Status of Hepatitis B and C in Beta Thalassemia Major Patients

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Abstract

Objective: To determine the frequency of Hepatitis B and C in registered patients of thalassemia in a Tertiary Care Hospital

Patients and Methods: This cross-sectional study was conducted over a period of one year in Paediatric Department of Fauji Foundation Hospital Rawalpindi (FFH). Thalassemic patients with ages from 1 to 20 years, both male and female were included in the study. Their venous blood sample was collected and sent to FFH laboratory for detection of HBsAg Hepatitis B surface antigen (HbsAg) and hepatitis C virus (Anti HCV). Their demographic characteristics including age, gender, number of blood transfusions received per year and their vaccination status regarding Hepatitis B virus (HBV) were collected.

Results: Total 80 patients were included in the study. Out of which 45(56%) patients were male and 35(44%) patients were female. The mean number of blood transfusion per year was 21.65 ± 6.59 SD. Among total of 80 patients, 31(38.7%) were hepatitis C positive and their mean number of blood transfusions received was 24±6.9 SD. Patients with increased number of blood transfusions per year were found to be more HCV positive with p value of less than 0.05. In total 4 (5%) patients turned out to be hepatitis B surface antigen positive and all of these unvaccinated for Hepatitis B infection.

Conclusion: High prevalence of hepatitis C is seen in our study. Blood donor screening programmes and effective screening tools are needed to prevent the transmission of these blood borne infections.

Key Words: Blood transfusion, Thalassemia, Viral hepatitis.

Introduction

Beta Thalassemia is a group of hereditary disorders which results from abnormal beta globin chain production resulting in moderate to severe haemolytic anaemia. It is the most common genetic haematological disorder in Pakistan and the approximate carrier rate is 5-7%.¹ Patients with Beta Thalassemia Major depend on regular blood transfusions to maintain normal haemoglobin levels. Patients requiring multi transfusions are always at risk of acquiring transfusion transmitted infections. These regular transfusions have improved their overall survival but exposed these patients to an increased risk of developing various blood borne infections, the most common being hepatitis B virus (HBV) and C virus (HCV) infections.² With the introduction of Hepatitis B vaccine in routine vaccination programmes and hepatitis C screening their infection rate has decreased. But HCV is still considered to be the main cause of post transfusion hepatitis in Thalassemic patients.³-⁷ These patients are already at risk of developing chronic liver disease due to hepatic iron overload but once they get infected with these viruses’ risk of hepatic damage and chances of developing chronic liver disease increases further. Post transfusion hepatitis B and C viral infection may cause hepatic fibrosis and cirrhosis, increasing the mortality and morbidity rate in Thalassemic patients.⁸ Few studies have been done previously and showed HBV in 1.7% and HCV in 35% of Pakistani’s with thalassemia requiring multiple transfusions.⁹ The present study was undertaken to know the frequency of Hepatitis B and C in our registered cases of thalassemia and to assess the effectiveness of blood screening in our setup.

Patients and Methods

This cross sectional study was conducted in the Department of Pediatrics Fauji Foundation Hospital, Rawalpindi from Oct 2014 to Nov 2015. All the diagnosed Beta Thalassemia Major patients both male and female with age range from 12 months to 20 years who were on transfusion management were
included in the study. These patients were registered in Paediatric OPD and informed consent was taken from the parent/patient. Ethical issues were cleared. Their demographic characteristics including age, gender, number of blood transfusions required per year and their vaccination status regarding HBV were collected and entered on a preformed questionnaire. About 3-5ml of venous blood was drawn and collected in serum bottle under aseptic measures. Collected blood sample was sent to Fauji Foundation Hospital laboratory for evaluation of HBsAg and anti HCV Antibodies by third generation enzyme-linked immunosorbent assay (ELISA). Confirmation by PCR was done in all those patients in whom Hepatitis B or C was positive by ELISA. All the 4 patients who were hepatitis B positive were vaccinated against hepatitis B Vaccine, prevalence of these transfusion associated viral infections has reduced relatively but there is always a risk for acquiring these infections. Current study was done to know the prevalence of Hepatitis B and C infections in thalassemic patients in our set-up. A total of 80 registered patients of Thalassemia were screened for hepatitis B and C infections. In the present study 39% patients were positive for hepatitis C and 5% patients were positive for hepatitis B and these all 4 patients who were positive for hepatitis B were unvaccinated for hepatitis B virus. These results are comparable to the studies done in Turkey and Iran.11,12

