THE JOURNAL OF OBSTETRICS AND GYNECOLOGY OF INDIA

The Journal of Obstetrics and Gynecology of India (July–August 2014) 64(4):291–292
DOI 10.1007/s13224-012-0275-0

CASE REPORT

Severe Hemolytic Disease of Newborn in a Rh D-Positive Mother: Time to Mandate the Antenatal Antibody Screening

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Received: 9 December 2010 / Accepted: 24 July 2012 / Published online: 23 October 2012

Introduction

Since the time the routine administration of Rhesus (Rh) immunoglobulin to all Rh-negative pregnant women was implemented, the number of newborns with hemolytic disease due to anti D has drastically come down. The focus now has shifted to non-D Rh antibodies as the cause for alloimmune HDN. In this article, we report a case of severe neonatal hyperbilirubinemia caused by anti c, which could have been identified if routine antenatal screening were done irrespective of Rh status. The definitive diagnosis has significant influence on management.

Case Report

A female infant born at 36 weeks of gestation was referred to our tertiary care center on day 5 for the management of severe jaundice. Mother was 29-year-old third gravida with a living child and an abortion. She had received two units of blood transfusion 5 years ago during the delivery of the first child. She had an abortion two and a half years ago. Mother's blood group was O Rh D positive. Baby had developed jaundice 2 days after birth. Baby's blood samples were sent to blood bank for direct antiglobulin testing to rule out immune cause, and it was found to be positive (3+). Hematological evaluation showed total bilirubin of 26 mg/dl with an unconjugated bilirubin level of 24.6 mg/dl. Hemoglobin was 15.3 g/dl, and peripheral smear examination showed good evidence for hemolysis. All the above investigations suggested ongoing hemolysis probably due to an immune cause. As mother's group was Rh D positive, antibody screening was not done during antenatal period. We requested samples of mother and father for immunohematological work up, and details are shown in the Table 1. To find out the alloantibody causing hemolysis, we did antibody screening in mother's serum and eluate prepared from the baby's red cells. Results of antibody screening test are shown in the Table 2. On testing the mother's serum with 11-cell antibody identification panel (DiaMed-ID, Switzerland), the exclusion method indicated anti c as the antibody in the sample. However, we could not rule out anti E. As baby is negative for E antigen, the most probable culprit of hemolysis is anti c. A timeline displaying baby's bilirubin level is shown in Fig. 1. Baby was initially managed with phototherapy. Once the antibody was identified, anti c negative blood was transfused to the patient on day 6. Baby improved with the treatment and was discharged once the bilirubin and hemoglobin levels reached normal.

Discussion

Sensitization to antigens other than anti D is not uncommon and can cause severe hemolytic disease of newborn.

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Table 1 ABO and Rh phenotypes of the patient and the family

Newborn	O Rh (D+ C+ E− c+ e+)
Mother	O Rh (D+ C+ E− c− e+)
Father	A Rh(D− C− E− c+ e+)

Table 2 Antibody screening results

Sample	Coombs Phase 3 cell panel	Enzyme phase	Room temperature	4 °C	Auto control
Mother	Positive (0 3+ 3+)	Positive	Negative	Negative	Negative
Eluate from baby's red blood cells	Positive (0 3+ 3+)	Positive	Negative	Negative	Negative

In this article, we have reported a case of severe hyperbilirubinemia in a neonate due to anti c. The neonate was initially managed by intensive phototherapy. High unconjugated bilirubin indicated the need for exchange transfusion in this case. However, timely exchange transfusion could not be performed because of unavailability of compatible blood at the primary center where the baby was born. Identification of antibody and selection of blood unit lacking particular antigen takes usually a full working day. Though it is recommended that all pregnant women be ABO and D typed and screened for the presence of red cell antibodies early in pregnancy and at 28 weeks gestation, it is not being implemented universally [1]. Hence, routine antibody screening in the antenatal period paves the way for the timely treatment of HDFN caused by red cell antibodies.

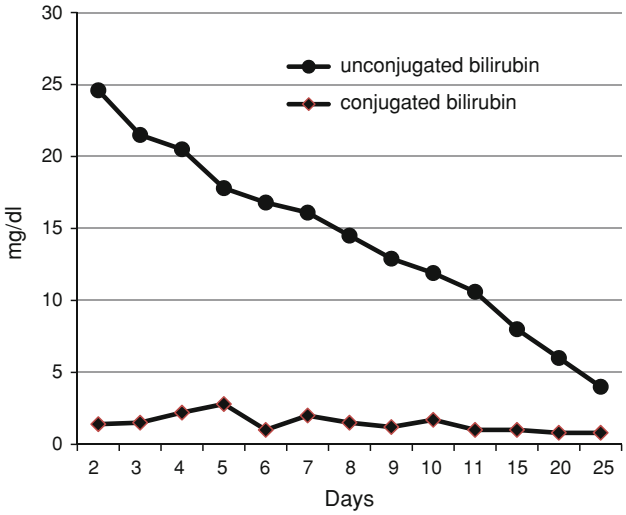

Fig. 1 Timeline displaying baby's bilirubin level

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