ERYTHROBLASTOSIS FETALIS AS A CAUSE OF INFANTILE MORTALITY*

A Preliminary Report

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THE present study is based on 10 cases which have been observed at the Woman's Clinic. Time does not permit a detailed report. Therefore, these remarks must be construed as a preliminary report. Studies are now in progress, and will form the basis of a subsequent communication.

The maternal records may be summarized as follows: The mothers averaged thirty-one years in age. Mediterranean ancestry was noted in 50 per cent of the cases. Multiparity was present in 9 cases. No familial incidence of the disease was observed. The Wassermann was negative in all. The hemoglobin averaged 83 per cent. Pregnancy was complicated by a poor weight gain in 50 per cent of the cases, and suggests a nutritional basis. An achlorhydria was found in one case so studied. The duration of pregnancy ranged from thirty-four to forty weeks with an average of thirty-seven weeks, indicating slight prematurity. Analgesia was used in 4 cases, and nitrous oxide anesthesia in 8 cases. Labor was short with an average duration of nine hours, of which the second stage was less than one hour. Delivery was spontaneous in 7 cases. Fetal distress was observed in 3 cases; 2 of which occurred in the second stage, while nitrous oxide was being administered. Both of these infants were delivered with forceps in order to obtain a living baby, but to no avail. The amniotic fluid had an amber color in 4 cases. A presumptive diagnosis of erythroblastosis was made before delivery in one case, and this case will be reported at a later date.

The placentas averaged 775 gm. in weight, which is about one-sixth heavier than normal. The fetal surface was distinctly yellow in 3 cases. On histologic section, erythroblasts were found in the fetal vessels.

The infants' records will now be reviewed. The sexes were about equal. The average weight was 3,457 gm. (7.5 pounds), which is excessive for infants of thirty-seven weeks' gestation. The edema and fluid in the serous cavities added to the increased weight. Resuscitation was necessary in 50 per cent of the infants. The rôle of analgesia and anesthesia in producing asphyxia can only be inferred. Edema was

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noted in 3 cases, icterus in 5, pallor in 4, dyspnea in 6, and cyanosis in 5 cases. Convulsions were present in 3 cases, and a heart murmur in 2. Skin petechiae were frequently observed, and bleeding from the mouth and rectum was seen in 2 cases. The liver and spleen were usually enlarged.

The lowest red cell count was 1,300,000 per c. mm., with an average for the group of 3,400,000. The average hemoglobin was 51 per cent. The color index was 1.5. The nucleated elements ranged from 23,000 to 256,000 per c. mm.; of which 6 to 362 per cent were nucleated red cells.

The mortality was 70 per cent. The treatment was repeated transfusions. The 3 patients that survived received 9, 7, and 4 transfusions, respectively, in the first days of life. Within two weeks, the nucleated red cells had disappeared. These infants are now living and well. In England, Hampson uses human blood serum intramuscularly, with a mortality of only 6 per cent.

Autopsies were performed in 7 cases. The liver and spleen were invariably enlarged because of the hemopoietic hyperplasia. All patients showed an enlargement of the heart, and no cause for the cardiac murmur was found. Fluid was often present in the serous cavities, particularly in the pleural space, thereby contributing to the dyspnea and cyanosis. Petechiae were frequently observed on the mucosal and serosal surfaces. In the 3 patients that had convulsions, 2 had subarachnoidal hemorrhage, and the third had "kernicterus."

To recapitulate, erythroblastosis runs part of its course intra utero, and is recognizable at birth. The obstetrician is in a strategic position for diagnosis. His suspicions are aroused before delivery by the racial aspects, and a history of familial jaundice. A poor weight gain and an achlorhydria may also be premonitory. Hydramnios may be present. Diminished or absent fetal activity is suggestive. Fetal distress may occur. The amber-colored fluid when the membranes rupture is important. After making a presumptive diagnosis of erythroblastosis in the unborn child, all analgesia is interdicted, although rectal ether without quinine may be used for fetal distress. At the time of delivery, no nitrous oxide should be administered. Open drop ether may be used, although no anesthesia is preferred. The diagnosis is established after delivery by the deep yellow vernix, or the presence of hydrops. A palpable liver and spleen are confirmatory. The increased size of the placenta, with a yellow fetal surface or an edematous appearance, is additional evidence. Erythroblasts in the blood smear, and in the fetal capillaries of the placenta, complete the diagnosis.

Other conditions must be differentiated. Prematurity is associated with an increased number of nucleated red cells. Sepsis and congenital syphilis must be considered. The skin petechiae may lead to an erroneous diagnosis of hemorrhagic disease. The collapse and cyanosis suggest

intracranial hemorrhage. The heart murmur presupposes a congenital lesion. The jaundice may lead to a conclusion of malformation of the biliary system. Aplastic anemia and leucemia must also be ruled out.

The incidence of erythroblastosis at the Woman's Clinic in 1936 was 1 in 400 infants. However, a study of the infantile mortality reveals even a greater incidence. Stander has advocated that all infants weighing over 1,500 gm., regardless of maceration or deformity, and those dying within the first fourteen days of life, be included in the total infant mortality rate. Of 110 infants so classified, 5 or 4.5 per cent were due to erythroblastosis. In the same year, 3 deaths were attributed to syphilis. Therefore, erythroblastosis exceeds syphilis as a cause of infantile mortality.

In conclusion, may I add that obstetricians are in a strategic position for the management of this condition, so that the present high mortality rate can be lowered appreciably.

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DISCUSSION

DR. ARTHUR M. REICH.—The condition of erythroblastosis fetalis may recur in more than one offspring from a particular mother, as was demonstrated in a case of a colleague of mine. This patient had her first labor sixteen years ago, resulting in a normal living child. The second baby had hydrops and died in the first days. Then there were three babies in successive confinements, all showing similar findings and results, namely, icterus of the newborn and death on the third day of life.

Five years ago this same woman was attended in her sixth confinement by my aforementioned colleague who had not attended her before, but was acquainted with the previous history. He had an immediate diagnosis made by a blood examination on the newborn child. A transfusion was performed at once, followed by subsequent transfusions. The baby recovered.

DR. JAVERT (closing).—There have been no cases of familial occurrence in our series, although there are descriptions in the literature, particularly by de Lange, of several instances of hydrops and icterus gravis in successive infants born to the same mother.