FREQUENCY OF HEPATITIS B AND HEPATITIS C IN MULTITRANSFUSED BETA THALASSAEMIA MAJOR PATIENTS IN DISTRICT SWAT

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ABSTRACT

BACKGROUND: Beta thalassaemia major is the commonest inherited as autosomal recessive disorder in Pakistan. Almost all patients beta thalassaemia major require blood transfusion within the first two years of life to prevent severe anaemia and its physical consequences. Due to repeated blood transfusions hepatitis B and hepatitis C infections can occur in these patients. To document the prevalence and frequency of hepatitis B & hepatitis C in multi transfused beta Thalassemia major patients in our set up.

STUDY DESIGN: A prospective descriptive study.

PLACE AND DURATION OF STUDY: The study was conducted in thalassaemia care center Al Fajar Foundation Blood Transfusion Services Swat from 1-1-2012 to 31-12-2012.

PATIENTS AND METHODS: Study was carried on 170 multi transfused thalassaemia major patients who were registered with Al Fajar Foundation Swat, irrespective of age, sex, time of diagnosis. Only those patients were included in the study who had received so far more than 10 transfusions. They were screened for hepatitis B and C by Enzyme Linked Immunosorbent Assay (ELISA). The subjects were in the ages range of 2 – 15 year, with 94 (55.29%) male and 76 (94:71%) female.

RESULTS: Out of these 10 patients (5.88%) were found to have hepatitis B surface antigen (HBsAg) positive and 37 patients (21.76%) hepatitis C virus (HCV) antibody positive.

CONCLUSION: In spite of the fact that screened blood is used for transfusions, still a large number of patients have been found infected with hepatitis B and C. It has been recommended that properly screened bloods using a reliable and accurate method are used for screening of blood to prevent transfusion transmitted diseases. It can be avoided by giving screened safe blood.

KEY WORDS: Hepatitis B, Hepatitis C, Thalassaemia Major, Transfusion

INTRODUCTION

Beta thalassaemia major is the commonest transfusion dependent inherited as autosomal recessive haematological disorder in Pakistan. It has been estimated that over 4,000 cases of beta thalassaemia major are born in Pakistan per year.¹ The carrier rate for beta thalassaemia major in Pakistan is reported to be 6 - 10%.² Almost all patients with thalassaemia major require blood transfusion within the first two years of life to prevent severe anaemia and its physical consequences.³ Standard transfusion regimens maintaining haemoglobin level above 10 gm / dl.⁴ The combination of regular blood transfusion and chelation therapy has improved the over all

survival of patients of thalassaemia major, thus transforming thalassaemia from a rapidly fatal disease of childhood to a chronic illness compatible with a prolonged life.^{5,6}

Beta thalassaemia major patients commonly receive transfusions and thus are at high risk of acquiring transfusion associated infections. Among these infections hepatitis B and C are the most common.⁷ Hepatitis B and C infections are one of the major public health problems of Pakistan and other developing countries.^{8,9} These infectious agents have emerged as a major cause of mortality in these patients.¹⁰ Hepatitis C virus (HCV) infection is more common than hepatitis B

virus in multi transfused thalassaemic patients. This may be due to introduction of hepatitis B vaccination for chronic transfusion recipients and application of reliable screening of blood donors¹¹. Prevalence is higher in high risk groups such as thalassaemics, haemodialysis patients, health care workers and intravenous drug users.¹² Blood transfusions is a well documented route of transfusion of hepatitis C virus and hepatitis B virus.¹³

The purpose of this study was to find out the prevalence of Hepatitis B and C virus infection in multi transfused beta thalassemia major patients in center where they are being transfused screened blood.

PATIENTS AND METHODS

This study was carried out at Alfajar Thalassaemia Foundation Swat from 1-1-2012 to 31-12-2012. A total of 170 children with confirmed beta thalassaemia major children registered in the centre were included in the study. Only those patients were included in the study that had got 10 or more blood transfusions.

A detailed history with emphasis on age at diagnosis, age at first transfusion, frequency of transfusion was taken so as to ascertain the number of transfusions and the physical examination was carried out such as facial feature, pallor, jaundice, lymphadenopathy and organomegaly.

Whole blood samples were collected and send to department of pathology Saidu Medical College Swat for screening of hepatitis B and C viruses. All sera were screened for Anti HCV antibodies and HB surface antigen with third generation ELISA, Diamata Anti HCV, USA and Diamate HBs Ag, USA.

STATISTICAL EVALUATION

Data was tabulated for statistical analysis. Frequency and the corresponding 95% confidence interval were calculated with S.P.S.S. Version 10.0 Data comparison was done using student's t test.

RESULTS

One hundred and seventy beta thalassaemia major

patients were included in the study. There were 94(55.29%) males and 76(44.71%) females. Ten (5.88%) patients were HBsAg positive and 37(21.76%) were HCV positive.

Table – I: Frequency of overall HBsAg, Anti HCV antibodies Positive & Negative in both genders.

