst blood donors, hence blood and blood donors are now routinely screened for HCV. Studies have shown that the use of the second generation anti-HCV screening tests on blood donors can successfully reduced the incidence of post-transfusion hepatitis from 13.8% to 2.7% (Huang *et al,* 1994). In Malaysia, a study performed in 1993 revealed that 1.49% of our blood donors were positive for anti-HCV antibody and this later led to the routine local screening of blood and blood products for HCV in 1995 (Duraisamy *et al,* 1993). We found that all the 19 patients who have positive anti-HCV antibodies started receiving regular blood transfusions prior to 1995, suggesting that HCV screening in blood do-

nors could prove vital in the prevention of HCV infection.

Positivity for anti-HCV antibodies does not equate to active infection as there is the possibility of false positivity. The radio-immunoblot assay (RIBA) which has a higher specificity is not widely available locally at this moment. We are however in the process of analyzing the HCV-RNA status in these 19 patients.

Only two patients were positive for HBsAg, giving a seroprevalence rate of 2.4%. This is comparable to the rates from other countries, for example 2.5% in France and 5% in Italy (de Montalembert *et al,* 1992). Our results also indicate that only 58.8% of the patients tested had positive anti-HBsAg. The rest of the patients should be vaccinated.

Seventy-eight out of the 85 patients (92%) tested positive for CMV-IgG. This is much higher than in other countries and the reason for this may be that our blood donors are not routinely screened for the CMV-IgG as the prevalence of CMV in our general population is estimated at >50%. It is reassuring to note that none of the patients tested positive for HIV.

In summary, this study performed in a typical thalassemia day care center in Malaysia has revealed the seroprevalence data of transfusion related viral infections amongst the thalassemics and has implications in the routine screening of such patients as well as in the management of those found positive for the respective viruses.

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