



Prevalence of Hepatitis B and Hepatitis C Infections among Multi-transfused Thalassaemic Patients

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ABSTRACT

Objective: Therefore this study was aimed to determine the prevalence of Hepatitis B and C infections among the multi-transfused Thalassaemic patients. **Methodology:** The medical records of total 100 patients with thalassaemia attending the Day Care Ambulatory Unit for blood transfusion in Raja Permaisuri Bainun Hospital was collected in order to extract relevant information pertaining to the study. **Results:** Among the 100 multi-transfused thalassaemic patients, 48% were females and 52% were males. 24% was infected with viral hepatitis, among them 18% by Hepatitis C, 4% by Hepatitis B, and only 2% were infected by both Hepatitis B & C. Difference in occurrence of hepatitis in different gender groups was not significant, on the other hand difference in occurrence of hepatitis in different ethnic groups was highly significant. **Discussion and Conclusion:** Acquisition of hepatitis C as well as hepatitis B is a serious risk for multi-transfused thalassaemia patients. Blood screening in Malaysia has significantly reduced the risk of hepatitis B and C associated with blood transfusion. However, the risk is still there. So, the health care providers who are involved with the management and providing blood transfusion to the thalassaemic patients should be aware of this problem, and should pay more attention to prevent these known complications.

Key words: Blood transfusion, Hepatitis B, Hepatitis C, Thalassaemia.

INTRODUCTION

Thalassaemia is an inherited impairment of haemoglobin production which is generally prevalent in populations of humid climates but affects all races.¹ It causes profound hypochromic anaemia, requiring lifelong blood transfusions which is never free from the vulnerabilities of repeated blood transfusion.²⁻⁸ The highest incidence of thalassaemia in the world with a carrier rate of 18% was reported in Maldives, 16% in Cyprus, 1% in Thailand and 3-8% in Bangladesh, China, India, Malaysia and Pakistan.^{9,10} Like many other countries, thalassaemia is also an important public health problem in Malaysia.¹¹ An approximately 4.5% of Malaysians are carriers of β -thalassaemia, and the affected births annually are estimated at 2.1 per 1,000 with an estimated 5,600 patients with transfusion dependent β -thalassaemia.^{11,12} Unfortunately, the vast majority of them

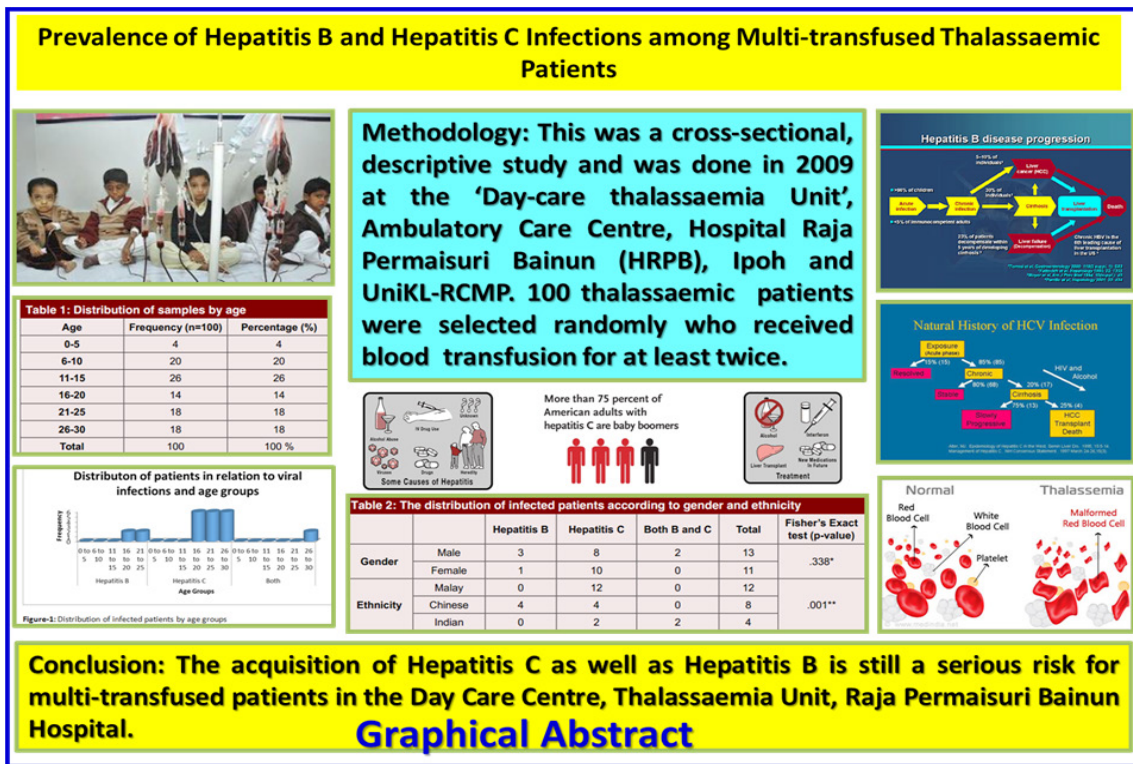
are unaware of their carrier/thalassaemia minor status.^{13,14} Regular blood transfusion in patients with thalassaemia, improves their overall survival, but carries a definite risk of acquisition of blood-borne virus infections, especially viral hepatitis.^{15,16}

