ORIGINAL ARTICLE

Seroconversion of Hepatitis B and C in Paediatric Patients with Thalassemia Major and Its Awareness Among Parents

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ABSTRACT

Background and Objectives*: Thalassemia is an autosomal recessive disorder. In Pakistan, there are about ten million patients of Thalassemia Minor and if both parents are carriers there are about 25% chances of having Thalassemia Major child. This study was conducted to find the prevalence of hepatitis B and C in thalassemia major patients and also to assess the awareness of disease in their parents.*

Methods: *This study was cross sectional study with probability cluster random sampling having a sampling size of 95. Four thalassemia centers were selected. Data was collected using structured questionnaire after informed consent. SPSS version 22 was used to analyze the data.*

Results: *The result of study showed 57.9% parents of thalassemia patients had knowledge of transfusion transmitted infections (TTI). Only 71.6% screened their blood before transfusion. Only 66.3% patients were able to manage the cost of treatment by their own.*

Conclusion: *Despite of screening practice still significant proportion of recipients had developed Hepatitis B & C infection. But in this study prevalence of Hepatitis C is significantly higher than Hepatitis B. It is therefore imperative to use sero assays in screening and awareness should be made regarding screening.*

KEYWORDS: *Thalassemia, Hepatitis B, Hepatitis C, Screening, Parents, Awareness.*

INTRODUCTION

Among the haemoglobinopathies, thalassemia is the most prevalent genetically transmitted blood disorder, with a prevalence rate of 6%.[1] It is an autosomal recessive disorder. It occurs due to defect in hemoglobin chain. Thalassemia Major or Cooley's anemia is one of the most severe forms of thalassemia, in which the normal red blood cells cannot be formed and do not produce enough hemoglobin which leads to severe anemia.[2,3] In Pakistan, there are about ten million patients of Thalassemia Minor and if both parents are carriers, there are 25% chances of having Thalassemia Major child.[3] Such patient needs regular blood transfusions and iron chelation therapy depending upon the severity of the disease. Every year about 5000 new patients are diagnosed with Thalassemia Major.[4] Consanguineous marriages along with high fertility rate, low literacy rate and unawareness are major factors responsible for high incidence of Thalassemia Major worldwide.[5] It is a familial disease, reported 56.7% of the couples were first cousins and 19.8% were relative's.[6] Regular blood transfusions are needed for Thalassemia Major patients, due to which they are mostly exposed to blood infections like Hepatitis C (HCV), Hepatitis B (HBV) Human Immunodeficiency Virus (HIV) and Malaria.[4] Transfusion transmitted infections TTIs are the major cause of mortality in thalassemia patients. To avoid these infections, regular blood screening should be done, which would improve the prognosis of the affected patients.[7] In Pakistan, there is lack of awareness regarding premarital screening for Thalassemia Major.[4] The gaps should be identified and standard guidelines for blood transfusion services should be followed.[8] The present study targeted Thalassemia Major patients in Lahore to assess the practice of blood transfusion and to figure out the prevalence of TTIs in this region. Few studies have been conducted in this area of research and there is a dearth of scientific evidence to target strategies to tackle this important public health issue.

METHODS

This cross sectional study was carried out in four thalassemia centers of Lahore (Fatima Memorial Hospital, Fatimid Foundation, Sundas Foundation and Ganga Ram Hospital Lahore) from January 2018 to August 2018. The approval from ethical committee and institutional review board was taken before the start of the study. Sampling technique used was

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Cluster Random sampling. Actual sample size calculated through prevalence was 87 which was rounded to 95 to avoid about 5% non-response rate. All patients of age between 2 to 18 years of both genders were included. Those who were not willing to participate in the study were excluded. Structured questionnaire was used after informed consent.

STATISTICAL ANALYSIS

The data was analyzed by using software statistical package of social sciences (SPSS version 22). Results were expressed as mean, standard deviation, range, frequency and percentages.

