

## OUR EXPERIENCE WITH NEAT TOTAL DOSE IRONDEXTRAN (IMFERON) IN 2000 CASES

by

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Nutritional anaemia is a major public health problem in India. Nutritional anaemias during pregnancy pose a special problem in management. The report from the study group of the Nutritional Society of India on Nutritional anaemia states that 50 per cent of the pregnant women have haemoglobin levels below 10.5 Grams per cent (ICMR, 1968). Iron deficiency is most common in nutritional anaemias. Folic acid deficiency is noticed in 40 per cent of the cases of nutritional anaemia in pregnancy. Twenty per cent of the maternal deaths in poor socioeconomic group are attributed to anaemia (Gopalan and Jaya Rai, 1972). There is no doubt that oral iron during pregnancy is the best for prophylaxis as well as therapy for iron deficiency anaemia. However, there are special situations during pregnancy when oral iron may not be possible.

1. There may be intolerance to oral iron.
2. Patient may not take oral iron regularly.

3. Diseases of gastrointestinal tract may either retard iron absorption or may contra-indicate use of oral iron.

Parenteral iron becomes necessary in such cases. We are using neat iron dextran intravenously at Shree Sayaji General Hospital, Baroda, since 1964. We have published our experience earlier (1966, 1968, 1970, 1971, 1972, 1973). Now we report our experience with 2000 cases in the obstetrical and gynaecological patients. Looking to the published reports on intravenous iron, this appears to be the largest series reported so far. The purpose of this article is to focus attention on problems associated with intravenous iron therapy.

### *Material and Methods*

The patients were taken from the obstetrical and gynaecological wards of the Shree Sayaji General Hospital. The criteria for selection of the cases have been emphasised in our previous articles (1966, 1972). The haemoglobin values ranged from 3 G. to 9 G. per cent. Patients were admitted in the earlier series mainly for bone marrow and serum iron studies and also for follow up the wards to record

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any complications. Now, we do not admit the patient but administer iron dextran intravenously on out-patient basis. Intravenous iron therapy was possible in 90 per cent of the patients on gynaecological side and 80 per cent of the patients on the obstetric side. The rest of the patients could not be given the TDI because either they did not satisfy the criteria or had a reaction with the test dose. Folic acid was given for 4 weeks (5 mg. daily) to every patient.

#### Technique

The patient was given a test dose of 100 mg. iron dextran intravenously in the earlier series. Now we give only 50 mg. test dose. The test dose is given in two minutes and without any premedication. If the test dose is tolerated, the total dose is given after 30-45 minutes. We used to give injection of an antihistaminic and a tranquiliser in the earlier series. Now we do not give any premedication except one tablet of chlorquin sulphate (equivalent to 150 mg. base) by mouth, just before administering the total dose and repeated after 6 hours. The dose is calculated by the formula  $0.3 \times \text{weight in pounds (100-Hb-percentage)}$ . The syringes are autoclaved and not boiled. Initially, we inject at the rate of 2 ml/minute which later increases to 5-6 ml./minute. Adequate facilities are available to combat severe reactions.

#### Analysis

There were 1600 obstetrical and 400 gynaecological cases. The initial haemoglobin was less than 7 G. per cent in 71 per cent of our cases (Table I). Serum proteins were estimated in 1200 cases and the values of total serum proteins were less than 5 G. in 26.6 per cent of the cases (Table II). Serum iron was estimated in

TABLE I  
*Initial Haemoglobin Status*

Haemoglobin	No. of Cases
Less than 5 G.	300
5.1 — 6 G.	450
6.1 — 7 G.	670
7.1 — 8 G.	410
8.1 — 9 G.	170
Total	2000

TABLE II  
*Serum Proteins*

Serum Protein	No. of Cases
Less than 5 G.	320
5.1 — 6 G.	710
6.1 — 7 G.	170
Total	1200

900 cases and showed lower values in all cases (Table III). We used to repeat the

TABLE III  
*Serum Iron*

Serum iron in Micrograms	No. of Cases
Less than 50	275
51 — 60	244
61 — 70	312
71 — 80	069
Total	900

haemoglobin after 48 hours and then every week for 4-6 weeks. Now we repeat the haemoglobin after 2 weeks and then after 4-6 weeks. Average haemoglobin rise works out as 1 G. per week in obstetrical cases and 1.5 G. per week in gynaecological cases. The haemoglobin rise was quick if the initial haemoglobin values were low. Haemoglobin values remained steady after reaching 10 G. and showed a rise only after delivery in most cases.

