

Partial Exchange transfusion in the treatment of severe anaemia in late pregnancy

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In Malaysia and Singapore, anaemia in pregnancy is common with reported incidences up to 25 to 30% (2,4). This is mainly of the iron-deficiency type secondary to nutritional causes. Such cases may be treated with oral or intramuscular iron, total dose infusion of Imferon or blood transfusion depending on the severity of anaemia. Most of the cases we see are mild to moderate in intensity. Severe anaemia (haemoglobin less than 6.5 g%) fortunately is uncommon, the incidences ranging from 1.5 to 3.1% (3, 4, 6).

This is in contrast to the very severe anaemias in pregnancy seen in the African continent where patients may present with haemoglobins (Hb) of less than 4.0 g% or hematocrits (PCV) of less than 13.0%. In such patients, maternal mortality directly related to the anaemia is high, being 20.0% in those without heart failure and 55.0% in those with associated heart failure (1). In the circumstance, conventional methods of treatment are ineffective and may even be dangerous especially during late pregnancy or in labour. To combat this disadvantage, Fullerton and Turner (1962) (1) and Philpott et al (1966) (5) have employed the technique of partial exchange transfusion with great success in such patients in Africa.

In this paper, we describe a case of severe anaemia in late pregnancy presenting with heart failure in whom partial exchange transfusion brought about a dramatic response.

CASE REPORT

A 29 year old gravida 5, para 4 was admitted on 5.11.1974 at 37 weeks gestation with severe anaemia and heart failure. She had marked conjunctival pallor, ankle and sacral oedema, sinus tachycardia of 120/min. a raised jugular venous pressure of 4 cm. (JVP), hepatomegaly of 2 cm., and bilateral basal crepitations in the lungs. She was dyspnoeic and orthopnoeic. There was no clinical evidence of any organic heart lesion. The uterine fundus was 38 weeks in size with the foetus in cephalic presentation.

The haemoglobin was 3.0 g% and the PCV was 10.0%. The mean corpuscular haemoglobin concentration (MCHC) was 30.0%.

Management consisted initially of intravenous lasix and rapid digitalisation. In view of the acuteness of the problem, it was decided to carry out *partial exchange transfusion*.

Procedure

About 200 ml. of blood was initially withdrawn from the left cubital vein. As 900 ml. of packed cells was transfused via the right cubital vein, 1200 ml. of blood was withdrawn from the left cubital vein of the patient into 3 blood bags. No vacuum pumps were necessary.

The patient's blood pressure and pulse were monitored every 15 minutes. The whole procedure took 2 hours. A final deficit of 500 ml. of blood was achieved.

Response

The following chart shows the response of the patient 4 hours and 24 hours following exchange transfusion:—

	Before Transfusion	4 hours after Transfusion	24 hours after Transfusion
Hb (g%)	3.0	5.5	—
PCV (%)	10.0	26.0	—
JVP	4 cm	2 cm	2 cm
Blood Pressure	140/90 mm Hg	140/85 mm.Hg	140/100 mm.Hg
Maternal Pulse	120/min.	104/min.	88/min.
Lung signs	Bilateral basal crepitations	crepitations left base	occasional crepitations left base
Symptomatology	Dyspnoea + orthopnoea	No symptoms	No symptoms

As can be seen, there was considerable improvement in the haemoglobin and PCV levels and marked resolution of cardio - respiratory signs. The patient was out of failure within a short duration.

Other investigations included a chest X-ray, blood urea, serum electrolytes and electrocardiogram, all of which were normal. Peripheral blood film showed moderate microcytosis with hypochromia, anisocytosis, poikilocytosis and mild macrocytosis. The diagnosis of iron - deficiency anaemia was made. Stools for ova and cysts showed presence of ascaris but absence of hookworm. Serum proteins included a low albumin of 2.9 g% and globulins of 3.6 g%.

On the 20.11.1974, at 39 weeks, she was induced by forewater amniotomy and oxytocin drip for toxæmia of pregnancy. She had a normal delivery of a live male baby of 2340 g. Blood loss at delivery was estimated at 150 ml. Syntometrine 1 ml. was given intramuscularly at crowning. She did not develop heart failure during labour.

She had a bilateral tubal ligation done on 25.11.1974 and was discharged well with her baby on 28.11.1974. Her post-partum haemoglobin was 9.5 g%.

DISCUSSION

According to Fullerton and Turner (1962) (1) and Philpott et al (1966) (5), the criteria for exchange transfusion in pregnancy are either a haemoglobin

of less than 4.4 g% or a PCV of less than 13.0%. Following the introduction of exchange transfusion in their patients, Fullerton and Turner noted a dramatic reduction in maternal mortality due to severe anaemia from 20.0% to 2.8% in patients without heart failure and from 55.0% to 3.6% in patients with heart failure.

The main advantage is that this method enables the haemoglobin level and red cell mass to be raised without at the same time augmenting the blood volume. Ordinary blood transfusion results in an increase in blood volume and might be lethal in patients with heart failure. If the patient is not in failure, this might be induced by the transfusion (1).

Moreover, Philpott et al (1966) (5) noted that the rise in haemoglobin and FCV levels could be achieved in 4 hours with partial exchange transfusion what would take 3 days with the conventional method. The mean increase in these values were also higher following partial exchange transfusion.

The above authors (1,5) transfuse between 1000 to 1500 ml. packed cells via the right cubital vein aided by a Martin's pump and withdraw between 1100 to 1700 ml blood from the left femoral vein aided by a vacuum pump. The whole procedure takes on an average 20 to 26 minutes. The blood withdrawn is packed and given back to the patient later. In our patient, we did not re-transfuse the blood withdrawn on the advice of the Blood Bank

unit that there was considerable haemolysis of the red cells.

We believe that this technique of partial exchange transfusion has a place to play in the treatment of severe anaemia in pregnancy especially in late pregnancy or in labour and more so in those patients with heart failure.

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