Hepatitis B viral infection affects 350 million people and is one of the most common causes of chronic liver disease and hepatocellular carcinoma world-wide.¹⁷ Hepatitis C is transmitted mainly via blood and saliva, and is also known as 'non-A-non-B hepatitis', a syndrome of acute hepatitis often with jaundice seen after a transfusion of blood or blood products.¹⁸ Nowadays, vaccination against hepatitis B has efficiently been able to restrict the transmission of hepatitis B virus infection.^{19,20} However, post-transfusion transmission of hepatitis C virus has still remained a major health concern in Thalassaemic patients.²¹ Hepatitis C is accountable for 80-90% of post-transfusion hepatitis in patients who received blood transfusion prior to the introduction of routine blood products screening in 1990.¹⁵ The prevalence of hepatitis C viral infection among the Thalassaemia patients has been reported to be up to 60% in Italy,²² although the compulsory screening of donated blood has decreased the incidence of both post-transfusion hepatitis B virus and hepatitis C viral infections.²³ Chronic hepatitis C has been indicated as a progressive disease that dramatically increases the morbidity and

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Graphical Abstract

mortality rates among these patients due to liver failure or hepatocellular carcinoma.^{15,18,24,25}

In a similar research in Iran, 19.3% patients were found HCVAb positive and 1.5% HBsAg positive.²⁶ A study done in Bangladesh revealed that the HBV and HCV-markers were found significantly more often among multi-transfused Thalassaemic children than among the controls in terms of HBsAg (13.8% vs 6.55%, p<0.04), anti-HBc total (39.5% vs 9.4%, p<0.0001), and anti-HCV (12.5% vs 0.9%, p<0.0001).²⁷ In Egypt HCV antibodies were positive 45%.²⁸ In Arab world such prevalence was found to be high among the risk groups such as haemodialysis patients where it ranged from 18.6 to 56%, 40% among the haemophilia patients, and 94.8% among IVDs.²⁹

The magnitude of hepatitis infections among Thalassaemic patients in Malaysia, who are receiving regular blood transfusions, is not well-known and accurate data in this area of research is still lacking compared to developed countries and several developing countries. Therefore, the purpose of this study was to determine the prevalence of hepatitis B and C viral infections among the multi-transfused Thalassaemic patients.

MATERIALS AND METHODS

It was a cross-sectional, descriptive study and was done in 2009 at the 'Day-care Thalassaemia Unit', Ambulatory Care Centre, Hospital Raja Permaisuri Bainun (HRPB), Ipoh and UniKL-RCMP. 100 thalassaemia patients were selected randomly who received blood transfusion for at least twice. The patients who were diagnosed positive for hepatitis B and/or C infection prior to blood transfusion, and the patients who received blood transfusion only once were excluded from the study.

A data collection sheet was prepared to collect the data from the medical records of the patients available in the database of the hospital. The demographic (age, sex and ethnicity) information and the information on the positive findings on hepatitis B and hepatitis C were included in the data collection sheet. Patients' identity was not revealed and the strict confidentiality was maintained at all levels. The study was registered with Malaysia's National Medical Research

Register (NMRR) and the ethical clearance was taken from the 'HRPB Ethical Committee'. The data was then entered and proportion analysis was done by using SPSS version 15.0.

RESULTS

The records of one hundred multitransfused thalassaemia patients were examined, among which 52% were male and 48% female. 62% of them were Malay, 32% Chinese and 6% were Indian. The age distribution of the patients is shown in the (Table 1). Twenty four of the 100 patients were found infected, of them 4 were infected by hepatitis B virus, 18 by hepatitis C and 2 with both hepatitis B and hepatitis C viruses. The patients who were infected by hepatitis B belonged to the age group 16-25, hepatitis C to the 16-30 age groups and by both hepatitis B & C were 26-30 age group (Figure 1). Among the male patients, 8 were positive for hepatitis C; 3 for Hepatitis B, and 2 were for both. Among the female patients, 10 were positive for hepatitis C, only 1 was for hepatitis B, and none was infected by both type of virus (Table 2).

Among the infected multi-transfused Thalassaemic patients, only 4% of the infected patients with hepatitis B were Chinese; whereas the distribution of the hepatitis C infected cases were 12% Malays, 4% Chinese and 2% Indian. 2% of the patients who were infected by both type of viral hepatitis were Indian. (Table 2).

