

Iron dextran in the treatment of iron-deficiency anaemia of pregnancy

Haematological response and incidence of side-effects

M. L. STEIN, K. D. GUNSTON, R. M. MAY

Summary

Sixty pregnant patients with a haemoglobin (Hb) < 8 g/dl and proven iron-deficiency anaemia were randomly allocated to two treatment groups. Group A received the usual recommended dose of iron dextran (Imferon; Fisons) and group B received two-thirds of the recommended dose. A further 30 patients received oral iron (group C). There was no difference in Hb value between the three groups 4 weeks after treatment or 3 months after delivery. At 6 months after delivery, a higher mean Hb value was found in the patients in group A than those in groups B and C. Significantly higher serum ferritin levels were found in group A and this difference was still present 6 months postnatally. There was no significant difference in the incidence of delayed reactions between the two groups who received iron dextran.

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A significant number of antenatal patients with a low haemoglobin (Hb) value book late in pregnancy. Most of them have iron deficiency anaemia.¹ Total dose infusion (TDI) with iron dextran is an accepted form of treatment in pregnant iron-deficient women who cannot be managed on oral iron therapy.² In order to reduce the need for blood transfusion before delivery, it is necessary to use a method of treatment in iron deficiency anaemia which will raise the Hb level rapidly. Many patients will not take oral iron reliably because of poor motivation or the presence of side-effects.

Of the various laboratory measurements to assess iron status, the serum ferritin value is the most sensitive and specific indicator of iron deficiency, a level below 12 µg/l being absolutely diagnostic.³ In normal pregnancy, however, studies have shown that the serum ferritin level decreases, reaching levels of 15 µg/l or less in the 3rd trimester. When administering iron therapy, the serum ferritin value remains a valid measurement of body iron stores and it is thus useful not only in identifying iron deficiency but in monitoring its repair.^{3,4} Imferon (Fisons), an iron dextran complex, has been available for almost 30 years as a parenteral treatment for iron-deficiency anaemia. Its administration is associated in some patients with a delayed reaction characterised by arthralgia, myalgia, malaise and pyrexia.^{5,6} It has been suggested that the incidence of delayed reactions is dose-related.⁷

A study was undertaken to ascertain whether the haematological response and the incidence of delayed reactions would

be significantly reduced using a lower dose of iron dextran and to assess whether parenteral iron dextran would raise the haemoglobin value more rapidly than the use of oral iron.

Patients and methods

Sixty patients with an Hb value of < 8 g/dl and proven iron-deficiency anaemia, who were either non-compliant or intolerant of oral iron, were randomly allocated to two treatment groups. Group A received the full calculated dosage of iron dextran including the additional 10 ml for pregnancy, while group B received two-thirds of the recommended dose. The final number of patients who received the full dose was 31, while 29 patients received the two-thirds dose. Group C consisted of 30 patients who received, and were able to take, oral iron.

Patients with a known hypersensitivity to iron dextran, a history of asthma, rheumatoid arthritis or confirmed urinary tract infection were excluded.

A research sister was appointed to administer and to observe the patients throughout the infusion. One week after TDI the research sister contacted the patients to enquire about the occurrence of a delayed reaction.

The Hb estimations were measured before infusion or start of oral iron, 4 weeks after treatment, and 3 and 6 months after delivery.

Serum ferritin estimations were carried out according to the method of Dempster *et al.*,⁸ before initiating the treatment, 8 weeks after treatment and 6 months after delivery. As the data were skewed, an analysis of variance was performed on log transformed data, with posthoc *t*-tests on those groups showing significant differences.

The delayed reactions to the TDI were graded as follows: grade 0 — no reaction; grade 1 — arthralgia and myalgia; and grade 2 — pain, malaise and pyrexia requiring admission to hospital.

Results

The Hb response is shown in Table I.

There was no statistically significant difference between the three treatment groups before treatment, 4 weeks after treatment and 3 months after delivery. At 6 months after delivery the patients in group A had a statistically significant higher mean Hb value than the patients in groups B and C. The results of the measurement of serum ferritin levels show that at 8 weeks after treatment and 6 months after delivery the mean serum ferritin values were significantly higher in group A than in either of the other two groups.

None of the 60 patients experienced an acute anaphylactoid reaction to the iron dextran.

The incidence of delayed reactions is also shown in Table I. Using the χ^2 test of independence of variables, it was found that the incidence of side-effects was not dependent on dose.

Anaemia Antenatal Clinic, Department of Obstetrics and Gynaecology, Somerset Hospital, Cape Town

M. L. STEIN, M.B. CH.B.

K. D. GUNSTON, M.B. CH.B., F.R.C.O.G.

Provincial Laboratory for Tissue Immunology, Cape Town

R. M. MAY, M.B. CH.B.

TABLE I. HAEMATOLOGICAL RESPONSE AND INCIDENCE OF SIDE-EFFECTS

	Haemoglobin			Ferritin			Side-effects		
	Group A	Group B	Group C	Group A	Group B	Group C	Grades	Group A	Group B
Before treatment	7,35	7,44	7,25	6,60	9,38	7,33	0	10	10
1 mo. after treatment	9,95	10,06	9,78	-	-	-	1	15	17
2 mo. after treatment	-	-	-	171,24(S) [†]	101,32	54,73	2	6	2
3 mo. after delivery	12,87	12,27	13,02	-	-	-			
6 mo. after delivery	13,49(S) [*]	12,40	12,82	137,59(S) ^{††}	51,76(S) [§]	27,47			

*t-test A v. B ($P < 0,005$)†t-test A v. C ($P < 0,01$)† t-test A v. B ($P = 0,0006$)†† t-test A v. B ($P = 0,0003$)§ t-test B v. C ($P = 0,014$)

Discussion

Intravenous administration of iron dextran is a safe and reliable method of correcting iron-deficiency anaemia in a patient who is precluded from oral iron therapy.⁹ In this study the dose of iron dextran was lowered in an attempt to reduce the occurrence of reactions, but still achieve a satisfactory improvement in the Hb and serum ferritin values.

However, in view of the fact that the incidence of delayed reactions was not significantly reduced by using the two-thirds dose, and that the ferritin levels were higher with the full dose, it is advisable that the full recommended dose of iron dextran be used. Parenteral iron dextran did not raise the Hb value more rapidly than oral iron in compliant patients.

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