

ANOTHER CASE OF HDN WITH A NEGATIVE MATERNAL ANTIBODY SCREEN

Case Study by Jim Perkins (©2010)

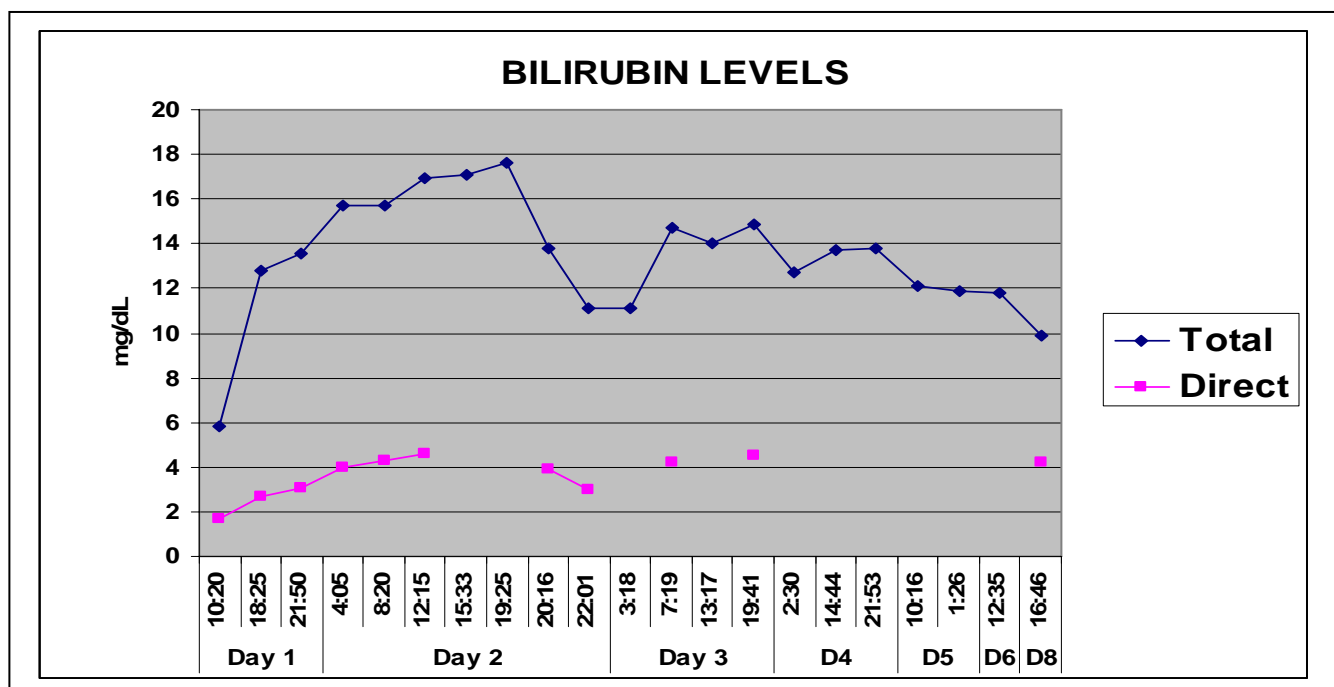
A 35 year old, G1P0 African woman was admitted in labor at 40 weeks, 5 days gestation. She had a positive hepatitis B surface antigen (HBSAg) test but was otherwise healthy without complications during pregnancy. Her blood type was O, and she had a negative blood group antibody detection test.

She received oxytocin to regulate her contractions. The membranes ruptured spontaneously revealing meconium staining. Fetal heart monitoring documented decelerations occurring with each contraction, so an urgent caesarian section was performed.

At delivery the umbilical cord was found to be tightly knotted around the neck. The female infant weighed 7lb, 15 oz (3609 gm) and had Apgar scores of 7 at 1 minute and 9 at 5 minutes. Cord blood testing revealed the infant to be blood type A, Rh negative, with a 1+ positive DAT. (A cord blood sample is submitted to the blood bank for blood typing and a DAT for all infants of type O mothers.) A cord blood total bilirubin level was 5.8 mg/dL with a direct-acting fraction of 1.7mg/dL. The infant was placed on intensive phototherapy at 6 hours of life. Hepatitis B immune globulin was administered and immunization was initiated. Bilirubin levels continued to climb rapidly (see graph). By the afternoon of the second day the infant's total bilirubin level was 16.9 mg/dL, so she was transferred to the neonatal intensive care unit at our hospital for exchange transfusion.

The neonatal jaundice prompted performance of additional immunohematologic studies. Evaluation of a peripheral blood specimen showed similar values. The blood group antibody screen was negative. A Lui eluate of the infants RBCs contained anti-A, and anti-A was demonstrated in the serum (3+ agglutination at immediate spin testing with A1 RBCs). The mother's serum failed to react with multiple RBC samples bearing low frequency antigens including V, Vw, Js(a), Go(a), He, Wr(a), Di(a), Yt(b), and Lu(a).

"Reconstituted whole blood" (group O negative RBCs, group AB plasma) was prepared for exchange transfusion. The infant's estimated blood volume was 307 mL (85 mL/kg x 3.616 kg). A total of 356 mL was exchanged in 10 mL aliquots via an umbilical catheter. The total bilirubin level was 17.6 mg/dL at the start of the exchange, falling to 13.8 at its midpoint and 11.1 at the end. Nine hours later the level was 14.7 mg/dL, but it slowly declined thereafter. The infant was discharged on its fifth day of life.



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QUESTIONS:

1. What do you think was the cause of this infant's hemolysis? Is this a typical case of this entity? Are there any other possibilities? (Hint: why was the additional maternal testing performed?)

2. What special preparation of the blood should be performed for an exchange transfusion? Why do you suppose a "double volume" exchange was not performed?

3. Why did the bilirubin level rebound so quickly after the transfusion?