ABO Hemolytic Disease of the Fetus and Newborn

ABO Hemolytic Disease of the fetus and newborn is caused by ABO incompatibilities between the mother and fetus or newborn. This can occur when the mother has O type blood while the fetus has type A or B. The mother will produce anti-A or anti-B antibodies which attack fetal/neonatal red blood cells resulting in hemolytic anemia. This disease is most often asymptomatic, but can also present as neonatal jaundice. Diagnostically, a Coombs test will be negative or weakly positive. Management is primarily with phototherapy, but transfusion may be necessary.



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Characteristics

ABO Incompatibilities

(A) Apple, (B) Bee, (O) Owl Blood Cells with Incompatible-X

ABO incompatibilities are present in ~20% of all pregnancies, however only 5-10% of newborns are symptomatic. The highest risk is with type O mothers and type A or B newborns.

Type O Mother and Type A/B Fetus

(O) Owl Pregnant-woman and (A) Apple with (B) Bee Fetus

The highest risk for ABO incompatibility involves blood type O mothers and blood type A or B newborns.

Anti-A or Anti-B Antibodies

Anti-tie (A) Apple or Anti-tie (B) Bee with Ant-tie-bodies

The presence of pre-existing maternal antibodies (anti-A or anti-B IgG) are able to cross the placenta and can result in hemolysis in the fetus. As these pre-existing antibodies are present even if sensitization has not occurred, hemolysis can commence even during the first pregnancy.

Hemolytic Anemia

Hemolyzing-RBCs from Anemone

Neonatal hemolytic anemia can occur due to the hemolysis of RBCs in the fetus. The anti-A or anti-B antibodies from the mother may cross the placenta and start binding to fetal RBCs, tagging them for lysis. Overall though, ABO incompatibility usually has a significantly milder course of disease compared to Rh incompatibility.

Presentation

Often Asymptomatic

Thumbs-up

ABO hemolytic disease often presents asymptomatically, but if the number of lysed RBCs is significant, findings like anemia, hyperbilirubinemia, and jaundice may occur.

Neonatal Jaundice

Newborn Jaundice-janitor

Mild neonatal jaundice can present at birth or within 24 hours after birth.

Diagnosis

Negative Coombs Test

Negative Comb

If there are signs of hemolysis postnatally, a Coombs test can be conducted. ABO incompatibilities will have a mostly negative or weakly positive Coombs test because macrophages will phagocytose most antibody-bound RBCs so very little agglutination occurs.

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Management

Phototherapy

Photo-flash

Postnatal treatment includes phototherapy and, if necessary, transfusion with RBCs can be used to address hyperbilirubinemia. Additionally, iron supplementation can ameliorate the symptoms of neonatal hemolytic anemia.

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