BREAST-FEEDING IN ERYTHROBLASTOSIS FOETALIS*

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Rh antibodies are frequently demonstrable in the breast milk of mothers who have borne erythroblastotic babies, and the suggestion has several times been made that the ingestion of such milk might have a deleterious effect upon the recovery of an infant whose blood cells had already been subjected to the action of maternal antibody. More recently Cappell (1946) and Davies (1947) have reported cases in which a lag in recovery in the blood state of babies with erythroblastosis foetalis was apparently overcome by weaning.

If this view is correct it should be possible to show that antibodies are not destroyed by gastric juice and that they are absorbed into the circulation. As the question of weaning or breast-feeding in these cases is of considerable importance the following investigations were undertaken to try to determine which course should be pursued.

Investigations

The fasting gastric contents were obtained from 20 babies varying in age from 1 week to 1 year; a wide range of gastric acidity was present. Equal volumes of gastric secretion and serum with a high Rh antibody titre were incubated together. At the end of an hour's incubation at 37° C. no fall in titre was found in any case, indicating that Rh antibodies are not readily destroyed by the gastric juice.

To try to demonstrate absorption from the stomach, serum containing antibodies was fed by mouth, and blood samples were taken at intervals thereafter and tested for antibodies. In each case Rh antibody was used which had been shown previously *in vitro* to be able to agglutinate the red cells of the recipient. Absorption was tested for by the ability of the serum to agglutinate red cells of the same Rh type, and at the same time blood counts were done to check the possibility of any *in vivo* agglutination leading to anaemia. The red cells were tested for sensitization by the direct method, and in all cases the power of the serum to sensitize other Rh-positive cells was investigated by the indirect method of Coombs, Mourant, and Race (1945). These are much more sensitive methods than the ordinary tests for agglutinins, the rabbit anti-human globulin serum detecting traces of antibody when direct agglutinating techniques are completely negative.

First, an Rh-positive volunteer drank 15 oz. (426 ml.) of serum with an anti-Rh titre of 256 without any untoward results. There was no fall in the blood count, and blood taken at intervals during the next 48 hours showed no agglutinin. The cells did not become sensitized and the serum failed to sensitize other Rh-positive cells.

Next, 12 Rh-positive babies suffering from such conditions as inoperable spina bifida were fed for a complete day with high-titre serum—again with complete failure to demonstrate any antibody absorption.

Thirdly, the direct Coombs test was done daily on a baby with erythroblastosis. On the day the test became negative traces of antibody undetectable by the most sensitive methods might reasonably be assumed to have been present. On this day and for the subsequent 24 hours only high-titre serum was fed, and again no sensitization of the red cells occurred and no antibody could be demonstrated.

Lest there might be some difference between the absorption of antibodies from serum and breast milk the same investigation was carried out, but on the day the Coombs test became negative the baby was put on to breast milk containing an anti-Rh titre of 32. The baby's red cells did not become resensitized, and antibody was not otherwise demonstrable in the serum.

In these investigations complete antibody was used. The series was completed by repeating the observations on babies with haemolytic disease but using incomplete or blocking antibody. Again no evidence of absorption was found.

Comment

Infants suffering from erythroblastosis, of either icteric or haemolytic preponderance, differ widely in the severity of the disease and in their response to blood transfusion therapy. Whereas in some a single transfusion will produce a satisfactory blood level which is maintained, in others the haemolytic process appears to continue after the red cells are no longer sensitized by agglutinin and, indeed, at times when all the original cells have been demonstrably replaced by group O Rh-negative blood. Yet in these refractory cases there is usually a point when lysis ceases, transfused cells are maintained, and the blood count starts to rise of its own accord. In view of the failure to show any absorption of mouth-fed antibody into the infant's blood it may be that in those cases where weaning has appeared to overcome a refractory anaemia the time of weaning has coincided with the time of spontaneous recovery, and that the relationship between the two is more apparent than real.

The same rather dramatic onset of blood regeneration in the more refractory cases may sometimes be observed in infants breast-fed from birth, and also in others which have been only artificially fed. This regeneration characteristically is seen in the second month of life, a time when weaning to avoid breast-milk antibodies has appeared to effect an improvement.

It is possible, as Emery (1947) suggests, that traces of antibody insufficient to be harmful may be absorbed, but if so they are not detectable by present methods. The advantages of natural over artificial foods need no elaboration, and for an erythroblastotic baby with haemolytic anaemia and a depressed marrow the disadvantages of artificial feeding should be avoided so far as is possible. It has been the practice at the Hospital for Sick Children to breast-feed such infants whenever this can be done, irrespective of the breast-milk antibody content, and their clinical progress has not suggested any relationship between milk antibodies and the duration of the haemolytic process.

Summary and Conclusion

Investigations are described which show that Rh antibodies, although not readily destroyed in the stomach of infants, are not demonstrably absorbed into the blood stream.

It is concluded that the weaning of infants with haemolytic disease because the maternal milk contains antibodies is not justified.

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