THE INCIDENCE AND TREATMENT OF SEVERE PREGNANCY ANAEMIA IN THE CAPE TOWN AREA*

J. DOMMISSE, M.B., CH.B., M.R.C.O.G. AND E. D. DU TOIT, M.B., CH.B., *Department of Obstetrics and Gynaecology and the Cape Provincial Blood Grouping Laboratory, Groote Schuur Hospital and the University of Cape Town*

Anaemia is so commonly encountered in the pregnant patients under the care of our hospital and municipal antenatal clinics that it was decided to undertake a survey to determine the incidence of anaemia in pregnancy, the type of anaemia encountered and a logical approach to its prevention and treatment.

The type of anaemia encountered in a particular geographical area will vary. This may depend on dietary or other factors, for example the presence of an endemic disease such as malaria.

Folic acid has been widely advocated as important in preventing anaemia and it was therefore necessary to determine the incidence of megaloblastic anaemia in this community before accepting this therapy.

The following is a brief and preliminary report of the results of this survey.

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METHOD

Haemoglobin estimations were performed by the laboratory on all patients booking for confinement at both hospital and municipal antenatal clinics. A total of 45,350 haemoglobin estimations were performed. The incidence of moderate anaemia (haemoglobin 8 - 9·9 G/100 ml.) was 10·1% and of severe anaemia (haemoglobin 4 - 7·9 G/100 ml.) 0·5%.

The 244 patients with severe anaemia were referred to a special clinic for complete investigation. If, on arrival at the clinic, the haemoglobin was confirmed to be less than 8 G/100 ml. and the patient had received no previous haematinic therapy, full investigations, including bone-marrow aspirations, were performed. Thus, 100 patients were fully investigated.

Table I gives details of these 100 patients.

TABLE I. DETAILED INVESTIGATION OF ANAEMIA IN PREGNANCY IN 100 PATIENTS

Total haemoglobin estimations performed			45,350
Total patients referred for detailed investigation (Hb. less than 8 G/100 ml.)			250 (0·5%)
Total complete investigations including bone-marrow examination			100
Race	Coloured	86	
	Bantu	8	
	White	6	
Parity	Primigravida	14	
	Gravida 2 - 4	33	
	Gravida 5 plus	53	
Age in years	< 20	13	
	20 - 30	48	
	> 30	39	

RESULTS

The aetiology of the 100 severe cases of anaemia is shown in Fig. 1.

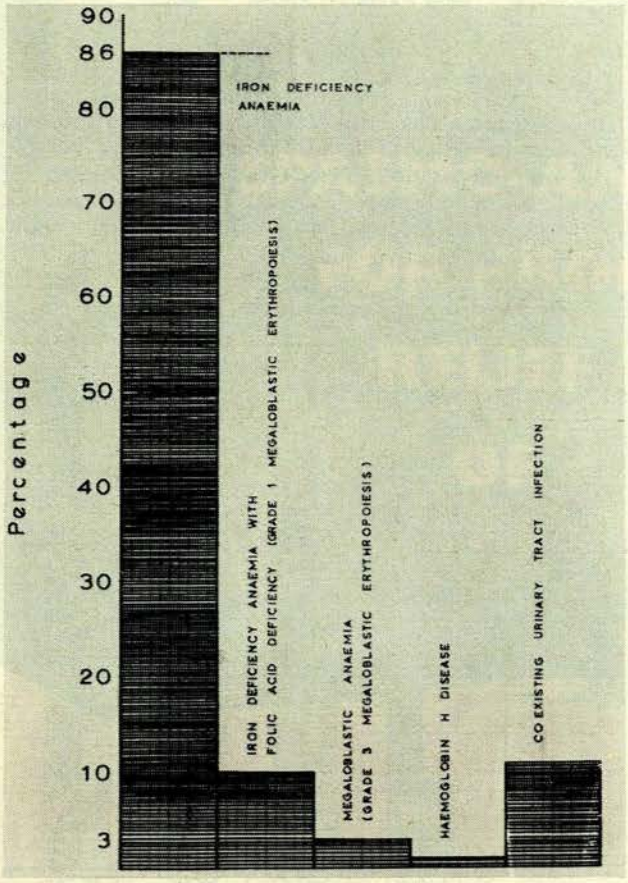

Fig. 1. Final diagnosis on bone marrow.

