

## A Case of Anaemia in Premature Infant

### Case Report

Presented by Doctor Y. Salmon.

Regd. No. 2909. Born: 14th February 1956

Birth Weight: 3 pounds. Length 15"

Normal vertex delivery, labour lasted 15 hours 40 minutes.

Para 7. Maturity 27 weeks (other children were full-term, normally delivered and alive).

General condition at birth was satisfactory. No abnormality detected on examination.

#### AFTER CARE:

The baby was given the usual premature nursing care. Feeding was started after 36 hours, during which time the baby's condition remained good.

Ext. Thyroid Sic was given during the two periods when the baby was not taking its feed well; the general progress was good.

Jaundice was detected on the 6th day, became maximal on the 8th day and disappeared by the 17th day.

12th day: Septic spots on the anterior abdominal wall developed,

which were treated by Penicillin 20,000 units I/m. 6 hourly for 5 days.

23rd day: Thrush on the buccal mucosa was detected. This cleared up after three days local treatment with glycerine and borax and Gentian Violet 1%.

32nd day: The baby appeared pale and a blood count was done. Hb. 52%, T.R. 2.73 m. Clinical examination showed the spleen was not enlarged and the liver was palpable one finger-breadth below the costal margin. A course of Inj. Imferon  $\frac{1}{2}$  c.c. I/M. was then given daily for one week.

47th day: Any abscess formed on the left buttock at the site of the Imferon injections. This was incised 2 days later, and the wound healed. The baby was given oral iron but there was no improvement in the anaemia.

Lab. Investigations: Date	Blood T.R. (Mill)	Hb. % 100% 14.8 gm.	Reticulocytes %	Others
17th March 1956	2.73	52		Colour Index=0.9
19th March 1956	4.16	80		
20th March 1956		60	2	
23rd March 1956		63	2	
27th March 1956	2.73	58		
4th April 1956	2.56	54	4	
10th April 1956		55	3	
13th April 1956		51	5	
16th April 1956	3.28	60	5	T.W.16,000 P.84, L.8 M.4. E.4% Platelet count 280,000. Size of RBC. 7.5. Bleeding time 3 mins. Clotting time 3mins. 15secs. Fragility of RBC. Haemolysis begins at 0.4% NaCl. and is complete at 0.34% NaCl.
25th April 1956	2.80	55		T.W.8,800 P.48, L.40 M.8 E.4%.
25th April 1956	2.48	55	6	

**WEIGHT:** There was an initial weight loss of 7 ounces from 3 pounds at birth to 2 pounds 9 ounces on 14 day thereafter there was a gradual gain in weight to 5 pounds 3½ ounces on discharge.

Cephalin Cholesterol Flocculation test +++

1 minute bilirubin—Nil.

30 minute bilirubin—1.2 mgm. per 100 mi. serum.

Blood Group of Baby—Group "A" Rh. + ve. Direct Coomb's test negative.

Blood Group of Mother — Group "O" Rh. + ve. Indirect Coomb's test negative. Kahn Test negative.

Blood Group of Father—Group "A.B." Rh. + ve.

Baby's blood contains 66% Hb. F. (Alkali denaturation).

Electrophoresis of Hb.—neither Hb. C nor Hb. S. detected.

Bone marrow smear—Normoblastic.

Urine—No bile, urobilin or urobilinogen detected.

The baby was discharged in a good clinical condition on 29th April 1956.

## Discussion

Doctor Field said that the normal Hb in a baby at 2 months is between 80/90% and the normal total Rbc. count is 4½ millions. The fragility test in newborn shows a wide field of haemolysis from 0.2%-5% NaCl. The reticulocyte count continued to be high in this baby. Normally in a newborn infant the count is high but by 1 month should be below .5%. The alkali denaturation between 2 and 4 months shows the change from foetal to adult Hb. A total of 66% Hb. F. at 2 months is normal. Anaemia in newborn infants is rare. Anaemia may occur at about three months, due to a haemolytic process, usually associated with the Rh. factor. In this case, however, there was no Rh. factor incompatibility.

The anaemia could be due to:—

1. Infection
2. Thrush.
3. Abscess.

Imferon is most effective in anaemia following gastro-enteritis and infection, but this was not so in this baby.

Other possible causes of the anaemia were:—

1. Idiopathic anaemia.
2. Anaemia following blood loss from the foetal side of the placenta.
3. Anaemia of prematurity. The infant's store of iron is largely acquired in the last trimester of pregnancy. This anaemia occurs after 3-4 months of age.

Doctor Goon suggested that this anaemia could have been due to prematurity plus a haemorrhage from foetal vessels just before birth. A.B.O. incompatibility was also a possibility.

Doctor Field said that there had been no response to the therapy.

Doctor Goon asked whether iron therapy is of use in anaemia of prematurity as the liver cannot utilise iron until three to four months.

Doctor Smith commented that the pallor was not noticed immediately and therefore placental loss was unlikely. Haemolysis due to A.B.O. incompatibility was possible. In haemolytic disease there is a lack of response to a stimulus of anaemia until the age of six weeks. In this case anaemia was probably due to defective blood formation enhanced by infection.

Doctor Field asked whether iron therapy is of value in haemolytic disease.

Doctor Smith said that iron therapy is of use only after six weeks.

Doctor Field asked why cases of gastro-enteritis responded to imferon therapy.