In our study 39% of patients were positive for HCV. Hepatitis C prevalence in multi transfused thalassemics vary widely in different parts of world as observed from review of previous literature. It ranges from 5% in Malaysian patients to 63% in Iranian patients.13,14 In Pakistan the previous studies conducted from 1995 to 2002, reported 14-60% prevalence of HCV in beta thalassemia major patients.15 A study conducted in Pakistan by Hussain et-al in 2002 reported that among thalassemic patients 41.7% patients were positive for hepatitis C; the results are almost comparable to our findings.16 In another study done in Pakistan on chronically transfused beta thalassemic patients, the frequency of hepatitis C was 13% and that of hepatitis B were 1.25%.17 An Indian study reported hepatitis C infection in 23 % thalassemic patients and hepatitis B in 2.4% of patients.18 In developed countries the situation is different because of safe transfusions due to better screening programs. Moreover, in these countries, blood is also checked by nucleic acid technology for detection of these viral infections further minimising the risk of infection in window period. The transfusion related viral transmission is 2.5 per 1 million donations in US, Canada and several European countries.19 In our study out of total, 44% patients affected with hepatitis B and C infections majority were males (54%) which is in accordance with the finding observed in other studies.20,21 We also observed that hepatitis C infection was increased with increased requirement of blood transfusions. Hepatitis C infection was more prevalent in patients with more than 20 blood transfusions and thus has

### Results

Among 80 patients, 45(56%) were males and 35(44%) were females. Their age range was from 12 months to 20 years with mean age of 10.30 years ± 4.65 SD. Mean age of the male patients was 10 ± 4.5 SD and mean age of female patients was 11 ± 4.9 SD. The mean number of blood transfusion per year was 21.65 ± 6.59 SD. About 50%(40) patients were less than 10 years of age and 50% (40) patients were more than 10 years of age. Out of total 80 patients 4(5%) patients turned out to be HBs antigen positive. The mean number of blood transfusions given per year was 17.5 ± 5.6. Out of total 80 patients 68 patients (85%) were vaccinated against hepatitis B and 12 (15%) patients were unvaccinated.

### Table 1: Characteristics of Thalassemic patients

<table>
<thead>
<tr>
<th>Factors</th>
<th>Number of patients (n=80)</th>
<th>Hepatitis C +ve (n=31)</th>
<th>Hepatitis B +ve (n=4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Males n(%)</td>
<td>45 (56.3%)</td>
<td>19</td>
<td>2</td>
</tr>
<tr>
<td>Females n(%)</td>
<td>35 (43.8%)</td>
<td>12</td>
<td>2</td>
</tr>
<tr>
<td>Age of all patients (Mean ±SD)</td>
<td>10.30 ± 4.65</td>
<td>12.3 ± 4.3</td>
<td>10.2 ± 6.6</td>
</tr>
<tr>
<td>Patients ≤10 year of age</td>
<td>40 (50%)</td>
<td>12(39%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Patients &gt;10 year of age</td>
<td>40 (50%)</td>
<td>19 (61%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Number of blood transfusions (Mean ±SD)</td>
<td>21.6 ± 6.5</td>
<td>24 ± 6.9</td>
<td>17.5 ± 5.6</td>
</tr>
<tr>
<td>Vaccinated against hepatitis B (n %)</td>
<td>68 (85%)</td>
<td>-</td>
<td>0</td>
</tr>
</tbody>
</table>

All the 4 patients who were hepatitis B positive were unvaccinated. About 31(38.7%) patients were hepatitis C positive and among these 19(61.2%) patients were male and 12(38.8%) patients were female. Mean age of these patients was 12.3 ± 4.3 and average number of blood transfusions received was 24± 6.9. (Table 1) It was observed that those patients who had increased number of blood transfusions per year were found to be more HCV positive as compared to those with less blood transfusion with p value of 0.001.

### Discussion

Thalassemia is a hereditary hemolytic anemia requiring lifelong blood transfusions. This always carries a risk of transfusion transmitted infections thus increasing morbidity and mortality. As proved by other studies patients receiving multiple transfusions are at higher risk of getting viral hepatitis as compared to normal population.10 With introduction of safe blood transfusion and Hepatitis B Vaccine, prevalence of these transfusion associated viral infections has reduced relatively but there is always a risk for acquiring these infections. Current study was done to know the prevalence of Hepatitis B and C infections in thalassemic patients in our set-up. A total of 80 registered patients of Thalassemia were screened for hepatitis B and C infections. In the present study 39% patients were positive for hepatitis C and 5% patients were positive for hepatitis B and these all 4 patients who were positive for hepatitis B were unvaccinated for hepatitis B virus. These results are comparable to the studies done in Turkey and Iran.11,12

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significant association with frequency of transfusion. These findings were consistent with other studies.21-24

Conclusion
There is high frequency of hepatitis C in beta thalassemia major patients and blood transfusion is the major risk factor. Blood donor screening programs and effective screening tools are needed to prevent the transmission of these infections. Moreover health education programs are needed to create awareness about effective blood screening, morbidities associated with blood born infections and importance of hepatitis B vaccination.

Conflict of Interest
This study has no conflict of interest as declared by any author.

References