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Review of the postnatal management of infants following positive direct antiglobulin test

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Dear Editor,

Haemolytic Disease of the Foetus and Newborn (HDFN) is caused by maternal alloimmunisation against red blood cell antigens,[1] and the direct antiglobulin test (DAT) is used for identification.[2] Clinical outcomes vary, ranging from mild jaundice to kernicterus and death. Antenatal monitoring guidance is available[3] and includes the identification of antibody levels, referral to fetal medicine specialist, and review of Doppler ultrasound. Antibody quantifications and titrations are used to guide management, e.g. for anti-D a quantification < 4 iu/l – HDFN is unlikely, 4 – 15 iu/l – moderate risk of HDFN, and > 15 iu/l – high risk of HDFN. Anti-c quantifications of > 7.5 – 20 iu/l have a moderate risk of developing HDFN, and concentrations > 20 iu/l have a high risk of HDFN. A titre of ≥32 is significant for all other antibodies.[3]

We wished to review our postnatal management of infants following positive DAT. We identified positive DAT results from laboratories in our tertiary maternity hospital over a 1-year period. We conducted a retrospective chart review of electronic medical records, and audited management against our protocol. Serum bilirubin measurements were interpreted using the NICE Guideline for Jaundice in Neonates.[4] From July 2021 – July 2022, 394 positive DATs were collected; 6 (2%) patients had DAT4+, 7 (2%) patients DAT3+, 85 (21%) patients DAT2+, and 296 (75%) patients DAT1+.

Among the DAT4+ group (n=6), anti-D +/- anti-C antibodies were the most commonly identified. All infants had antenatal quantifications in the moderate-high risk levels (levels 5-160 iu); anti-c levels for one patient reached 110iu/l. All infants were directly admitted to the neonatal intensive care unit and had an early bilirubin sent. All infants in this cohort had prophylactic phototherapy commenced. Four of 6 infants received intravenous immunoglobulin, 5 of 6 infants received postnatal red cell transfusions, and no patient in this group received an exchange transfusion. All patients were prescribed folic acid postnatally. The mean (SD) duration of stay was 9.8 (2) days.

Among the DAT3+ group (n=6), all patients had antenatal levels at low-risk range. Anti-D, anti-E, anti-c, anti-Cw, and anti-S antibodies were present. Two infants were admitted to the

neonatal intensive care unit. All infants had serum bilirubin samples below the phototherapy threshold.

Among those with DAT2+ and DAT1+, phototherapy was commenced for 13 (15%) and 18 (6%) patients respectively. A positive DAT was due to ABO incompatibility in 10.7% (9) in the DAT2+ and 6% (18) in the DAT1+ group. Maternal anti-D immunoglobulin administration was found in 72.6% (61) in the DAT2+ group and 91.5% (271) in the DAT1+ group.

We found that newborns at greatest risk of HDFN were recognised antenatally and appropriately admitted to the neonatal unit. Those at greatest risk for HDFN all had moderate-high risk levels antenatally. Education on antibody significance may improve management in those with low risk levels. In our study, infants with a DAT3+ result had maternal antibodies present at a low risk level, though two were admitted to the neonatal unit for phototherapy, despite never reaching phototherapy threshold. Ongoing education is warranted.

Declarations of Conflicts of Interest:
None declared.

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