ON A SEARCH FOR RHESUS ANTIBODIES IN VERY YOUNG FOETUSES

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The first Rh-sensitized pregnancies of Rh-negative women do not end in death of the embryo or foetus more often than do the pregnancies of other women. In subsequent sensitized pregnancies the death rate of Rh-positive foetuses is markedly increased. These latter foetal deaths always occur in the second half, and most of them in the last third, of pregnancy: Rh-sensitization is not a cause of death of the embryo or of the foetus under about 20 weeks. The reason for this is unknown, but it has been suggested that the maternal antibodies do not reach the embryo or the foetus in the early weeks of gestation. I have recently had the opportunity of examining a young foetus from each of two sensitized Rh-negative women: the following are my observations on them.

Case 1

The husband was AB, CDe cDE, the wife A, cde cde. The woman had had anti-Rh antibodies since the time of her first pregnancy in 1946; at the time of the expulsion of the foetus to be discussed the titre was 2 in albumin, a trace in saline. The foetus was the product of her fourth pregnancy and was aborted spontaneously at about 10 weeks in March, 1954: the placenta and membranes were missing.

The foetus measured 59 mm. in crown-rump length, weighed 9.8 g. and appeared normal externally. There was no maceration. Blood was obtained from the cord and from the heart, and was in good condition. The red cells were Group A, Rh-positive (CDe cde), direct-Coombs negative, but strongly indirect-Coombs positive with incomplete anti-D. We have observed that the fluid from the various body cavities and from the skin blebs of stillborn foetuses contain Rh antibodies if the blood contains them. Two drops of clear, pale yellow fluid were obtained from each pleural cavity of the present foetus. This fluid did not agglutinate Rh-positive red cells by the saline, albumin or indirect Coombs method. The foetal tissues, now largely drained of blood, were homogenized in a waring blender with double their weight of saline. The filtrate did not agglutinate Rh-positive red cells by any method.

The maternal antibody could not be shown to be present in the foetus, but this is not surprising since the antibody had a titre of only 2. The red cells of the foetus were capable of absorbing both complete and incomplete Rh antibody. The abortion is not to be ascribed to Rh sensitization.

Case 2

The woman was O, cde cde. Rh antibodies had been present since 1947 during her fourth pregnancy; at the time of the removal of the foetus to be discussed the titre was 64 in albumin, 1 in saline. The foetus was the product of her eleventh pregnancy for eight of which, including this one, her husband was not the father. He is Rh-negative (O, cde cde). Hysterectomy was carried out at six weeks in December, 1954, on the recommendation of a consulting psychiatrist.

I received the intact ovum direct from the operating room. Taking care not to manipulate the placenta I made a small incision into the amniotic sac, introduced a large-bore needle attached to a syringe and tried to aspirate the fluid. I could obtain only a drop or two of fluid at a time, the needle then becoming obstructed by transparent filaments I could not see. This fluid was pale yellow. After repeated failure to obtain fluid in quantity in this way I opened the sac more widely, placed the tip of the needle in its most dependent point and readily withdrew 5 ml. of water-clear, colourless fluid. My impression was that there were two compartments in the sac, one possibly loculated and containing pale yellow fluid, the other fully open and containing colourless fluid. Whether the pigment in the first fluid had any pathological significance I cannot say: it was not examined for bile pigments. I now clamped the cord at both ends and removed the foetus and cord from the sac.

The crown-rump length of the foetus was 32 mm.; its weight, 2.59 g. The cord blood was A, cDE cde, direct-Coombs positive. I opened the body, obtained two or three drops of blood with a Pasteur pipette, spun this down, recovered a small drop of serum, diluted this with an equal quantity of saline and set the mixture up with group A, Rh-positive and group A, Rh-negative cells in parallel for an indirect Coombs test. The

Rh-positive cells were strongly agglutinated; the Rh-negative cells were not agglutinated. There was no serum left to carry titration farther.

The maternal antibody had already reached the foetal circulation at this early age: part was attached to the red cells, part free in the plasma. The presence of the antibody in the foetal circulation was not the result of the surgical manipulation of the uterus or the ovum, for, had it been, maternal anti-A as well as anti-D would have been present. No anti-A was demonstrable. No conclusion can be reached about the significance of the pigment in the amniotic fluid.

Summary

Two Rh-positive foetuses of sensitized Rh-negative women were examined. In the first case the mother had an anti-Rh albumin antibody with a titre of 2. The foetus was about 10 weeks old. No antibody could be demonstrated in its blood or tissue fluids. In the second case the mother had a titre of 64; the foetal cells were direct-Coombs positive; the serum contained anti-Rh albumin antibody. A portion of the amniotic fluid of the latter foetus was palely yellow.

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