There was an overwhelming preponderance of iron-deficiency anaemia, accounting for 86% of the cases investigated.

Only 3 patients showed florid megaloblastic erythropoiesis and an additional 10 patients had mild megaloblastic erythropoiesis (grade 1) in the presence of iron-deficiency anaemia. One patient had haemoglobin-H disease. The over-all incidence of urinary tract infection on culture of mid-stream urine specimens was 10%.

Fig. 2 illustrates the means of the diagnostic criteria in patients who had iron-deficiency anaemia, and in all these cases there was a complete absence of stainable iron in the bone-marrow specimens.

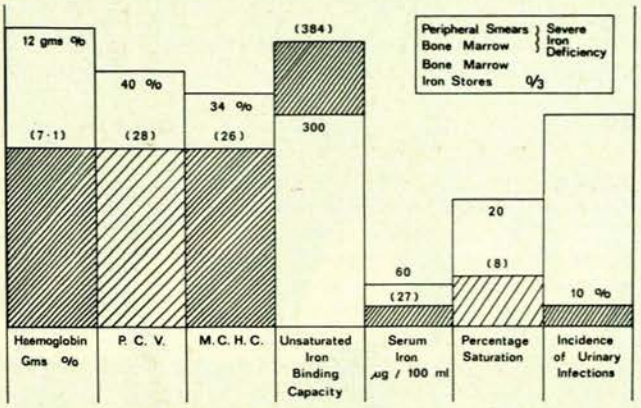

Fig. 2. Diagnostic criteria means in the 86 cases of iron-deficiency anaemia.

Fig. 3 depicts the values of the red cell folates and the folates in patients with grade 1 and grade 3 megaloblastic erythropoiesis. As can be seen, both levels were very low in the patients with florid megaloblastic ery-

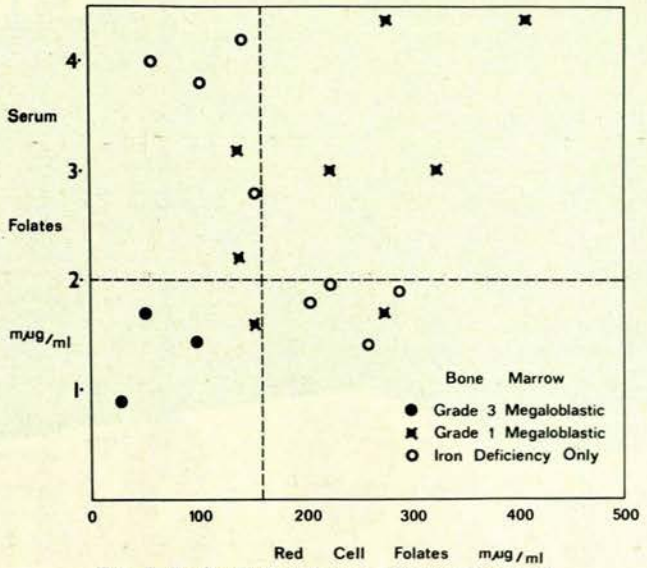

Fig. 3. Red cell and serum folates compared.

thropoiesis, but in about half the patients with early megaloblastic erythropoiesis these parameters were within normal limits. In addition, 8 patients with normoblastic erythropoiesis had either a low serum folate or a low red cell folate level, possibly indicating folic-acid deficiency.

One may conclude that 21 patients had some evidence of folic-acid deficiency but only 3 had megaloblastic anaemia. On the other hand, as detailed later, the evi-

dence of folic-acid deficiency in the other 18 patients was probably of no significance in relation to the anaemia, which was basically due to severe iron deficiency.

ASSESSMENT OF TREATMENT

Folic-Acid Deficiency

In an attempt to ascertain whether patients with evidence of folic-acid deficiency in addition to iron-deficiency anaemia required folic acid, it was decided to treat such patients with iron only. This was done while keeping a careful watch on their haematological progress, as the development of megaloblastic anaemia can be acute and result in rapid deterioration.

It was only possible to do this adequately in 4 patients, as the other patients required urgent transfusion for obstetrical reasons.

The remarkable response to iron therapy is illustrated in Fig. 4. The serum folates and red cell folates were repeated on 2 of these patients once the haemoglobin had been corrected, and in both cases were found to be still below normal. None of these patients developed anaemia later in pregnancy or in the puerperium.

