

**RED BLOOD CELL ALLOIMMUNIZATION IN EGYPTIAN PATIENTS  
WITH TRANSFUSION DEPENDENT THALASSAEMIA**

By

**Mona Gamal Mostafa**

A thesis submitted in partial fulfillment

Of

The requirements for the degree of

**Master of Science**

In

**Clinical and Chemical Pathology**

Department of Clinical and Chemical Pathology

Faculty of Medicine, Fayoum

**Fayoum University**

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## ABSTRACT

**Background:** Thalassaemia is the most common inherited haemoglobinopathy in the world. Lifelong and frequent red blood cell transfusions remain the main treatment for severe cases. The development of alloantibodies against red blood cell antigens complicates RBCs cross matching, limits the availability of compatible units and may shorten RBCs survival.

**Aim of the work:** The aim of this study was to determine the frequency of red blood cell alloantibodies, identify their types and study some risk factors which may contribute to their production in Egyptian multi-transfused thalassaemic patients.

**Patients and Methods:** The present study included 200 multi-transfused thalassaemic patients attending Fayoum University Hospital in the period between May 2013 and January 2014. They were all transfused with more than 10 PRBCs matched only for ABO and Rh-D. Patients were subjected to full history taking and clinical examination. Blood samples were collected for ABO and Rh D blood grouping, antibody screening and identification by column-gel agglutination technology.

**Results:** Alloantibodies were detected in 17 (8.5%) of the 200 multi-transfused  $\beta$ -thalassaemia patients included in this study. The anti-D was the most frequent alloantibody encountered in 8 of the 200 patients (4%), followed by anti-C in 3 patients (1.5%) while anti-c, anti-E, anti-K and anti-Fy<sup>a</sup> were each found in 2 patients with equal frequencies (1%). Significantly higher rates of alloimmunization were found in female patients, in patients with  $\beta$ -thalassaemia intermedia and sickle  $\beta$ -thalassaemia, in splenectomized patients and in Rh D negative patients. Patients who started blood transfusion after 3 years of age, patients with progressive transfusion course or with transfusion reactions had a significantly higher frequency of alloimmunization. Alloimmunized patients had a significantly higher mean age and higher mean age of onset of transfusion compared to non alloimmunized patients. There was no statistically significant difference between the two groups as regards blood transfusion duration, frequency and total number of blood units transfused.

**Conclusion:** 8.5 % of the patients included in this study were alloimmunized to red blood cell antigens. The most common alloantibodies were anti-D and anti-C of the Rhesus blood group system. Other clinically significant alloantibodies occurring with lower frequencies were anti-E, anti-c, anti-K and anti-fy<sup>a</sup>. To minimize the risk of alloimmunization, the most frequent clinically significant alloantibodies detected should be included in an extended RBCs matched protocol for multi-transfused thalassaemic patients.

**Key words:** Alloimmunization, Thalassaemia.

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