RESULTS

Mean age of the patients was 11 ± 7.4 years. Out of them, 53.7% were males and 46.3% females. Only 23 families had an income of more than 25000 PKR and 72 families had income of less than 25000 PKR per month. Regarding the most common caste affected with thalassemia in our sample, 13.6% were Rajpoots, 11.5% Arain, 10.5% Sheikh and 9.4% were Jutt. It was found that 34.7% families reported Thalassemia Major as their familial disease. A total of 57.9% of thalassemia parents were first cousins whereas 10.5% were second cousins. Only 16.8% parents knew about the disease of their child soon after the birth. Results showed 57.9% of parents had the knowledge about transfusion transmitted infections whereas 68.4% were aware about the spread of Hepatitis B and C through these transfusions. Those who managed the cost of their child's treatment were 66.3% so therefore 33.7% of the respondents get the social and financial support from the relevant hospitals or thalassemia centers. There were 77.9% patients who received blood transfusion. And of these 91.8% patients were screened before transfusion (Table-1) and 97.89% and 93.68% patients were negative for HBV and HCV respectively (Table -2).

DISCUSSION

Thalassemia is an inherited disorder characterized by abnormal production of hemoglobin. To sustain a good quality of life, regular blood transfusions are crucial. With these blood transfusions comes the increased likelihood of transfusion transmitted infections including hepatitis B, C and HIV, with Hepatitis C as the most prevalent. The mean age of the patients was 11 ± 7.4 years which is comparable to studies showing mean age of 10.1 ± 6.4 years and 9.26 years respectively.[9,10] Of all the thalassemia patients, 53.7% were males and 46.3% were females, which is comparable to two studies showing similar percentages of (56.8%, 43.2%)

Table- 1: *Frequency of patients who ever received blood transfusion.*

	Frequency	*Percentage*
Received transfusion	74	77.9%
Not received transfusion	21	22.1%
Total	95	100.0%
Screening before Transfusion		
Screened	68	91.8%
Not screened	6	8.2%
Total	74	100.0%

Table -2: *Pre-transfusion Hepatitis B or C status.*

	Frequency	*Percentage*
Positive HBV	2	2.1%
Negative HBV	93	97.89%
Positive HCV	6	6.31%
Negative HCV	89	93.68%
Total	95	100%

