PREVALENCE OF HEPATITIS B, HEPATITIS C AND HUMAN IMMUNODEFICIENCY VIRUS INFECTION AMONG PEDIATRIC HEMATOLOGY ONCOLOGY PATIENTS WITH REPEATED TRANSFUSION

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ABSTRACT

Blood transfusion are needed in patients with hereditary hemolytic anemia (particulary Thalassemia), malignancy, hemophilia and aplastic anemia to improve their overall survival. But repeatedly transfusion might carries a risk of blood-borne virus infection such as hepatitis and HIV. This study was conducted to provide prevalence of Hepatitis B, Hepatitis C and HIV infection among patients with repeatedly transfusion. One hundred fifty four patients were enrolled the study, with diagnosis of thalassemia 83 (53.9%) patients, Leukemia 34 (22.1%), Hemophilia 18 (11.7%), aplastic anemia 2 (1.3%) and other malignancy 17 (11.3%), Prevalence of Hepatitis B, Hepatitis C and HIV infection were 0.6% (1/154), 7.8% (12/154) and 0.6% (1/154) respectively. In this study prevalence of Hepatitis B, Hepatitis C and HIV infection were in agreement with the finding in other study. Education regarding transfusion transmitted infections is of prime importance.

Keyword : pediatric hematology oncology patients, repeated transfusion, infection

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INTRODUCTION

Million’s of lives saved each year through blood. Nevertheless people have increased of becoming infected with transmissible infections through of blood and blood products. Transfusion approaches also carried their problems, such as the incompatibility of red blood cells and plasma between donors and recipients and the possibility of transmitting infectious disease. Today, donor evaluation, laboratory screening tests and pathogen inactivation procedures are considered crucial tools to reduce the risk of transfusion-transmitted infection, but not to completely eliminate all risk (Bihl et al. 2007). Over the two last decades, much attention has been given to the prevention of transfusion-transmitted viral infections such as Hepatitis B, Hepatitis C and HIV (Bihl et al. 2007). This viruses are primarily transmitted parenterally. Transfusion of blood products are giving the high risk of transmitting these disease (Wong & Lee 2006). In developed country, prevalence of Hepatitis B infection in blood dependent patients are varies from 0.53% in Shiraz Iran to 22.5% in Palestine (Karimi & Ghavanini 2001, Jadallah et al. 2005). Hepatitis C infection prevalence varies from 15.7% to 37.9%. (Karimi & Ghavanini 2001, Jadallah et al. 2005, Borou et al. 2009). Meanwhile Karimi & Ghavanini (2001) found that the prevalence of HIV infection was 0.34%. The objective of this study was to provide prevalence of Hepatitis B, Hepatitis C and HIV infection in pediatric hematology oncology patient who has repeatedly transfusion.

MATERIALS AND METHODS

This study was conducted at Hematology Oncology Outpatient Clinic, Department of Pediatric, Dr Soetomo Hospital Surabaya from June to November 2009. A total
of 154 patients that have been followed up routinely and had been transfused, as a part of their management, irrespective of their age, sex, and history of jaundice were included in this study. A detailed clinical data was noted included age, sex, body weight, volume of transfusion and Hepatitis B immunization status.

All the patients who met the inclusion criteria tested for HBs Ag, anti-HBs and anti-HBC and HIV Ab using ELISA. Informed consent was taken for each patient involved. About five ml of patient’s blood sample was collected by a clean venepuncture. Positive result of HBs Ag was considered as Hepatitis B infection and anti-HCV positive was considered as Hepatitis C infection. Positive ELISA result for HIV was considered as HIV infection. Hb, ALT and AST were also tested. The result was reported descriptively and expressed as mean + standard deviation (SD).

RESULTS

One hundred fifty four patients were enrolled the study, 104 (67.5%) were males and 50 (32.5%) were females. Thirty five percent of them were from Surabaya (54/154). The age at the time of this study ranged between 2 yrs and 18 yrs with a mean age of 9.8 + 3.8 yrs., with average of body weight of 27 + 12.1 kg (9-60 kg). The diagnosis of these patients were thalasemia 83 (53.9%) patients, Leukemia 34 (22.1%), Hemophilia 18 (11.7%), aplastic anemia 2 (1.3%) and other malignancy 17 (11%). The total volume of transfusion that the patients got per year was 992.33 + 1383.7 ml (range 150-8050). Initial laboratorium data were carried out. Hemoglobin level ranged between 4.4 – 12 g/dL with mean 9.7 + 3.2 g/dL, AST level was 51.6 + 67.9 µ/L (10-593 µ/L) and ALT level was 48.2 + 71.7 µ/L (5-512 µ/L).

