STUDY OF UNDILUTED TOTAL DOSE OF IRON DEXTRAN COMPLEX IN ANAEMIA OF PREGNANCY AND GYNAECOLOGICAL CASES

by

CHANDRAVATI SAXENA,*
NAVARATAN BAFNA,**
and
SANTOSH GANDHI,***

In 1963, Basu in England described the technique of correcting iron deficiency anaemia by giving the calculated dose of Imferon after diluting with 5% dextrose instravenously.

Advantages of this method are: (1) It provides complete correction of iron deficiency. (2) It eliminates the need for repeated visits of the prospect of having 6 or more deep intramuscular injections. (3) The patient prefers to have their treatment in one day and therefore show the preference for this method. (4) The treatment of iron deficiency anaemia by this total dose method has reduced the damand for blood bank, specially who are posted for major surgery. (5) Iron dextran can be used as a substitute for blood as it is more readily available and free from risk of incompatibility.

Recently Mehta and Patel (1968) and Joseph *et al* (1971) used undiluted total dose iron dextran complex which offers the following advantages over the diluted technique:

(1) Time required for the administration of iron is reduced from several hours to less than 45 minutes.

(2) Dangers of circulatory overload with a large volume of infusion fluid in cases of congestive failure associated with severe anaemia is eliminated.

(3) Poor quality of infusion fluid, drip set and improper sterilization of sets are mentioned as causes of side reactions as local and systemic are minimised.
(4) Saving of infusion fluid is an additional benefit.

Material and Method

Sixty-five cases of iron deficiency anaemia were given total dose imferon by undiluted technique. Iron dextran complex was selected because of its extremely low toxicity, high stability and freedom from ionic iron and its established haematinic effect. The total dose of iron dextran complex required by the patient was determined from the manufacturer's tables which relate the quantity required to body weight and haemoglobin deficit with an allowance for replenishment of store iron. The test dose of imferon (2 c.c.) was given intravenously taking about 3 minutes to complete the injection, to exclude the sensitivity of the individual to the drug. Those who were not sensitive were given total dose imferon next day and if any reaction occurred during injection, was noted and treated. In a few cases of severe anaemia total dose re-

*Professor of Gynaecology & Obstetrics.
**Lecturer of Gynaecology & Obstetrics.
***Registrar, Department of Gynaecology & Obstetrics, S.M.S. Medical College and Zenana Hospital, Jaipur-4 (Rajasthan).

quired was given in fractions at an interval of 3 days. Each case was followed up for one month. Weekly estimation of haemoglobin in gm.% was done to see the maximum response. Any reaction early or late during this period was noted. During this period no oral or parentral iron was administered. Proteins, liver and folic acid were given to most of the cases.

Observations

Out of 65 cases subjected to total dose, 7.69% were sensitive to parentral iron as was observed with the test dose.

The reaction of these five cases were as follows:

Rigor and discomfort—1, urticaria—2, severe perspiration—3, pruritis—3, fever —1, pain in joints—1, difficulty in breathing—2, collapse—1.

Above complications were easily treated with antiallergic drugs. One patient of transitory collapse immediately after sensitivity dose felt difficulty in breathing, restlessness, numbness all over the body, B.P. fell from 110/70 mm of HG, to 90/60 mm of HG. Injection Avil intramuscularly was given immediately and later on followed by antistine tablets. Patient recovered in one hour.

Out of 60 cases under study the distribution of gynaecological and obstetric patients was as follows:

(A) *Gynaecological:*—	
—Fibroid uterus ..	2
—Functional uterine bleeding	11
—Inversion uterus ..	3
—Sarcoma cervix	1
—Cancer cervix	1
—Uterovaginal prolapse ..	2
—Leiomyo-sarcoma ..	1
—Vesico-vaginal fistula ..	1
TOTAL	23
(B) *Obstetric:*—	
—Pregnancy	17
—Postnatal cases	8
—Abortions	11
(C) *Medical:*—	
—Chronic dysentry ..	1
Total	37

Only 57 cases out of 60 could be followed upto four weeks.

The rise in haemoglobin of these groups in four weeks has been recorded in Table 1-A and 1-B.

