

Rhesus Blood Group. Haemolytic Disease of the Newborn

Rhesus blood group:

1. This is a blood group that has clinical importance in transplantations and hemolytic disease of the newborn.
2. The name of this group comes from the Rhesus monkeys that was used to experiment to discover this blood group.
3. The Rh blood group system involves 3 sets of closely linked antigens: Cc, Ee, Dd.
4. D is very strongly antigenic. It is a polypeptide encoded by the RHD gene on chromosome 1.

for practical purposes, individuals are divided into 2 types:

- Rh positive – possessing the D antigen (DD or Dd)
- Rh negative – lacking the D antigen (dd)

Rhesus hemolytic disease of the newborn:

In the case of an Rh negative mother carrying an Rh positive fetus, red cells of the fetus can enter the mother's circulation. When the above occurs, the mother can

become immunized (=formation of anti D antibodies by the mother's body, which can cross the placenta and enter the fetal circulation. And thereby cause hemolysis of

the fetal red blood cells.

This action can cause one of those 2 cases:

1. Fetal death , also known as erythroblastosis fetalis
2. Hemolytic anemia of the newborn infants.
 - It is important to note that in the case of an Rh negative mother and an Rh positive fetus, In the first pregnancy it is less dangerous for the fetus, since most chances

are that the mother hasn't been sensitized yet, but in the second pregnancy it is much more dangerous to the fetus with Rh positive because the mother may have

already been sensitized in the previous pregnancy, and produced antibodies in a sufficient amount to attack and harm the fetal blood supply.

Treatment:

In case it occurs and the antibodies of the mother attack the fetal blood supply it can be treated by exchanging fetus's blood with Rh negative.

Prevention:

Prevention Can be done by injecting Anti-D to the mother at 28-32 weeks of gestation and again after pregnancy . (the anti D globulin injected will wear off within 4-6

weeks). The mechanisms are still poorly understood, but:

1. It kills the red blood cells of the fetus that may have gone through placenta, so the immune system of the mother does not even recognize them yet.
2. Prevents B-cells of the mother from producing the antibodies.

Important: It is a routine to screen all Rh-negative women during pregnancy for the development of Rh antibodies.

References:

EMERY'S elements of medical genetics

GUYTON AND HALL testbook of medical physiology.