Gender	No of patient (170)	HCV antibodies positive (37)	HBsAg positive (10)	HBsAg& antibodies negative (123)
Male	94 (55.29%)	21(56.76%)	7 (70%)	66(53.66%)
Female	76 (44.71%)	16 (43.24%)	3 (30%)	57(46.34%)
	170(100%)	37 (100%)	10 (100%)	123(100%)

The frequency of HBsAg and anti HCV antibody positive cases amongst male and female over various age ranges has been detected. It has been found that 10(5.88%) cases are HBsAg positive, males being more affected females (7.45% and 3.95%) as shown in Table- II. The difference between males and females was highly significant ($p < 0.01$).

Table – II: Frequency of HBsAg Positive in different age group & in both Sex in multitransfused thalassaemia patients

Age years	Male (7)	Female (3)	Total (10)
0 – 10	0	0 (–)	0 (–)
5 – 10	2(28.57%)	0 (–)	2(20%)
10 – 15	3(42.86%)	1(33.33%)	4(40%)
>15	2(28.57%)	2(66.66%)	4(40%)

In contrast high positivity has been detected for HCV antibodies, being positive in 37 (21.76%) cases. Positivity for males has been detected to an extent of 21 (10.80%) while in females as 16(21.05%) as shown in Table- III. The prevalence in both sexes was highly significant ($P < 0.01$).

Table – III: Frequency of Anti HCV antibodies Positive in different age groups & in both Sex in multitransfused patients.

Age years	Male (21)	Female(16)	Total(37)
0 – 5	1(4.76%)	2(12.50%)	3(8.11%)
6 – 10	4(19.05%)	3(18.75%)	7(18.92%)
11 – 15	9(42.86%)	6(37.50%)	15(40.54%)
>15	7(33.33%)	5(31.25%)	12(32.43%)

In our study of patients both hepatitis B surface antigen positivity and anti HCV antibody positivity has been detected to an alarming high level of 5.88 % and 21.76 % respectively. It depicts an upward trend in the overall positivity both for HBs Ag and Anti HCV antibodies which increases with age, which in turn is associated with increasing transfusion and thereby the risk of acquiring both the infections.

The results are also indicative of much higher probable prevalence of HCV amongst normal population than hepatitis B. Results revealed that male dominates female in all age group. It may be due to gender preference, commonly seen in access to health care facilities.

DISCUSSION

Beta Thalassaemia major patients are among the most commonly transfused persons in Pakistan. There are more than 70,000 people with thalassaemia in Pakistan and 6,000 children with thalassaemia are born annually¹⁴. Thalassaemia carrier rate is 6-10 % amongst our population. There are 8-10 million carrier of Beta Thalassaemia in our country¹⁵. In this study 170 multitransfused beta thalassaemia major patients were tested for HBsAg and Anti HCV antibodies by 3rd generation ELISA.

The prevalence of hepatitis B was 5.88 % in our study. This is consistent with the results of a study in Pakistan where hepatitis B sero prevalence was 3.90 %¹⁶. This is comparable with the result of another study of Shah MA & his colleagues who studied 250 multitransfused thalassaemia major patients and Cacopardo in 152 Sicilian multi transfused thalassaemia major patients and found 8.40 % & 8.0 % positivity respectively^{17, 18}. A study performed by Shah and Khan has shown the prevalence of HBsAg 7.1%¹⁹. In studies conducted at Peshawar and Bahawalpur 7.5% and 9.0% were positive for HBsAg respectively^{20, 21}. In another study of beta thalassaemia major patient the frequency of hepatitis B has been quite low as 1.4%²².

Prevalence of hepatitis C in patients of beta thalassaemia major varies in different studies. In our study 37 (21.76%) patients were positive for anti HCV antibodies this study is comparable with the study of Khuzestan province Iran showed prevalence of HCV in thalassaemia patients of about 28.1%²³. In Malaysia it was 22.4%²⁴ and in India 16.7 %²⁵. In another study the prevalence of hepatitis C was 23.8% in thalassaemia patients in Thailand²⁶. In Italy the prevalence of hepatitis C in beta thalassaemia major patients was 47.0%¹⁷. Variation in prevalence may be due to difference in

prevalence may be due to difference in prevalence of hepatitis C in general population and different assay methods used in detecting HCV.

Low prevalence of hepatitis B may be due to prior vaccination of thalassaemia against hepatitis B better screening assays and low prevalence of HBV as compared to HCV in our setup.

Majority of patients included in our study were transfused blood from the facilities where blood was effectively and comprehensively screened for hepatitis B and C viruses. Thalassaemia patients may acquire hepatitis C through the administration of HCV infected blood collected during the donor window period²⁷.

With the advent of proper screening in developed countries, blood transfusion is no longer a major route of transmission of these viral infections but in Pakistan the risk of acquiring viral infections through transfusion is still very high.

Vaccination against hepatitis B can prevent this infection. Al Fawaz and Ramia showed that 70% of thalassaemia children receiving hepatitis B vaccines were negative for HBsAg despite receiving a long number of blood transfusions²⁸.

CONCLUSION

It is important to consider that, in spite of the systematic screening of blood donors; a significant proportion of recipient develops hepatitis C virus infection. This finding demonstrates that more efforts should be made to improve blood transfusion safety. It is therefore imperative that highly sensitive seroassays be used in screening donors. Simpler measures such as enforced general asepsis rules, careful disinfection and equipment sterilization should be followed. Awareness should be made regarding complications of transfusion and effect of efficient chelation.

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