Rh Incompatibility in Pregnancy [1]

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Rh incompatibility occurs when a pregnant woman whose blood type is Rh-negative is exposed to Rh-positive blood from her fetus, leading to the mother's development of Rh antibodies. These antibodies have the potential to cross the placenta and attach to fetal red blood cells, resulting in hemolysis, or destruction of the fetus's red blood cells. This causes the fetus to become anemic, which can lead to hemolytic disease of the newborn. In severe cases, an intrauterine blood transfusion for the fetus may be required to correct the anemia.

The first case involving Rh incompatibility was reported in 1939, although the Rh factor, a protein found on the surface of red blood cells, had not yet been discovered. This first case was reported by immunohematologist, Philip Levine and physician, Rufus Stetson, who published their case in The Journal of the American Medical Association. The authors presented an anonymous, twenty-five year old woman who checked into a local hospital during her thirty-third week of pregnancy complaining of labor pains and vaginal bleeding. The next day, she delivered an emaciated, stillborn fetus weighing only one pound and five ounces. The physicians had to expel the woman's placenta to stop her from bleeding to death. The patient received a blood transfusion from her husband, as the two of them were of blood-type O. Ten minutes after completing the transfusion, the patient developed a chill and began feeling pain in her head and legs. When her vaginal bleeding resumed she was given a hysterectomy, followed by another blood transfusion from a different donor. Throughout her entire visit, the patient received transfusions from 104 Type O blood donors. Remarkably, the mother showed no blood transfusion reaction to twenty-one of those donors. Further tests indicated that the patient's serum, or the plasma in the blood minus the clotting factors, specifically agglutinated her donors' cells—or rather, 80 percent of all her blood transfusions.

It was not until a year later, Karl Landsteiner and Alexander S. Wiener coined the term “Rh factor” as the cause of the isoimmunization. They originally believed that Macacus rhesus, or Rhesus monkey, contained the same red blood cell surface antigen (Rh) as the one found in human red blood cells. This was soon proven wrong, as the composition of human sera and
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