TABLE I-A
Gynaecological Cases

S. No.	Disease	Initial Hb. Gm%	Total rise in Hb% in 4 weeks in gms%
1.	Functional uterine bleeding (11)	2-6 (4.845)	9•8 (5.9)
2.	Uterovaginal prolapse (2)	7	4
3.	Inversion uterus (3)	4-5	5-4.9
4.	Fibroid uterus	3-7	3-4
5.	Vesico-vaginal fistula (1)	8-4	3
6.	Adenocarcinoma (1)	7	3
7.	Cancer cervix (1)	4-5	3-7
8.	Sarcoma (1)	4-6	4-4

TABLE 1-B

Obstetric Cases

S. No.	Disease	Initial Hb. gms%	Total rise in Hb% in 4 weeks in gms%
1.	Abortion (11)	5-7.6	3.54
2.	Pregnancy (16)	3.2-6.5	4.998
3.	Postnatal cases	4-7.6	3.95
Medical Cases			
4.	Chronic dysentry (1)	6	3

Out of 23 gynaecological cases, 10 cases were made fit for undertaking major surgery after total dose of iron dextran. Ten cases of functional uterine bleeding were discharged with conservative line of treatment with good rise of haemoglobin.

TABLE II

Showing Rise of Haemoglobin in Severe Anaemia (Hb.—6 gms or less) Compared With That of Moderate Anaemia in Gynaecological Cases

	Severe Anaemia			Moderate Anaemia		
S. No.	Disease	Initial Hb in Gms%	Total rise of Hb in gms%	Disease	Initial Hb in gms%	Total rise of Hb in Gms%
1.	Functional uterine bleeding (11)	4.854	4.01	Adeno carcinoma	7	3
2.	Inversion uterus (3)	4.33	5.166	V.V.F.	8.4	1.6
3.	Sarcoma (1)	4.6	4.4	Fibroid Uterus	7	2.5
4.	Fibroid uterus (1) 3	3	5.5	U.V. Prolapse	7	3
5.	Cancer cervix	4.5	3.7			
6.	Leiomyo-sarcoma	5.5	3			
Total average rise		4.32	4.14	Total Average rise	7.35	2.52
Obstetric Cases:—						
1.	Postnatal cases	4.916	4.916	P.N.C.	6.73	2.43
2.	Pregnancy	4.91	5.33	Pregnancy	6.5	4.5
3.				Abortion	6.7	2.475
Total Average rise		4.91	5.123	Total Average rise	6.623	3.155

Forty-one out of 60 cases with severe anaemia who were given total dose of iron dextran, the average total rise in gynaecological cases was 4.14 gms%, in obstetric cases 5.123 gms%, while in 20 cases of moderate anaemia average total rise in gynaecological cases was 2.52 gms%, while in obstetric cases 3.135 gms% as shown in Table II.

In very severe anaemia (Hb. less than 4 gms%) total average Hb.% rise in the first week was 1.8 gms, while in fourth week total average rise of Hb.% was 5.72 as shown in Table III.

of functional uterine bleeding (Hb. 5.2 gms%) was given total dose in fractions, 16 ml and 16 ml at an interval of 4 days. She had rise of temperature varying from 99°F. to 100°F. and joint pains.

In one case of pregnancy with severe anaemia (Hb. 6 gms or less) rise was delayed, only 2 gms% rise was within 4 weeks and then rise was quick i.e. within a week it came up from 8 gms to 11 gms%.

One case of functional uterine bleeding with severe anaemia and pelvic abscess

TABLE III

Showing Haemoglobin Rise in Very Severe Anaemia (with Hb, less than 4 gms%) During First Week and 4th Week

S. No.	Disease	Initial Hb. in gms%	Rise of Hb% in gms% during first week	Rise of Hb.% in gms% during 4th week
1.	F.U.B.	Less than 2 gms	3 gms	8 gms
2.	Inversion uterus	4 gms	1 gms	5 gms
3.	Fibroid uterus	3 gms	6.4 gms	5.5 gms
4.	Acute inversion uterus	4 gms	1.2 gms	5.5 gms
5'	Functional uterine bleeding	2 gms	2 gms	4 gms
6.	A.N.C.	4 gms	1 gms	5.5 gms
7.	A.N.C.	3.2 gms	2.2 gms	6.3 gms
8.	P.N.C.	3.8 gms	1.2 gms	6.2 gms
9.	P.N.C.	4 gms	1.2 gms	5.5 gms
Total average rise			1.8 gms	5.72 gms

As blood was not available in two cases of functional uterine bleeding, who had mild reactions after test dose as headache, bodyache, were given total dose of iron dextran complex in fractions. One case of functional uterine bleeding with very severe anaemia (Hb. less than 4 gms%) was given total dose in fractions. First 32 ml and second 22 ml at an interval of 5 days without any reaction. Second case the rise of haemoglobin during the first week was 3.8 gms% but at 4th week she had a bout of bleeding and haemoglobin came down to 8.8 gms% from 11.0 gms%.

In one case of septic incomplete abortion, haemoglobin reduced from 5.6 gms to 4.2 gms% in the first week after total dose iron dextran. Sepsis might be responsible for reducing the utilization of iron dextran.

