Case Report

Hemolytic disease of the newborn caused by anti-U: A case report

Renata Esteves Almeida¹, Sandro Artur Fierz², Flavia Miranda Constantino-Bandeira², Patricia Olga Souza-Sergio³, Cristiane Sá Ferreira Facio³, and Alexandre Gomes Vizzoni⁴

¹MD, Transfusion Agency-Herculano Pinheiro Maternity Hospital, Rio de Janeiro, Brazil
²MD, PhD, Blood Bank-University Hospital, State University of Rio de Janeiro, Rio de Janeiro, Brazil.
³MD, Ambulatory of Perinatal Hemolytic Disease-Martagão Gesteira Institute of Childcare and Pediatrics, Federal University of Rio de Janeiro, Rio de Janeiro, Brazil.
⁴PhD, Transfusion Agency-Evandro Chagas National Institute of Infectious Diseases, Rio de Janeiro, Brazil.

Abstract

Maternal red blood cell alloimmunization is an important cause of morbidity and mortality in the antepartum and neonatal periods. Typically, the serological diagnosis of Hemolytic Disease of the Fetus and Newborn (HDFN) includes a positive direct antiglobulin test on the infant’s red blood cells and the presence of an IgG red cell alloantibody in both maternal and cord sera.

Introduction

The HDFN can lead to fetal hemolytic anemia, jaundice, premature birth and is an important cause of neonatal morbidity and death [1,2]. Most cases of HDFN, caused by naturally formed ABO antibodies, generally lead to minimal or mild symptoms. Although the incidence of anti-D associated HDFN has drastically reduced with Rh immune globulin prophylaxis, HDFN due to other maternal red cell alloantibodies still remains a concern [3].

The MNS is a highly complex blood group system consisting of 49 antigens. S (MNS3) and s (MNS4) are a pair of antithetical antigens pair of this system. Red cells of about 1% African Americans and a higher incidence of black Africans are S-s- and lack the high frequency antigen U (MNS5). If immunized, these individuals may produce anti-U [4]. The HDFN owing to anti-U has rarely been reported. In this case, a rare red blood cell alloantibody could cause hemolytic transfusion reaction and hemolytic disease in the fetus and newborn [5,6]. Here, we describe the case of a female newborn presenting a strongly positive direct antiglobulin test due to an anti-U.

Case report

A female newborn delivered at 39 weeks’ gestation in Herculano Pinheiro Maternity Hospital, Rio de Janeiro, Brazil, weighing 3.858 g, Apgar score 9/9, jaundiced 1+/4+, swollen eyelids, with eyelid edema, presented a strongly positive Direct Antiglobulin Test (DAT) with evidence of clinically significant mild hemolysis. She received double phototherapy on her first day of life and her bilirubin level was 20.0 mg/dL within 48 hours after birth. Due to the presence of maternal alloantibodies in the blood of the newborn against the high frequency antigen, and the consequent difficulty in performing immediate diagnosis and providing opportunities for the...
The severity of HDN varies from asymptomatic to fatal. The S–s– phenotype is typically found in people of African origin and represents a challenge in transfusion sets, especially when S–s– patients develop anti–U [7]. In addition to the anti–U alloantibody, the maternal phenotype Fy (a–b–) could also suggest the presence of another rare antibody against high frequency antigens: anti–Fy1. However, in the case of Brazilian African–descent women, the phenotype Fy (a–b–) is the product of a point mutation in the GATA promoter region of the Duffy gene, being responsible for the absence of antigen expression in red blood cells but not in other tissues. This frequency ranges from 60% to 100% in the black population.

Despite of the fact that anti–D alloantibodies are the most common cause of newborn hemolytic disease, antibodies against other blood group antigens could cause serious and even fatal fetal and perinatal hemolytic diseases. A literature review suggests that the pathophysiology of anti–U manifestation is similar to Rh isoimmunization. The anti–U antibody can develop because of pregnancy or blood transfusion in 1.2% of African descent susceptible to developing the antibody (U–). Finally, is necessary to point out that when an antibody against a high frequency erythrocyte antigen is identified in African or American–descent pregnant women, anti–U should be considered and the fetus or newborn should be monitored/ followed up until the safe finding of complete consumption of the maternal alloantibody.

References


[Box: Discover a bigger Impact and Visibility of your article publication with Peertechz Publications]