HBs Ag were detected in 1 (0.6%) patient and considered to have Hepatitis B infection. He was 8-year old boy, diagnosis as Thalasemia major in 2001 and since then he was regularly had PRC transfusion with total volume 3950 ml per year. Until the study was carried out, there was no history of joundice and clinical evidence of Hepatitis B infection. Anti HBs antibodies were detected in 50 (32.5%) patients although 68 (44.1%) of patients have no history of Hepatitis B immunization. Anti-HCV antibodies were detected in 12 (7.8%) of patients and considered to have Hepatitis C infection. Half of them were males. This patients were Thalasemia in 10 patients and Leukemia in 2 patients. All of these patients have no history of jaundice and clinical evidence of hepatitis viral infection before entered the study. Unfortunately, there was one patients (0.6%) had positive ELISA result for HIV and continued with Western blot assay which also gave positive result. A 7 year-old girl with Thalasemia diagnosed 4 years ago and had transfusion regulary with blood volume 4800 ml/year. There was no clinical evidence of HIV infection, antiviral drug has not been given yet due to absolute CD4 count above 500 cell/ µL.

Comparison of characteristic of patients with Non Infection, Hepatitis B Infection, Hepatitis C Infection and HIV Infection were summarized in tabel 1.

<table>
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<tr>
<th>Tabel 1. Comparison of characteristic of Patients with Non Infection, Hepatitis B Infection, Hepatitis C Infection and HIV Infection</th>
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<tbody>
<tr>
<td><strong>Non infection (n=140)</strong></td>
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<td><strong>Sex</strong></td>
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<td><strong>Age (years)</strong></td>
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<td><strong>Volume transfusion (ml/year)</strong></td>
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<td><strong>History of HBV vaccination</strong></td>
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<td>Yes</td>
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<td>No</td>
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<td><strong>Hemoglobine level (g/dL)</strong></td>
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DISCUSSION

Blood transfusion in patients with hereditary hemolytic anemia (particulary Thalassemia), malignancy, hemofilia and aplastic anemia has improved their overall survival but carries a definite risk of acquisition of blood-borne virus infection especially Hepatitis B, Hepatitis C and HIV infections (Mirmomen et al. 2006, Younus 2004). In this study prevalence of HBV infection was 0.6%. Among developed country, study in Iranian patients showed the prevalence varied from 0.53%-6% (Karimi & Ghavanini 2001, Younus 2004). Report from England in 1991-1997 showed that the prevalence of Hepatitis B infection associated with transfusion was 0.57% (Soldan et al. 1999). Means, prevalence of Hepatitis B infection in our study was similar to other country.

Hepatitis B infection can be prevented by a immunization. Although 68 (44.1%) of our patients have no history of Hepatitis B immunization, only 1/154 patients in this study has HBs Ag positive. The risk of transfusion-transmitted Hepatitis B infection has been reduced since introduction of the HBs Ag testing in the early 1970's, but it still fails to detect the presence of Hepatitis B during the ‘window period’ (Bihl et al. 2007).

Hepatitis C infection has gained importance particularly as one of the major complications in multiply transfused patients during the last decade. This is especially true for counties where Hepatitis C is more prevalent in general population and therefore also amongst blood donors. Data from the 8-centre Laboratory CDC Surveillance from 1993 to 1995 found that 6% of Hepatitis C infection patients got from blood transfusion (Wong & Lee 2006). The prevalence of HCV seropositivity in multiply transfused β-thalassemia patients has been observed to vary greatly, varies from 15.7% to 37.9% (Borou et al. 2009, Karimi & Ghavanini 2001, Jadallah et al 2005). But study by Younus resulted a high prevalence of HCV seropositivity (42%) (Younus et al. 2004). In our study, Anti-HCV antibodies were detected in 12 (7.8%) of patients, which was lower than previous study in developed country.

Data from Indonesia Red Cross at Surabaya in 2009 showed that 1238 bags were contaminated with Hepatitis B virus, 385 bags were contaminated with Hepatitis C virus and 115 bags were contaminated with HIV (Indonesia Red Cross 2009). Although Indonesian Red Cross’ screening of Hepatitis B virus, Hepatitis C virus and HIV was effective and the prevalence of Hepatitis B, Hepatitis C and HIV infection in our study were in agreement with the findings in other study, serious attempts have to be made to ensure a safe blood transfusion, so as to cut down the prevalence of Transfusion-transmitted viral infection in repeatedly transfused patients. Education regarding transfusion transmitted infections, including Hepatitis B, Hepatitis C and HIV infections, is of prime importance.

CONCLUSION

Prevalence of Hepatitis B, Hepatitis C and HIV infection in repeatedly transfusion pediatric hematology oncology patients were in agreement with the finding in other study. Meanwhile Education regarding transfusion transmitted infections, including Hepatitis B, Hepatitis C and HIV infections, is of prime importance.

REFERENCES