TABLE IV-A

Showing Reaction Noted During Total Dose of Iron Dextran

S. No.	Type of reaction	No. of cases
1.	Burning sensation	1
2.	Vomiting	1
3.	Fall of blood pressure (Transitory)	1
4.	Feeling of warmth	1
5.	Uneasiness	1

TABLE IV-B

Showing Reactions Noted Within 24 Hours of Total Dose Iron Dextran

S. No.	Type of reaction	No. of cases
1.	Fall of B.P. and vomiting after 20 minutes of total dose of imferon	2
2	Feeling of constriction of chest	1
3.	Pain in chest	2
4.	Rise of temperature	2

TABLE IV-C

Showing Reactions Developing After 24 Hours of Total Dose of Iron Dextran

S. No.	Reaction	No. of cases
1.	Fever	7 (12.3%)
2.	Joint pain	5 (8.7%)
3.	Oedema	2
4.	Headache	1
5.	Bodyache	3 (5.08%)
6.	Chest pain	1
7.	Palpitation	1
8.	Metallic taste	1
9'	Bradycardia	1
10.	Feeling of heaviness	1
11.	Rigor	2
12.	Nausea	1
13.	Giddiness	1

Discussion

Anaemia is a major problem in pregnancy as well as in gynaecological cases requiring surgery. Total dose of undiluted iron dextran complex solves these problems. Anaemia in pregnancy which is responsible for highest maternal morbidity and mortality can be treated without blood transfusion, gynaecological operations can be performed either without blood or at the most with one unit of blood in severe anaemia cases with haemoglobin 6 gm or less than 6 gms%. Blood transfusion has got its own hazards, specially in pregnancy and also there is great difficulty in obtaining blood from blood bank.

In the present study, 92.3% of the cases tolerated well the undiluted total dose of Imferon. Only 57 cases (95%) could be followed up to 4 weeks. Three cases with haemoglobin ranging from 6 to 6.4 gms% went away from the hospital within 12 to 24 hours after total dose of iron dextran complex. They never turned up for any complaint. So it was presumed that they might not have had felt any reaction and tolerated the total dose well.

Only 10.6% of cases were sensitive to test dose of parentral iron. The incidence of sensitivity is higher than 2.70% reported by Mehta *et al,* (1968) but it is nearly same (9.09%) as reported by Joseph *et al,* (1971). Two cases who were sensitive to test dose as noted by headache, bodyache were given, with all precautions, total dose in fractions as their anaemia was of severe degree and blood could not be arranged. They tolerated iron dextran in fractional doses, as the rest of the series. Five cases who were sensitive to test dose were not taken for study. One patient who was not sensitive to test dose, got transitory collapse and fall of blood pressure while completing

the total dose of iron dextrain complex, which was treated successfully.

Though all aseptic conditions were maintained while giving parentral iron dextran, the incidence of rise of temperature was present in 16% of cases, while Joseph *et al*, (1971) have quoted the incidence as 77%. Our incidence is nearly equal to Mehta *et al*, (1968), (12.03%).

Joint pain was present in 8.7% of cases, while Joseph *et al*, (1971) reported it in 68% of cases. Mehta *et al*, (1968) reported it in 10.1% of cases which is nearer to the present study. The exact cause of pain is unknown though it may be due to deposition of iron in joint capsule from where slow absorption and utilization of iron for haemoglobin formation takes place. No case in the present series developed thrombophlebitis as also reported by Joseph *et al*, (1971), while Basu *et al*, (1963-65) and Mehta *et al*, (1968) reported it as a common reaction.

Summary and Conclusion

Total dose therapy, in iron deficiency anaemia, with iron dextran complex is a well established technique for managing both obstetric and gynaecological problems.

Sixty-five patients were given test dose out of whom 5 were sensitive to test dose.

Two of the sensitive patients were given total dose in fractions without any major reaction.

The rise of haemoglobin in the first week after total dose of iron dextran complex was 2 gm.% in 35% of the cases, while according to Mehta *et al*, (1968) it was present in 45.2% of cases.

The total average rise of haemoglobin was more in obstetric than in gynaecological cases, more so in severe anaemia as compared to moderate anaemia.

Rise of haemoglobin was maximum in the first and the fourth week. More severe the anaemia, higher and quicker response in rise of haemoglobin was observed.

There was no case of thrombophlebitis in the present study. Minor reactions as fever, joint pain were present in 16% and 8.7%, respectively. Only one case collapsed while completing the total dose which was treated successfully.

References

1. Basu, S. K.: Lancet. **1**: 1430, 1963.
2. Joseph, B. and Chandra Kiran: J. Obst. & Gynec of India. **21**: 310, 1971.
3. Mehta, B. S. and Patel, J. C.: Ind. J. Med. Scie. **22**: 20, 1968.