*Reactions*

We have been able to record a fall in local and systemic reactions over the years because of increasing experience, better patient selection and team work. Now we have local reactions in only one per cent of the cases and systemic reactions in 10 per cent of the cases. We have succeeded in reducing systemic reactions to 2.2 per cent if we restrict the dose upto 20 ml. Fever, bodyache, headache, giddiness, joint pains and chest pain are some of the systemic reactions. Aspirin was administered to these cases. The reaction rate reported by other workers is compared in Table IV. We feel that the reactions are related to the dose (Table V).

ber (Table VI). This needs confirmation

TABLE VI  
*Seasonality*

Months	Reaction Rate
June-October	15.6%
November-May	8.2%

from other workers. There is no mortality in the series.

It is said that oral iron should be continued for 3-6 months after the haemoglobin comes to normal. This is necessary to build adequate iron stores. If the oral iron is not taken for 3-6 months after haemoglobin has reached normal, the patient would develop anaemia earlier in the next pregnancy. We therefore

TABLE IV  
*Reactions to TDI*

Author	Year	No. of Cases	Reactions	
			Local	Systemic
Mehta, B. C.	1968	111	2%	24.3%
Basu, S. K.	1963	30	13.3	No mention
Marchasin	1964	37	2.7	2.7
Pereira, W. S. E.	1968	545	—	6.9
Byles	1970	—	0.8	1.28
Bhatt, R. V.	1976	2000	1	10

TABLE V  
*Reactions in Relation to Dose*

Dose	Reaction Rate
11 — 20 ml.	2.2%
21 — 30 ml.	12.6%
31 — 40 ml.	21%
40 + ml.	40%

Now we do not inject more than 20 ml. at a time. If higher dose is required, we repeat after 24 hours. We recommend 20 ml. as the safest dose that could be given at a time. We have also observed seasonal variations in reactions. The reactions are high during June to Octo-

followed 300 cases of TDI in the subsequent pregnancy. The haemoglobin values were repeated at the first antenatal visit. This was compared with haemoglobin values of 260 patients who were treated with oral iron in the previous pregnancy (Table VII). Haemoglobin values more than 10 G. per cent were found in 72 per cent of the cases in the TDI group as compared to only 18 per cent of the cases in the group treated with oral iron. This shows that total dose corrects anaemia and also restores the iron stores. The iron stores are not restored unless oral iron is continued for

TABLE VII  
Haemoglobin Values in Subsequent Pregnancy

Haemoglobin	TDI Series		Oral Iron Series	
	No. of Cases	Percentage	No. of Cases	Percentage
Less than 7 G.	Nil	Nil	21	8
7 — 10 G.	84	21%	192	74
10 + G.	216	72%	47	18
Total	300		260	

3-6 months. In practice very few women continue oral iron for the desired period and so they manifest low haemoglobin values in subsequent pregnancy.

Anaemic patient requiring termination of pregnancy (MTP) is another good indication for TDI. Anaemic patients tolerate blood loss poorly and are more likely to get infected. Therefore, there is urgency in improving the haemoglobin status in such cases. We agree that haemoglobin rise over a long period say 4-6 weeks is similar irrespective of the route of administration of iron. How-

weeks pregnancy may go beyond the legal limit for termination if only oral iron is given. Therefore we use TDI in anaemic patients wanting termination of pregnancy.

#### *Economics of intravenous iron therapy*

We have compared the cost of iron therapy when given by mouth, by intramuscular route and total dose intravenous route. We have based the calculations on the basis of a hypothetical case with 6 G. haemoglobin and iron deficiency anaemia (Table VIII). It shows

TABLE VIII  
Cost Accounting

Drug and Route	Dose	Cost	Cost of injection (Doctor's charges)	Total Cost
i.v. iron dextran	36 ml.	35 Rs.	10 x 1 = 10 Rs.	45 Rs.
i.m. iron dextran	36 ml.	34 Rs.	5 x 18 = 90 Rs.	124 Rs.
Oral Fersolate	1000 Tablets	36 Rs.	—	36 Rs.

ever, our experience is that, if haemoglobin rise over a short period of two weeks legal limit for termination if only oral iron scores over other routes of administration of iron. If an anaemic patient with 10 weeks gestation, comes for termination, it would take longer to raise the haemoglobin by oral iron and in the meantime she would enter into second trimester where morbidity due to termination would be more than in first trimester. Similarly, an anaemic patient with 18-20

that the cost of the drug is more or less the same. The cost of giving intramuscular injection raises the total cost of therapy. With total dose, it is onetime method and therefore does not require sustained motivation to take injection, whereas with oral therapy and intramuscular therapy sustained motivation is needed. We recommend total dose iron under following conditions.

1. Haemoglobin less than 7 G. in pregnancy.

2. Patient near full term.
3. Intolerance to oral iron in previous pregnancy or current pregnancy.
4. Lack of patient co-operation in taking oral iron.
5. Patient with g.i. tract disturbances.
6. Malabsorption syndrome.
7. Creation of iron stores.

We feel that total dose intravenous therapy with iron dextran has established its place. It is reasonably a safe, very effective and economical in the long run. It is excellent to establish normal iron stores.

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