PREVALENCE OF HBSAG AND ANTI HCV IN MULTITRANSFUSED THALASSEMIC CHILDREN IN DISTRICT SWAT

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ABSTRACT

Background: Patients with thalassemia major are treated conventionally with multiple transfusions and are at a risk of developing Transfusion Transmitted Infections including Hepatitis B virus (HbsAg) and HCV-hepatitis (Anti HCV). Strict criteria of safe donor selection have to be adopted in order to minimize the risk of infections. The present study was carried out to estimate the real frequency of hepatitis B virus (HBV) and hepatitis C virus (HCV) in β -Thalassemia patients of district Swat, and to determine the infection-associated risk factors in these patients. A prospective study was conducted in a dedicated six beds chamber for these patients in the department of Child Health Saidu Teaching Hospital Saidu Sharif Swat from June 2010 to June 2012.

Methods: This study was carried out on 250 multitransfused thalassemia major patients. They were screened for hepatitis B surface antigen (HbsAg) and anti-hepatitis C virus antibodies (anti-HCV antibodies) by Enzyme Linked immunosorbent Assay (ELISA). The patient's age ranged from 2 years to 21 years. Majority of the patients included in the study had received more than 10 transfusions. The males were 162 (64.8%) and the females were 88 (35.2%).

Results: Out of the 250 patients 27 (11%) were positive for HbsAg and 93 (37%) were positive for anti HCV antibodies. Most of these patients have been transfused at home with unscreened blood during the days of unrest in the area, during which it was not possible to take their children to hospital for blood transfusion.

CONCLUSION: The prevalence of HCV and HBV infections are very high among β -thalassemic patients, which calls for a critical look into the prevailing transfusion practices and Adoption of stricter donor selection criteria to decrease the prevalence of both HCV and HBV infections effectively. It should be made sure that no transfusion should be done at home to avoid the transmission of these infections due to unscreened blood. In order to achieve the goal of decreasing the prevalence of HBV it should also be made sure that no child is left unvaccinated against Hepatitis B.

Keywords: HbsAg, Anti-HCV antibodies; Thalassemia major; Safe blood transfusion

INTRODUCTION

Thalassemia is one of the most common genetic diseases in the world. It is major health problem, causing much morbidity, early mortality and a great deal of misery for a family both financially and emotionally¹.

Thalassemia is an autosomal recessive disease prevalent in Pakistan. The carrier rate ranges between 4.5 and 5.5% in different regions and racial groups. At present, more than 150,000 thalassemia major patients exist in the country, and this number is on an increase, as little efforts are being made at any level to control this serious disease². The management of thalassemia major

essentially comprises of regular "safe blood transfusion" and a lifelong iron-chelation therapy. Unfortunately, our patients, even those managed at relatively better management centers, are prone to develop both types of complication, i.e., those transmitted through blood transfusion (particularly hepatitis C) as well as sequel of transfusion siderosis. Hepatitis B has a declining trend, probably as a result of regular pre-transfusion screening for HbsAg, use of hepatitis B vaccination and improved public awareness about the disease. HIV infection, fortunately, is uncommon in our setup³.

There has been a very high increase in the prevalence of hepatitis C in all the major cities of

Pakistan in the last ten years. Its prevalence mainly depends upon the socio-economic strata of the donors; like its prevalence is very low in college students (0.7%) as compared to factory workers (11.8%)⁴. Usman et al reported a prevalence of 4.3% for HCV antibodies in 7955 military recruits at Abbottabad⁵. Rizvi et al (Karachi) observed a prevalence of HCV-antibodies amongst 560 apparently healthy blood donors as 1.8%. Availability of vaccine against hepatitis B in EPI program and its provision to the patient before the start of blood transfusion is going to reduce the prevalence of this infection. As there is no vaccine available against HCV, so it should be ensured that safe blood transfusion practices must be adopted as the only tool against his infection⁶.

