SHORT COMMUNICATION

INTERNATIONAL JOURNAL *"Advancements in Life Sciences"*

Open Access

Date Received: 28/06/2014; Date Revised: 15/08/2014; Date Published Online: 25/08/2014

Prevalence of HCV in β-thalassemia major patients visiting tertiary care hospitals in Lahore - Pakistan

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Citation: Nazir S, Faraz A, Shahzad N, Ali N, Khan MA, Iqbal M, Khan MF, Ahmed T, Rakha, A, Sabzwari J, Bhatti MS. Prevalence of HCV in β-thalassemia major patients visiting tertiary care hospitals in Lahore - Pakistan. (2014). Adv. life sci., 1(4), pp. 197-201.

Key words: Prevalence, HCV, Thalassemia, Transfusion Transmitted Infection

Abstract

Background: Post-transfusion hepatitis (PTH) is majorly caused by hepatitis C virus (HCV). So, recipients of blood/blood products, post-transfusion hepatitis (PTH), renal dialysis patients and intravenous drug users all represent high-risk groups for infection. The aim of the present research was to determine the prevalence of HCV antibody in β-thalassemia major patients visiting different tertiary care hospital in Lahore, Pakistan.

Methods: HCV seroprevalence and risk factors were studied in 200 β-thalassemia major patients (24 females, 176 males) with different age groups by second generation ELISA during January 2013 to May 2013. Confirmed β-thalassemia major patients from three different tertiary care hospitals were selected with special reference to age, age at the time of diagnosis, frequency of transfusion and present clinical status.

Results: Among 200 patients, 82 (41%) were found reactive for HCV antibody with age range of 2 to 18 years with mean age of 8.5 years.

Conclusion: This study showed that hemodialysis patients and β-thalassemia sufferers were at higher risk of having HCV infection; the prevalence being 41%.

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Introduction

β-thalassemia is among the most common genetic disorders in the world. It happens due to genetic defects in process of haemoglobin synthesis, β-thalassemia major is caused by defect in bête globin chain synthesis is the main clinical manifestation of this phenotype of disorder [1]. In order to avoid the chronic anemia in thalassaemic individuals, they may need to get 4-6 blood units per month. They are also prone to blood borne infections. Multiple transfusions in patients of β-thalassemia major who are treated by a regular transfusion regimen, are at a risk of developing transfusion transmitted infections (TTI) including hepatitis C. Children suffering from β-thalassemia major require repeated blood transfusions which may be associated with dangers like alloimmunization, iron overload, and contraction of infections such as HBV, HCV and HIV [2].

In the absence of stem cell transplantation the disease is treated by lifelong red cell transfusion to keep the haemoglobin level between 9–11.5 g/dL. Regular blood transfusions are essential to maintain growth and development during childhood and also to sustain good quality of life during adulthood [3,4].

Patients with β-thalassemia major are at a high risk of developing hepatitis due to the transfusion of blood from donors infected with hepatitis B virus (HBV) [5]. The incidence of hepatitis B infections based on serological studies approaches 100% in β-thalassemia major where HBV is endemic.' The incidence of this HCV antibody in blood transfusion recipients and donors, with PTH, and in other high risk groups, like patients with HIV, haemophilia, chronic hepatitis, homosexuals, needle stick victims is well established [6].

The management of β-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 sequelae 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 setup. Last decade has witnessed a tremendous increase in the sero-prevalence of hepatitis C amongst almost all the major cities of Pakistan. However, it has been observed that amongst blood donors belonging to different socioeconomic strata, this seroprevalence is variable; the figures are much lesser amongst young college students (0.7%) and non-remunerated donors (1.3%) as compared to factory workers (11.8%) [7].

Furthermore, amongst the major transfusion transmitted infection (TTI) markers in our service, the overall HCV seroprevalence is high (4.1%) Life-long red blood cell (RBC) transfusion remains the main treatment for severe β-thalassemia [8]. The use of regular blood transfusion and of chelation therapy with deferoxamine has led to the transfusion of β-thalassemia major

from a fatal disease in early childhood to a chronic illness associated with prolonged survival [9,10].

Methods

The whole bench work was conducted at the Ittefaq hospital (Trust) Lahore Pakistan.

Data was obtained from 200 β-thalassemia major patients aged one year or more receiving regular blood transfusions at a major transfusion center in Lahore Pakistan. Clinical data and laboratory results were subsequently checked. Anti HCV were found Reactive in 41% of cases of β-thalassemia patients. Descriptive statistics were used to elaborate results. The samples of β-thalassemia patients were collected from different Hospital and clinical Lab of Lahore Pakistan Which includes Sundas Foundation, Fatmeed Foundation and Children Hospital, Lahore. B-thalassemia major patients treated with ten or more transfusions were included in the study

β-thalassemia subjects were selected by clinical history. Diagnosis of β-thalassemia was confirmed by standard haemoglobin electrophoresis clinical data of patients who fulfilled the criteria were collected and entered in the questionnaire, with special reference to age, age at the time of diagnosis, frequency of transfusion, present clinical status, any increase in transfusion requirements. Blood samples were obtained for detection of anti-HCV and red cell alloantibodies. The serum was separated using standard blood bank method and stored in labeled tubes at minus 20°C. Anti HCV screening was performed on instrument ARCHITECT (i 1000 SR) Chemiiluminescence (CMIA) Technology. Antibody Screenind.

Results

Of the total 200 cases studied 176 were males and 24 were females. The patient age ranged from 1 to 18 years were with mean age of 7.8 years with ±SD 4.4. The age on first transfusion was 3 to 48 months with mean age of 9 months with ±SD 8.0 months. Among 200 patients 82 (41%) were Reactive for anti-HCV with age range of 2 to 18 years with mean age of 8.5 years. The mean age at 1st transfusion was 8.7 months. Among them 28 having blood group of O +ve, 25 B +ve, 18 A +ve, 8 AB +ve and 3 were A -ve.

Discussion

The present study was conducted to find out the rate of alloimmunization and transfusion transmitted infection. Growth retardation is a common finding in thalassemics. The main reasons could be iron overload, associated endocrinopathies, hypoxia and chronic anemia. Slow growth rate with prolongation of growth period is seen in many cases and normal stature is rarely attained even in well managed patients. Some authors have described that, the rate of alloimmunization is increased after splenectomy. The reason put forward is that the spleen effectively filters many antigens that may probably cause production of antibodies.

Early and regular blood transfusion in patients of β-β-thalassemia major decreases the complications of severe anemia and prolongs survival. It is particularly so in patients who are fortunate enough to receive an adequate, regular iron chelation therapy,

and are therefore protected from organ damage by iron overload.

Fortunately, 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 10 years [11]. This is especially true for counties where HCV is more prevalent in general population and therefore also amongst blood donors. The prevalence rate of seropositivity increases with the number of transfusions [12]. This post transfusion hepatitis has significantly contributed to morbidity in β-thalassemia [13]. It should be remembered that HCV hepatitis is more threatening than HBV hepatitis due to a greater risk of chronic liver disease.

In our study, a high prevalence of HCV seropositivity 41%, although patients were usually transfused at Ittefaq Hospital (trust) where pre-transfusion screening of the transfused is regularly performed. However, it was guessed during interview of the patients' parents that in almost all instances, the patients did get transfused with blood from some other centers, where pre-transfusion HCV antibody screening was not guaranteed. Furthermore, the parents of about 60% of patients were not aware of the importance of HCV antibody screening of transfused blood. In many previous studies, the prevalence of HCV antibodies was observed to be reduced after the institution of a regular HCV screening before transfusion.

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