Türk Kadın Sağlığı ve Neonatoloji Dergisi

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Case Report

A Neonate with Severe Hemolytic Disease Treated With Repeated Doses of Intravenous Immunoglobulin and Erythrocyte Transfusion Due to Anti-E, C and Kell Isoimmunization

Bir Yenidoğanda Tekrarlayan Intravenöz Immünoglobulin ve Eritrosit Transfüzyonu ile Tedavi Edilen Anti-E, C ve Kell İzoimmünizasyonuna Bağlı Ciddi Hemolitik Hastalık

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Abstract

Maternal Ig-G type blood group antibodies other than Rhesus D (RhD) are an increasingly significant cause of alloimmune hemolytic disease of the newborn (HDN). Anti-E, c and Kell associated HDN has not been reported in the literature. We report first case report of this combination with severe hemolytic anemia and hyperbilirubinemia requiring repeated doses of intravenous immunoglobulin (IVIG) and erythrocyte transfusion. He received 1 g/kg IVIG therapy on postnatal day 2 and 3 because of hemolysis. Erythrocyte transfusion was performed on postnatal day 6. Third dose IVIG as 1 gr/kg was given because of ongoing hemolysis on postnatal day 12. Three weeks after discharge he had no hemolysis. In conclusion, isoimmunization due to combination of subgroup incompatibility such as anti-E, c and Kell should be considered in patients with hemolysis, anemia and jaundice although combination of these isoimmunization is rare. Phototherapy, IVIG and erythrocyte transfusion are treatment options.

Keywords: Newborn isoimmunization; anti-E; anti-c; anti-Kell; IVIG

Öz

Yenidoğanın alloimmün hemolitik hastalığının (YHH) etiyolojisinde Rhesus D dışındaki antikorların önemi giderek artmaktadır. Anti E, c ve Kell antikorlarının birlikte olduğu YHH daha önce bildirilmemiştir. Bu olgu sunumunda ciddi hemolitik hastalık ve sarılık nedeni ile tekrarlayan intravenöz immunoglobulin (İVİG) ve eritrosit transfüzyonu ile tedavi edilen bir vakayı sunmak istedik. Erkek yenidoğana doğumdan sonra 2 ve 3. günde 1 gr/kg IVIG verildi. Eritrosit transfüzyonu 6. günde yapıldı. Postnatal 12. günde hemoliz bulgularının devam etmesi üzerine 3. doz İVİG 1 gr/kg dozunda verildi. Taburculuk sonrası 3. haftada hemoliz bulguları saptanmadı. Sonuç olarak hemoliz, anemi ve sarılık saptanan yenidoğanlarda nadir olsa da birden fazla subgrup uyuşmazlığının olması akla gelmelidir. Fototerapi, İVİG ve eritrosit transfüzyonu tedavi seçenekleri arasındadır.

Anahtar Kelimeler: Yenidoğanda izoimmünizasyon; anti-E; anti-c; anti-Kell; İVİG

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1. Introduction

Maternal Ig-G type blood group antibodies other than Rhesus D (RhD) are an increasingly significant cause of alloimmune hemolytic disease of the newborn (HDN) in the era of RhD immune globulin treatment (1). Antibodies such as anti-c, C, e, E, Kell are responsible for the variable degree of hemolysis and anemia. Combination of these antibodies were reported in the literature (2, 3).

We report first case report of a neonate with severe hemolytic anemia and hyperbilirubinemia due to anti-E, c and Kell antibodies requiring repeated doses of intravenous immunoglobulin (IVIG) and erythrocyte transfusion.

2. Case Report

A 38 years of age mother had a 3520 gr boy after 39 gestational weeks from her third pregnancy with cesarean section in Etlik Zubeyde Hanim Women's Health Teaching and Research Hospital. Maternal history, prenatal labs and family history were unremarkable. She had no blood transfusion history. Her blood group was B Rh positive. No icterus or anemia history had been recorded for her other children.