A fifth patient treated with folic acid alone failed to respond and was transfused.

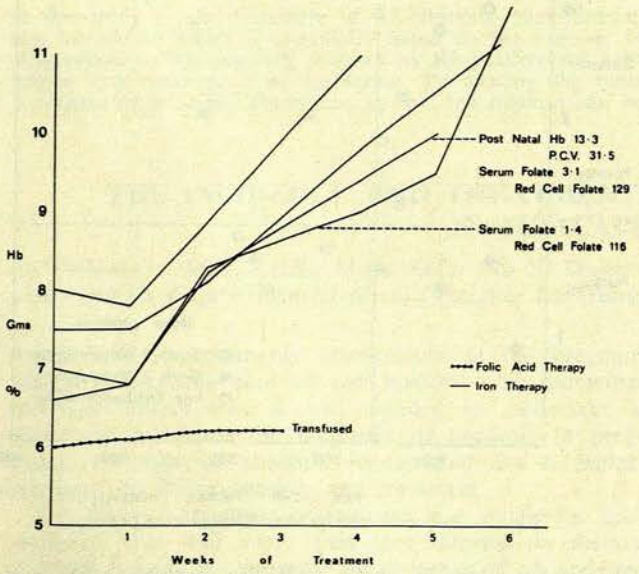

Fig. 4. Response to iron therapy.

Iron-Deficiency Anaemia

Iron-deficiency anaemia will respond in most cases to the oral administration of iron. In many cases, however, the response is unsatisfactory, due either to patients failing to take their tablets regularly or, occasionally, to poor intestinal absorption.

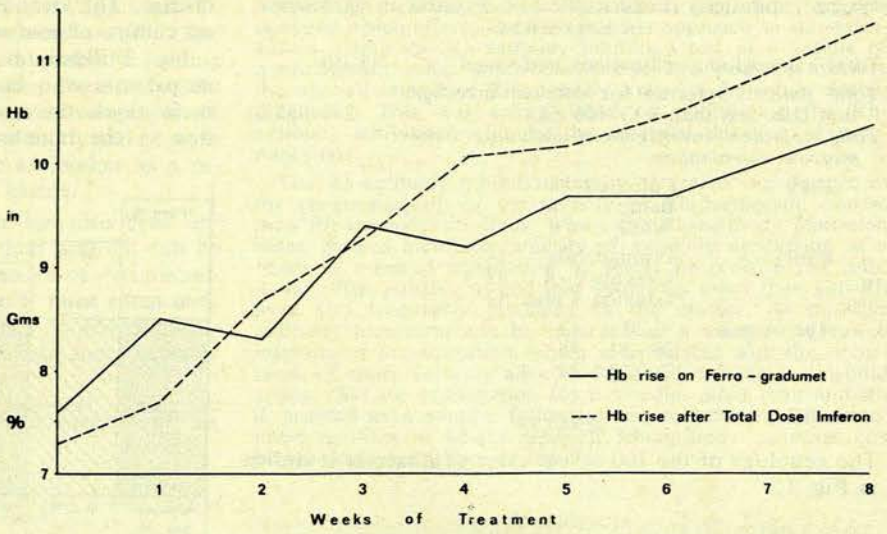

Fig. 5. Graphic comparison of response between Imferon (22 patients) and oral iron (38 patients).

It was thus decided to compare the response to oral iron with the response to total-dose intravenous Imferon.

An oral preparation, Ferro-Gradumet, containing 105 mg. of elemental iron as a single daily dose, was used. This was easy to control and previous studies[1] had shown it to be both effective and well tolerated.

Intravenous Imferon was administered on an outpatient basis at the recommended dosage (0·3 × wt. in lb.