Table 1: Distribution of samples by age

Age	Frequency (n=100)	Percentage (%)
0-5	4	4
6-10	20	20
11-15	26	26
16-20	14	14
21-25	18	18
26-30	18	18
Total	100	100%

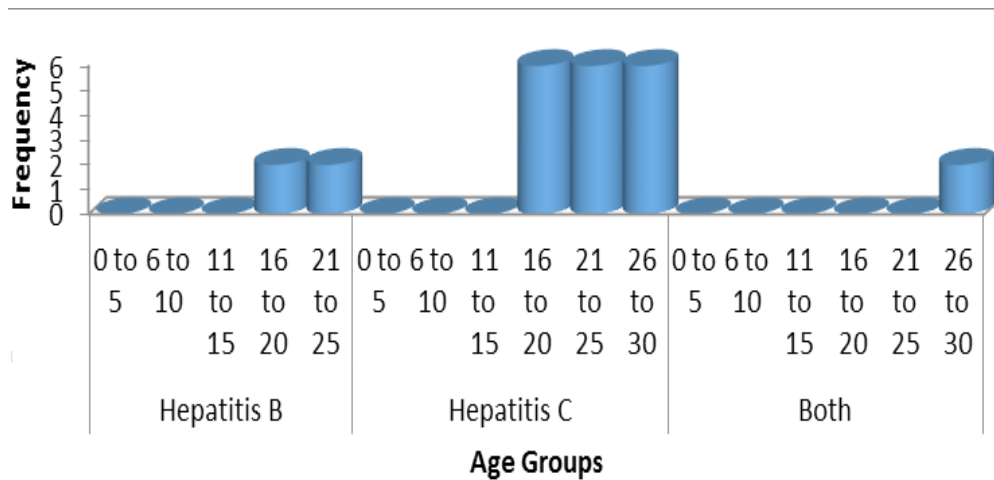


Figure 1: Distribution of infected patients by age groups

		Hepatitis B	Hepatitis C	Both B and C	Total	Fisher's Exact test (p-value)
Gender	Male	3	8	2	13	.338*
	Female	1	10	0	11	
Ethnicity	Malay	0	12	0	12	.001**
	Chinese	4	4	0	8	
	Indian	0	2	2	4	

*Difference in occurrence of hepatitis in different gender groups was not significant. **Difference in occurrence of hepati.

DISCUSSION

Blood transfusion is still the basis of treatment for patients with thalassaemia that pushes them with an increased risk of transfusion-transmitted viral hepatitis infections. Since the magnitude of concern is always an issue, with the application of improved technology and universal screening process, the risk is reduced but surely it is there.

In this study, 4% of the thalassaemic patients were found hepatitis B positive, which is higher than that reported from various studies in Iran (1.5%) and Jordan (3.5%). However, the studies conducted in early 1990s showed a much higher prevalence of Hepatitis B positive. These varied findings might be due to the sensitivity of screening tests and the status of the virus. In addition, active immunization against HBV among thalassaemic children might have contributed to the prevalence of lower Hepatitis B infection.

Hepatitis C infection was observed to be 18% which is within our expectation since hepatitis C virus is known to be the most commonly encountered blood-transmitted hepatitis infection among chronically transfused patients in developing countries. This number was higher compared to those infected with hepatitis B, which could be due to non-availability of any vaccine yet against hepatitis C³⁰ in India, in Pakistan³¹ and in Iran²⁶ also reported to have found high prevalence of hepatitis C infection. Although the screening programme of the blood products have been improved a lot compared to the previous days, but the chances of infection are not less because this virus is more complicated to handle as it has a longer convalescence phase than hepatitis B virus.

Two per cent of the thalassaemic patients had concurrent infection with both HBV and HCV.³² Concomitant infection of both HBV and HCV has ominous implications in the pathogenesis of chronic viral hepatitis, leading to rapid progression towards cirrhosis of the liver. Therefore, preventive measures, especially HBV vaccination to all the children with thalassaemia and to those suffering from HCV, and screening of blood/blood products should strongly be considered.

In this study, frequency of transfusion was identified as a risk factor for both hepatitis B and hepatitis C infection since all those who are infected were chronically blood-transfused. This study also showed that 100% of the infected thalassaemic patients became infected in the later part of their life. Therefore it gives us a very clear picture that the infection occurred only after receiving multiple blood transfusions.

Since this study was based on data from a limited number of samples from only one centre, a bigger scale research can be carried out in order to come across more precise information on this area of concern.

CONCLUSION

The acquisition of Hepatitis C as well as Hepatitis B is still a serious risk for multi-transfused patients in the Day Care Centre, Thalassaemia Unit, Raja Permaisuri Bainun Hospital. Blood screening initiated in 1995 in Malaysia has been known as a main factor that has significantly reduced the risk of transfusion related hepatitis B and C. However, the risk is still there. So, the health care providers who are involved in the management and blood transfusion of thalassaemic patients should be more aware of this problem, and pay more attention to prevent these known complications.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

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Highlights of Paper

- Twenty four of the 100 patients were found infected, of them 4 were infected by hepatitis B virus, 18 by hepatitis C and 2 with both hepatitis B and hepatitis C viruses.
- The patients who were infected by hepatitis B belonged to the age group 16-25, hepatitis C to the 16-30 age groups and by both hepatitis B & C were 26-30 age groups.
- Among the male patients, 8 were positive for hepatitis C; 3 for Hepatitis B, and 2 were for both. Among the female patients, 10 were positive for hepatitis C, only 1 was for hepatitis B, and none was infected by both type of virus.

Author Profile



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ABBREVIATION

HIV: Human immuno virus

HBV: Hepatitis B virus

HCV: Hepatitis C virus