He had icterus on postnatal 24th hour. Total bilirubin, hemoglobin, hematocrit and reticulocyte count were 18.5 mg/dl, 11.8 g/dl, 35.5% and 10.6%, respectively. His blood group was B Rh positive and direct coombs test was 3 positive. A subgroup analysis revealed E, c and Kell incompatibility. He received 1 gr/kg IVIG on the first day of admission after 6 hours of phototherapy because of hemolysis and hyperbilirubinemia. Second dose of IVIG as 1 gr/kg was given on 2nd day of admission because of decreased hemoglobin as 9.7 mg/dl and increased total bilirubin as 21.1 mg/dl showing ongoing hemolysis. He was transfused with subgroup compatible packed red blood cells on postnatal day 6. Third dose IVIG as 1 gr/kg was given because of ongoing hemolysis on postnatal day 12. He was discharged on postnatal day 15 and three weeks after discharge he had no hemolysis.

3. Discussion

We present a newborn with severe HDN due to a combination of 'E, c and Kell' isoimmunization, the first such report to our knowledge. We performed a direct antiglobulin test regardless of the mother's blood type because of severe anemia and hyperbilirubinemia of patient.

The highly homologous RHD and RHCE genes, localized on chromosome lp34.3-p36.1, encode the Rh proteins, Rh D and Rh CE (4). One gene carries the D antigen and the other carries CE antigens in various combinations (ce, Ce, cE, CE) with the E and e antigens differing by one amino acid, Pro226Ala (4). Anti-e has not been noted as a cause of HDN such as other non-D Rh antigens (1, 5). There are limited reports of severe HDN due to combination of these antibodies in the literature.

Anti-E, C and c antibodies were reported to be usually associated with mild hemolysis whereas Anti-Kell antibody may lead to severe HDN (2, 3). Babinszki et al. reported a newborn with severe HDN due to anti-E and c isoimmunization treated with intrauterine transfusions, 11 exchange transfusions, erythrocyte transfusions and phototherapy (6). In another case report, a newborn with anti-E and c isoimmunization needed exchange transfusion, erythrocyte transfusion and phototherapy (7). Farnault et al. reported a mild anti-E and c isoimmunization treated with phototherapy (8). Dajak et al. found combination of anti-E and c antibodies in 3 of 355 pregnant women (3). In the literature combination of three antibodies such as our patient was not reported. Our patient had anti-E, c and Kell antibodies with severe HDN requiring multiple dose IVIG treatment, phototherapy and erythrocyte transfusion. In previous reports, authors did not use IVIG. This may be explained as these cases was before introducing of IVIG in HDN.

IVIG has been used more commonly for treatment of infants with HDN. IVIG reduces the need for exchange transfusion in newborn infants with isoimmune hemolysis due to Rh and ABO incompatibility (9). A recent study by Demirel et al. showed that IVIG did not affect exchange transfusion, need of erythrocyte transfusion and hospitalization time when used in combination with LED phototherapy in the treatment of ABO hemolytic jaundice in neonates (10). But, IVIG still remains an important therapy option in isoimmunization of infants. Onesimo et al. used IVIG to treat anti-E hemolytic disease in a newborn (11). Phototherapy should be combined with IVIG. Anemia should be treated with packed red blood cell or exchange transfusion. Patients should be followed for ongoing hemolysis. Karagol et al. has recommended minor group antibody screening both in the mother and the high-risk infants with hyperbilirubinemia and hemolytic disease of the newborn (12).

In conclusion, isoimmunization due to subgroup incompatibility including combination of antibodies such as anti-E, c and Kell in our patient should be considered in patients with hemolysis, anemia and jaundice. Phototherapy, IVIG and erythrocyte transfusion are treatment options.

Author contribution

Study conception and design: HY, IHÇ, and BÖ; data collection: HY, IHÇ, SK, and SS; analysis and interpretation of results: SK, AYB, and ND; draft manuscript preparation: ND, AYB, SK, and BÖ. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The written consent was received while admitting to the hospital.

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Conflict of interest

The authors declare that there is no conflict of interest.

Yazar katkısı

Araştırma fikri ve tasarımı: HY, IHÇ ve BÖ; veri toplama: HY, IHÇ, SK ve SS; sonuçların analizi ve yorumlanması: SK, AYB, ve ND; araştırma metnini hazırlama: ND, AYB, SK ve BÖ. Tüm yazarlar araştırma sonuçlarını gözden geçirdi ve araştırmanın son halini onayladı.

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