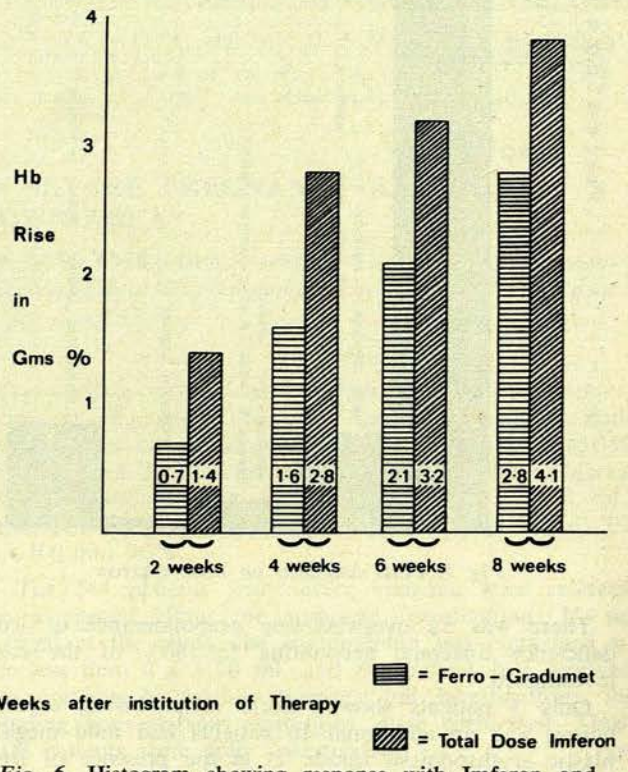

Fig. 6. Histogram showing response with Imferon and oral iron.

× haemoglobin deficit in % Haldane) diluted in normal saline. Phenergan, 50 mg., was given before administration. The concentration never exceeded 30 ml./1,000 ml. and was always started slowly. To date we have administered intravenous Imferon to 80 pregnant patients without major side-effects or need to discontinue the administration.

The results of this comparison are shown in Figs. 5 and 6 and it is evident that intravenous Imferon has produced a more rapid and complete response.

In addition, this method facilitates subsequent follow-up investigations, as the factor of patient or absorption failure is excluded. Probably the major advantage of total-dose intravenous Imferon is the rapid repletion of tissue and bone-marrow iron stores. To accomplish this by oral means, medication should be continued for 6 months.[2] This correction is most important, particularly with regard to the patient's future health and pregnancies.

DISCUSSION

The low incidence (3%) of megaloblastic anaemia in severe pregnancy anaemia (haemoglobin less than 8 G/100 ml.) is striking. Giles,[3] in an extensive investigation, found that in severe anaemia (haemoglobin less than 50%) 165 of 255 cases had megaloblastic anaemia. In the Transvaal, Edelstein *et al.*[4] studied 100 anaemic Bantu patients following delivery and found that 78% showed morphological evidence of deficiency of antimegaloblastic factors.

Megaloblastic anaemia is particularly prevalent near term and in the puerperium, and most of our cases were between 24 and 34 weeks pregnant. However, any patient who developed severe anaemia later in her pregnancy was also included in the series, so that this is probably not a very significant factor.

The most likely explanation is that as megaloblastic anaemia is basically due to a dietary deficiency of folic acid, associated with certain other precipitating factors, the diet of our patients, even in the lower socio-economic groups, is not lacking in folic acid. Fruit and vegetables containing folic acid are relatively cheaply available in the Cape Town area and form part of the basic diet of the group investigated, in contrast to the groups quoted above.

The response to iron therapy in patients with additional evidence of folic-acid deficiency confirms the statement by Dawson[5] that the presence of megaloblastic erythropoiesis in the marrow of a patient with iron-deficiency anaemia does not mean that the response to iron therapy will be suboptimal or that the patient's anaemia will improve on vitamin B_{12} or folic acid.

The reason for the better response to intravenous iron than to oral iron is probably partly due to patient failure, although every possible precaution was taken to avoid this. In certain cases there may have been inadequate intestinal absorption. In either case the more liberal use of intravenous Imferon is justified, and the early correction of tissue and bone-marrow iron stores is an additional advantage.

SUMMARY

A total of 45,350 haemoglobin estimations were performed on patients attending antenatal clinics in the Cape Town area. The incidence of severe anaemia (haemoglobin less than 8 G/100 ml.) was 0·5%. Detailed investigation, including bone-marrow aspiration, was performed on 100 such patients with severe anaemia.

By far the commonest cause of the anaemia was iron deficiency, and only 3 cases of megaloblastic anaemia were encountered. Certain patients with evidence of folic-acid deficiency responded to iron therapy alone. Total-dose intravenous Imferon was found to be safe and more effective than oral iron in the treatment of established iron-deficiency anaemia.

All pregnant patients should receive supplementary iron therapy during pregnancy, but folic acid is only indicated in this area in certain selected cases.

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