Doctor Smith replied that this infant presumably had a bone marrow that responded poorly. There are two types of anaemia of prematurity:

- (a) Early type occurring in the first six weeks due to inactivity of the bone marrow.
- (b) Due to iron deficiency and rapid increase in body weight and blood volume.

Doctor Goon suggested that it was worthwhile to examine blood for adult and foetal Hb. in any case where there was a large "show" to establish the source of the bleeding.

Doctor Sinha advised routine blood tests of babies in cases of A.P.H. and toxæmia. The babies are apparently well in most of these cases.

Doctor Field then gave a summary of the discussion.

## Case Report

Presented by Doctor Tay Kah Seng.

Regd. No. 6657.

The mother of this child was a booked case who was admitted on 10th April 1956. She was 29 years. Gravida 2, Para 1. First child delivered normally in China 8 years ago. On admission she was diagnosed as a case of pre-eclamptic toxæmia with anaemia. She was given routine toxæmia treatment with parenteral iron therapy.

*18th April:* Delivered following normal labour of 6½ hours duration, with a second stage of 20 minutes.

Condition of the baby at birth was good. Birth weight 8 pounds 3 ounces. There was slight degree of moulding. The head did not appear abnormally large. Heart and lungs clinically clear. No congenital abnormalities were detected.

### PROGRESS NOTES:

Patient was taking feeds well until *third day* when mother noticed that the baby was vomiting out some of its feeds. The vomitus contained brownish altered blood. He had a cerebral cry. The fontanelle was slightly full. Both upper and lower limbs were rigid. Patient was given Inj. Vitamin K. 5 mg. The temperature rose to 101°F. Heart and lungs were clinically normal. Penicillin 20,000 units 6 hourly I/M. was prescribed.

*4th day:* The baby still had a cerebral cry, and was seen by Doctor Field who confirmed the diagnosis of intracranial injury. Syrup Chloral 1 dr. 6 hourly was given and the head of the cot raised.

*5th day:* The pyrexia continued and there was no change in the general condition.

*7th day:* The head appeared large. The fontanelle was bulging and the sutures were widened. The head circumference was 16 inches. An X'ra y skull was taken.

*8th day:* A lumbar puncture was done and heavily blood stained C.S.F. obtained, not under increased pressure. The baby passed watery green stools 3 times and was put on oral streptomycin 125 mgm. 6 hourly. The head circumference was now 16½ inches. The baby was seen by Doctor Field again who diagnosed hydrocephalus due to haemorrhagic disease of the newborn.

*9th day:* A second lumbar puncture was done and the C.S.F. was still blood stained. C. S. F. analysis — T.P. 280, Glob. +, Sugar +, Chlor. 730. No organisms seen in deposit. Polys., lymphs few, R.B.C. ++++. The baby was still irritable and pyrexial.

*10th day:* The baby was feeding badly and the head circumference increased to 16½ inches.

*11th day:* The baby was transferred to General Hospital for Ventricular taps.

INVESTIGATIONS: T.R. = 4.94 m.  
Hb. = 94%  
T.W. = 15,000  
D.C. = P.84, L.12  
M.2, E.2%

Reticulocyte Count — 5%  
Prothrombin Time — 23 seconds  
Clotting Time — 4 mins. 20 secs.  
Bleeding time — 2 mins. 28 secs.  
Platelet Count — 180,000

Fragility test: Haemolysis begins at 0.42% NaCl and complete at 0.32% NaCl.

*Mother:* Group "AB" Rh. + ve  
Indirect Coomb's test negative  
No abnormal antibodies.

Father: Group "O" Rh. + ve.  
Mother KT — negative.  
Father KT — negative.

## Discussion

Doctor Field commented that in this case there was haemorrhage from the stomach and into the brain, possibly following a birth injury or haemorrhagic disease. Hydrocephalus was detected only on the 7th day and was of the acute type.

The haemorrhage was possibly the cause of the hydrocephalus. She asked whether maternal toxæmia and anaemia show any relationship to haemorrhagic disease of the newborn.

Doctor Sinha replied inherent weakness of vessels of the brain would predispose to haemorrhages.

Doctor Field thought that haemorrhagic disease of newborn very likely, in spite of negative blood findings. She asked whether a hydrocephalic foetus is predisposed to intracranial haemorrhage.

She summarised the *causes of Hydrocephalus*.

- (a) Excessive secretion or diminished absorption of C.S.F.
- (b) A block between 3rd and 4th ventricles which is not necessarily present at birth.

(c) Viral infections — which cause hydrocephalus with calcified nodules in the skull.

(d) Meningitis in the newborn.

Doctor Field suggested that in this case there was severe haemorrhage and that the block in the 3rd or 4th ventricle was caused by a blood clot.

Doctor Sinha suggested tapping, in order to prevent growth of head.

Suggestion for further investigations put forward were:—

- (a) Ventriculogram immediately.
- (b) Cerebral angiogram.
- (c) Surgery.

## SUBSEQUENT PROGRESS:

After transfer to the Paediatric Unit—General Hospital, this case was given a course of Cortisone to prevent fibrosis, organisation of blood clot. Ventricular taps were done to relieve the increased pressure. The block did not persist and the head ceased to grow. When last seen aged 6 months this infant was developing normally and the head circumference was normal.