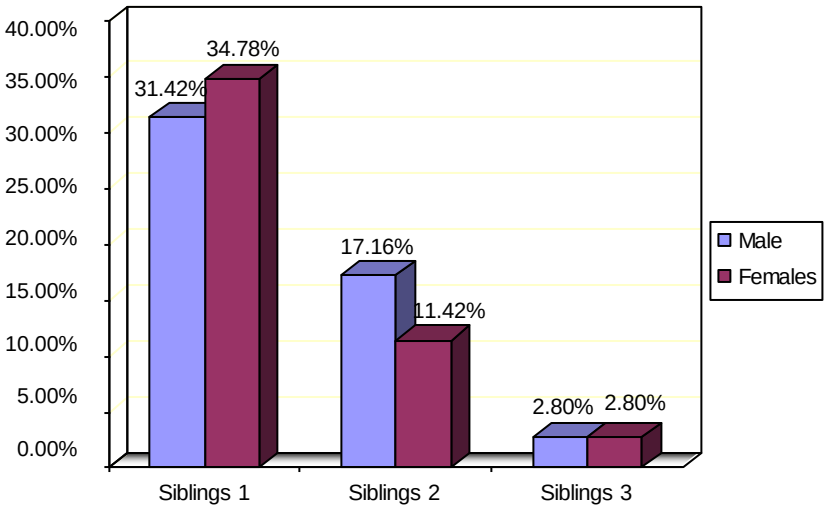

Fig. 1: *Number & gender of thalassemia affected siblings.*

and (58.3%, 41.7%) respectively which is suggestive that thalassemia occurs more in males than females.[11] In their study, 60.0% mothers and 23.2% fathers were accompanying the patients which are relating to a study conducted in 2015 showing similar percentages of 65.8%, 20% respectively.[11] Only 1.05% of the patient was married and all other were unmarried, cognating to a research showing that only 8.2% out of the total were married.[11] The most probable reason for single status is younger age group included in the study. Regarding caste distribution of the affected individuals, 13.6% were Rajpoots, 11.5% Arain and 10.5% Sheikh being the most common. Our results are comparable to a study in which the distribution of caste is almost the same as ours as 25%, 23%, 22% respectively.[12] Those who had family history of Thalassemia Major were 34.7%. Regarding the premarital relationship of respondents, 57.9% were first cousins, 10.5% were second cousins and 31.6% were related or out of family. These results are comparable to a research article which showed the results as 61.2%, 18.2% and 13.8% respectively.[13] The reason for increase in the prevalence of thalassemia among the non-related members could be no enforcement of law for premarital screening and only 1.05% in our study had their premarital screening for thalassemia. Among all the parents of thalassemia patients 68.4% were aware of increased transmission of HBV and HCV, this study is in contrast with a local study showing the awareness regarding importance of screening and transmission among only 40% parents.[14] It is indicated that the insight and screening practices have become better and therefore an increase in awareness has been reported (from 40% to 68.4%) from 2015 to 2018. Apart from blood transfusions, iron chelation therapy has improved the prognosis of Thalassemia Major patients. Regarding chelation, 37.9% patients started receiving iron chelation at 1-4 years of age, followed by 5-8 years (30.5%), 9-12 years (14.7%), and 13-16 (4.2%) whereas 12.6% of patients never received iron chelation therapy. The compliance with iron chelation is the most important factor determining the morbidity in beta Thalassemia Major and only 55.8% of the patients took the iron chelation regularly as prescribed, a study in 2015 indicated that only 38.55% patients used chelation therapy, the increase in use of chelation therapy from 38.55% to 55.8% indicate an increase in cognizance among the thalassemia patients.[10] According to our data, 42.1% of the patients had to receive blood on a monthly basis followed by 41.1% twice a month. Similar results were seen in a research conducted in 2015 showing percentages of 33.6% and 42.8% respec-tively.[12] The results depict that mostly patients had to receive blood transfusions either twice a month or once a month.

Transfusion transmitted infections occur very commonly in our setting because of lack of screening awareness and proper protocols for the transfusions. This study showed that out of total, 5.3% suffered from HBV and 20.0% from HCV infections. These results are in contrast to the local studies conducted in 2014 and 2016 which showed 41% and 32.45% respectively moreover our results are also comparable to an international study.[14,15&16] The decline in HCV occurrence from 41% (2014) to 32.45% (2016) to 20% (2018 in our study) showed increased awareness regarding TTIs. In our data, 68.4% had knowledge of the increasing spread rate of Hepatitis B and Hepatitis C. Among the total thalassemia patients 35% had their siblings also diagnosed with thalassemia (Fig. 1) Of all the respondents, 57.9% had existing knowledge about transfusion reactions. Regarding the financial support, only 41.1% had financial and social support and out of those 49.5% got financial support from the hospital or thalassemia center and 17.9% had support from their families while the mean cost per transfusion came out to be 1671 rupee. Only 66.3% of the respondents are able to manage the cost of blood transfusion. It indicates the lack of financial support from the thalassemia center or hospitals.

The effectual screening protocols before blood transfusions and pre-marital screening for thalassemia should be ensured. Pre storage filtration of blood and use of leucoreduced packed RBC's would help to lower the gauge of TTI's. ELISA & RAPID kits should be supplied free of cost for screening of TTI's and analysis of tests should be done with micro plate reader which has a 100% sensitivity to maximize the effectiveness of tests. Furthermore, adherence to iron chelation therapy should be promoted by cognitive behavioral therapy thus aiding patients to cope with stress. Regular health education campaigns to augment public aware-ness regarding prevalence of Hepatitis B and C in thalassemia major patients should be held. Involvement of celebrities and motivational speakers must be encouraged in order to amplify the importance of healthy blood donations which will serve as an inspiration for donors.

CONCLUSION

Thalassemia Major patients are at risk of acquiring Hepatitis B and C infections. Despite screening practices, still significant proportions of recipients have developed Hepatitis B and C. In this study the prevalence of Hepatitis C is significantly higher than Hepatitis B which is an alarming situation as it is one of the major causes of morbidity and mortality. Health professional teams should make combined efforts to ensure safe blood transfusions. Moreover, it will be productive to use highly sensitive sero assays for screening of donors and awareness should be made regarding TTI'S and safe screening practices.

LIMITATIONS OF STUDY

Range of age in our study is 2 to 18 years whereas according to research life expectancy of Thalassemia Major patient number has been increased due to increased compliance to chelation therapy and improved Iron chelation regimens.

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AUTHOR'S CONTRIBUTION
MZA: Conception of work and design.
SMA: Acquisition of data and substantial contribution and design.
SH: Drafting article and receiving critically.
ZA: Final approval of version.
MUK: Final approval of version.
ST: Final approval of version.

CONFLICT OF INTEREST
None to declare.

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