As our patients are usually from poor families, so it is usually observed that these patients are poorly treated for their hepatitis and their condition deteriorate very quickly due to their iron overloaded status⁷.

MATERIAL AND METHODS

This prospective study was conducted at the department of Child Health Saidu Teaching Hospital Saidu Sharif Swat, where six beds ward has been allocated for the management of thalassemic patients only. This study was conducted between June 2010 and June 2012. A total of 380 patients of β -Thalassemia major were registered during the study period, out of them 250 patients were selected who have received at least ten transfusions till now.

After taking a written informed consent from the patients or their guardians a detailed clinical history was taken. Age of the patient; age at diagnosis; frequency of transfusion; history of jaundice; history of sibs with thalassemia and any family member with positive HbsAg or anti HCV; enquiry about splenectomy; awareness about risk of developing transfusion transmitted hepatitis; whether transfusion blood was always screened for hepatitis; history of regular screening for hepatitis B & C; history of chelation and its form, dose and duration was specifically enquired etc. Then a methodical examination was performed

particularly for the measurement of hepato-splenomegaly and facial changes. All these information were recorded in pre planned proforma. About three ml of patient's blood sample was collected by a clean venepuncture. The blood was allowed to clot. Serum was separated and stored at 20°C till the time of test for HbsAg and anti HCV antibodies by ELISA.

RESULTS

A centre solely meant for management of thalassemic children was established in the department of child health in May 2010. The study started in June 2010 and a total of 380 patients were registered for transfusion. Out them 250 patients fulfilled the criteria for the study.

Out of 250 patients 162(64.8%) were male and 88(35.2%) were female patients. The age at the time of diagnosis was between 6month and 2 years. The age range during this study was between 2 and 21 years, as shown in Table I. The interval between transfusions was between 10 days to 40 days. In most of the cases with age above ten years the transfusion dependency was increasing.

As shown in table II, 43 % (108) of the patients were getting blood from a single transfusion centre. 36 % (90) of the patients used to roam about in search of free blood from one hospital to another and from one centre to another. 21 % (52) of the patients were transfusing most of the time at home. This group used to give unscreened blood most of the time. Only 55 % of the parents were aware of the risk of transfusion associated hepatitis. Screening of these 250 patients showed that 27(11%) patients were positive for HbsAg and 93(37%) patients were positive for Anti Hcv antibodies. Almost hundred percent of the patients transfused at home were either HbsAg or anti HCV positive and almost fifty percent were those who used to transfuse free blood where ever available. Of the 93 anti HCV positive patients 66 (71%) were female and 27(29%) were male, and out of 27 HbsAg positive patients 14(52%) were female while 13(48%) percent were male. Almost all the Home transfused patients were females; all these points have been shown in Table III.

Table I

Age of Patients	Male	Female
2- 5 years	25(15%)	13(15%)
5-10 years	43(27%)	31(35%)
10-15 years	37(23%)	24(27%)
15-21 years	57(35%)	20(23%)

Age and Sex Distribution of thalassemic patients

Table II

Place of transfusion	No of patients	% age Screening of blood
Single transfusion centre	108 (43%)	97%
Multiple transfusion centres	90 (36%)	40%
Home transfusion	52 (21%)	5%

Place and Percentage of Screening of blood for transfusion

Table III

Type of infection	Total no of patients	Male	Female
Hepatitis B	27 (11%)	13 (48%)	14 (52%)
Anti HCV	93 (37%)	27 (29 %)	66 (71 %)

