

Frequency Of Hepatitis B In Thalassemia Major Patients

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Abstract

Objective: The current study was conducted to check the frequency and risk factors of hepatitis B virus (HBV) infections among β thalassemia major patients.

Methods: The study was conducted over a period of 3 months from November 2021 to February 2022 in the department of Thalassemia Center CMH Rawalpindi. The study consists of thalassemia patients aged 6 months to 15 years including both male and female patients. Their venous blood was taken and transmitted to the laboratory, Armed force institute of Pathology CMH Rawalpindi, for a hepatitis B surface antigen test (HbsAg). Their demographic information was gathered, including their age, gender, number of blood transfusions received each year and Hepatitis B virus (HBV) vaccination status.

Results: Out of 100 patients there were 45 patients were male and 55 patients were female. The patients' ages span from 6 months to 15 years, with a mean age difference of 11.20 years and a standard deviation of 5.56. In three months, the mean difference in the number of blood transfusions received by patients was 22.7 6.6 SD. Patients under the age of ten were 50 percent of the time, and patients beyond ten were also 50 percent of the time (50 percent). Five (5%) of the total 100 patients tested positive for hepatitis B. In three months, the mean difference in the number of blood transfusions received by patients was 18.2 5.6 SD. Thirty (30%) patients out of a total of 100 were not immunized.

Conclusion: The frequency of hepatitis B in beta-thalassemia major patients is minimal (less than 5 per 100) is seen in our study. To reduce the future risk of TTI, the development of strong national and regional policies on safe blood transfusion procedures, VNRD-based transfusions, and universal quality-assured donor screening are recommended.

Key Words: Thalassemia, Hepatitis B, Blood transfusion, viral infection

Introduction

Thalassemia is a hereditary condition that affects about 1.5 percent of the world's population. Thalassemia is a condition that is passed down through the generations. The severity of the disease is determined by the mutation's type and the existence of mutations in both alleles (thalassemia major as -thalassemia) or just one allele (thalassemia minor as -thalassemia) (thalassemia minor). (Ansari MM et al 2002). In Pakistan, -thalassemia is frequent, affecting 5-7% of the population. Anemia in these people must be treated with blood transfusions on a regular basis. (Khalil et al 2016).

As it is still the only therapy option, these individuals are at significant risk of developing liver cirrhosis or cardiac problems, and they frequently succumb to iron overload before reaching the age of 30. (Hussain H et al 2008). Viral hepatitis infections are one of the top eight causes of death worldwide, accounting for around 1.34 million fatalities per year. Around 257 million people suffer from chronic HBV infection. Because many people go undiagnosed and untreated for years before experiencing health concerns, these diseases are known as silent killers. In terms of reducing the detrimental effect of HBV on healthcare systems, the World Health Organization formed the Global healthcare strategic plan on Hepatitis to eradicate HBV by 2030. (Ansari SH et al 2012) In Pakistan, about a million people are infected with HBV, with roughly 200,000 new cases reported each year. HBV has a prevalence of 3-5%. Since those infections illnesses being transferred by blood, numerous individuals are anticipated to become ill as a result of poor blood safety measures throughout Pakistan. Additionally. Several medical practitioners may indeed be contaminated despite recognizing it, because there is no uniform health personnel monitoring. (Ahmed et al.2021).

Since safe blood is not always readily available, β -thalassemia patients frequently contract transfusion-transmitted illnesses (TTIs), which have affected a large number of Pakistani patients. The high number of TTIs is attributable to procedures and measures of blood supply that fall below the WHO's recommended standard, as well as other nosocomial transmissions caused by a lack of resources and inadequately trained employees. In 2005, overall occurrence of HBV infection within Pakistan was 4% in general populace and much less than 2% in adolescents, but that was

twice as prevalent in thalassemia victims. (Ehsan et al. 2020) The main objective of this study was to measure the incidence of HBV infection in our database of β thalassemia patients.

Materials and Methods

The cross-sectional study was conducted over a period of 3 months from November 2021 to February 2022 in the Department of Thalassemia Center CMH Rawalpindi. Male and female thalassemia patients varying in age between 6 months to 15 years were included in the research. Their venous blood was taken and transmitted to the laboratory, Armed force institute of Pathology CMH Rawalpindi, for a hepatitis B surface antigen test (HbsAg). Their demographic information was gathered, including their age, gender, number of blood transfusions received each year, and Hepatitis B virus (HBV) vaccination status.

Ethical Approval: Before sampling, all patients and/or their guardians/parents gave their informed consent. All the ethical issues were cleared.

Serological Analysis: Their demographic information, such as age, gender, the number of blood transfusions they needed per year, and their HBV vaccination status, were gathered. Under aseptic conditions, about 3-5ml of venous blood was taken and collected in a serum vial. A blood sample was collected and forwarded to the laboratory, Armed force Institute of Pathology CMH Rawalpindi for testing of HBsAg antibodies using a third-generation enzyme-linked immunosorbent assay (ELISA). All patients with Hepatitis B who tested positive by ELISA had their Hepatitis B by PCR.