Prevalence of HbsAg& Anti HCV Positive cases in thalassemic patients

DISCUSSION

Like the rest of the country, patients with thalassemia major are the most commonly transfused patients in swat district as well. In this study 250 multiple transfused thalassemia major patients were screened for HbsAg and anti HCV antibodies ELISA. Early and regular blood transfusion therapy in patients of β --thalassemia major decreases the complications of severe anemia and prolongs survival. This is particularly true in patients who are fortunate enough to receive adequate, regular iron-chelating therapy, and are therefore protected from organ damage by iron overload. However, if there is a breach in "safe blood transfusion", these patients are confronted by new clinical challenges, particularly in the form of transfusion transmitted diseases, especially HCV, HBV and HIV infections. Fortunately, HIV infection is still not a problem in our country, and HBV infection can be, to a great extent, prevented by a pre-transfusion immunization, HCV infection

has gained importance particularly as one of the major complications in multiply transfused patients during the last decade⁸. The prevalence rate of seropositivity increases with the number of transfusions units. This post-transfusion hepatitis has significantly contributed to morbidity in thalassemia. In our study, the prevalence of hepatitis B was 11%. Our study is comparable with study done by Cacopardo B and his colleagues who studied 152 Sicilian multitransfused thalassemia major patients and found 8.0% positivity for HbsAg⁹.

In this study 93(37%) patients were positive for anti-HCV antibodies while a lower frequency of HbsAg of 1.5% to 8.4% were reported in other studies^{10, 11}. A comparable very recent study from India showed prevalence of transfusion-transmitted infections such as HCV, and HBsAg respectively 45% and 2%¹².

In different parts of the world the prevalence of HCV infection in thalassemic patients differs: in India it is 16.7%,¹³ and in Malaysia 22.4%,¹⁴ and Lebanon 14%¹⁵. There are many reasons for lower prevalence, including awareness about hepatitis C and other blood-borne diseases indicating more advanced blood safety. On the other hand, some reports from Saudi Arabia infection was 63%,¹⁶ in Pakistan 60%¹¹. Much higher figures than that of the current study Thalassemic patients may acquire hepatitis C through the administration of HCV-infected blood collected during the donor window period. This is one reason in thalassemic children because the risk due to drug abuse and sexual activity are not present, in our part of the world. This could have caused great variation in the rate of HCV in thalassemic patients among different parts of the world¹⁷.

Frequent transfusion in peripheral centers may contribute to HBV and HCV infection in thalassemic patients⁴. As shown in our study, almost 50% of the patients transfused at easily available blood centers were positive and almost hundred percent patients transfused at home were positive for either of the hepatitis virus. The reason for home transfusion was limitation of moments

due to law and order situation in the study area, to take their children particularly the females above ten years of age to hospital and were usually transfused at home, most of the time with unscreened blood, and acquired transfusion associated infection. The same seems the reason for the high prevalence of females with the both HbsAg and anti HCV in our study. This high prevalence in females is also supported by another study in Khyber Pakhtunkhawa (KPK) in 2000 by Shah SMA et al¹⁸. In developed countries the transfusion associated HbsAg and anti HCV does not seem to be a big problem but it is still a big problem in developing countries like ours as our parents are not aware of this fact and the ratio of vaccination against Hepatitis B virus in old thalassemics is very low.

RECOMMENDATIONS

In order to cut down the prevalence of hepatitis B and anti-Hcv in multiple transfused thalassemics, serious attempts have to be made to ensure a safe blood transfusion services. In order to achieve the goals the following recommendations need to be implemented on the basis of fire fighter approach.

1. Education regarding transfusion transmitted infections to all parents particularly to parents of patients with transfusion dependent anaemia, including HCV, HBV & HIV infections, is of prime importance.
2. In selection of donors relatively younger donors without past history of Jaundice should be preferred. Blood camps should be arranged at colleges and other teaching institutions.
3. The patients should be encouraged to stick to one thalassemia management centre and must be vigilant about the screening of donors.
4. One of the causes of transmission of these infections could be due to the use of contaminated syringes. All the family members of any ill patient should be encourage to ask for the use of single use disposable syringes.

In order to stick to the golden rule of "Prevention is

always better than cure" an awareness program must continuously be running in every thalassemic management centre.

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