Statistical analysis: When proportions are reported as percentages, the range is presented for means and related SDs (mean SD). In relation to age, the number of infusions administered, and serum Ferritin levels, the incidence of HBV was evaluated by applying Fisher's exact test comparing HBsAg reactive and non-reactive respondents. Statistical analyses were conducted using IBM's SPSS software version 21, with P-values of less than 0.05 deemed statistically significant.

Inclusion Criteria: Frequency of Hepatitis B in Thalassemia major patients of the age bracket 6 months to 15 years were included in the study.

Exclusion Criteria: Thalassemia minor patients, frequency of hepatitis C and patients older than 15 years were not included.

Results

There were 45 (45%) males and 55 (55%) females among the 100 patients. The patients' ages span from 6 months to 15 years, with a mean age difference of 11.20 years and a standard deviation of 5.56. In three months, the mean difference in the number of blood transfusions received by patients was 22.7 6.6 SD. Patients under the age of ten were 50 percent of the time, and patients beyond ten were also 50 percent of the time (50 percent). Five (5%) of the total 100 patients tested positive for hepatitis B. In three months, the mean difference in the number of blood transfusions received by patients was 18.2 5.6 SD. Thirty (30%) patients out of a total of 100 were not immunized.

Table-1: Characteristics of Thalassemia Patients

Factors	Number of patients (n=100)	Hepatitis B+ve (n=5)
Males n (%)	45 (45%)	4
Females n (%)	55 (55%)	1
Age of all patients (Mean ± SD)	11.20 ± 5.56	10.4 ± 6.6
Patients ≤ 10 years of age	50 (50%)	0
Patients > 10 years of age	50 (50%)	5 (5%)
Number of blood transfusions (Mean ± SD)	22.7 ± 6.6	18.2 ± 5.6
Vaccinated against hepatitis B n (%)	70 (70%)	0

*The five patients who tested positive for hepatitis B were all unvaccinated. With a p-value of 0.001, it was discovered that patients who received more blood transfusions in 3 months had more hepatitis B positive than those who received fewer blood transfusions in 3 months.

Discussion

Thalassemia is genetic hemolytic anemia that necessitates the use of blood transfusions for the rest of one's life. Transfusion-transmitted infections are always a possibility, increasing morbidity and mortality. (Ishahak I et al 1993) Patients who receive several transfusions have a higher risk of viral hepatitis than the general population, according to prior research. (Azerkievan et al.2009) Repeated blood and blood product transfusions are one method of transferring hepatitis B, to patients in need of blood,

particularly those with thalassemia. (shah N et al.2010) Frequent blood transfusions, iron overload, spleen excision in certain individuals, and low zinc levels, as well as the risk of infection in hospital settings, should all be considered in thalassemia patients. (Mirmomen et al.2006) Hepatitis B viruses were the leading cause of hepatitis after blood transfusions in patients receiving long-term injections before the HBsAg tests became obligatory for screening donated blood. (Surchi et al.2018) Vaccination now has a considerable impact on the hepatitis B virus. Although the prevalence of transfusion-associated viral infections has decreased since the advent of safe blood transfusion and the Hepatitis B vaccine, there is still a risk of infection. The purpose of this study was to determine the frequency of Hepatitis B infections in our thalassemia patients. Hepatitis B infections were tested in a total of 100 registered Thalassemia patients. In this study, 5% of patients tested positive for hepatitis B, with all 5 individuals who tested positive for hepatitis B being unvaccinated against the virus. Hepatitis B was found to be 1.25 percent common in another study. Hepatitis B infection was found in 2.4 percent of patients, according to an Indian study. The situation is different in industrialized countries due to safer transfusions as a result of improved screening processes. Furthermore, in these nations, blood is tested using nucleic acid technology to detect viral infections, reducing the risk of infection during the window period. Transfusion-related viral interaction is 2.5 per 1 million donors in US and numerous European countries. In our analysis, 3 % percent of patients with hepatitis B infections were males which is consistent with findings from other studies. As per 2009 research of thalassemia patients in South Khorasan-Birjand, the proportion of HBs-Ab infected patients (57.9%) was identical to that of the latest research. HBV was discovered in 3% of beta-thalassemia patients in research done in Bandar Abbas in 2018. Similar research performed I Lorestan in 2018 indicated that the frequency of HBV in these individuals is 0%. According to a 2015 research of thalassemia patients in the country's northwest, the prevalence of HBsAg is zero percent.

Conclusion

Since the department undertakes cross-matching of blood prior to transfusion, the frequency of hepatitis B in beta-thalassemia major patients is minimal (less than 5 per 100). But negligence in inadequate

resources, inadequate safety procedures, and a fragmented blood transfusion system are all probable causes of the 5% of cases. To reduce the future risk of TTI, the development of strong national and regional policies on safe blood transfusion procedures, VNRD-based transfusions, and universal quality-assured donor screening are recommended. Without these beneficial reforms, the present transfusion system risks exacerbating the issue.

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