

# ORAL VERSUS PARENTERAL IRON THERAPY FOR CORRECTION OF IRON DEFICIENCY ANAEMIA IN PREGNANCY

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## ABSTRACT

**Background:** Iron deficiency anaemia is a common problem in antenatal patients throughout the developing world. This study was conducted to evaluate the efficacy of oral versus parenteral iron therapy for correction of anaemia in pregnant women.

**Methodology:** This was a comparative study conducted in antenatal clinic of Saidu Teaching Hospital Swat. All pregnant women were tested for haemoglobin concentration and among them 100 patients with anaemia were consecutively selected. Selection criteria were haemoglobin level less than 11gm/dl and heamatocrit less than 33%. Selected patients were divided in two equal group, Group-I for oral and Group-II for intravenous administration of iron. The results of treatment were assessed on day 30 of the treatment.

**Results:** Rise in haemoglobin concentration was observed from  $9.35 \pm 1.62$  to  $11.20 \pm 0.28$  gm/dl in oral group and from  $9.20 \pm 1.69$  to  $12.65 \pm 1.06$  gm/dl in intravenous group on day 30.

**Conclusion:** Parenteral iron therapy in form of iron sucrose is better choice to correct iron deficiency anaemia related to pregnancy.

**KEY WORDS:** Pregnancy, Anaemia, Iron deficiency, Oral iron, Parenteral iron.

## INTRODUCTION

Iron deficiency is a common problem in antenatal patients throughout the developing world. Anaemia affects nearly half of all the pregnant women in the world, these figures are 52% in the developing and 23% in the developed world.<sup>1</sup> The high prevalence of iron deficiency anaemia among women during pregnancy in developing countries is of concern and a cause of considerable morbidity and mortality.<sup>2</sup> Anaemia is defined by World Health Organisation as a state where haemoglobin (Hb) is less than 11 gm/dl and haematocrit less than 33%.

The most common cause of anaemia is iron and folate deficiency. Iron deficiency anaemia accounts for 75-95% cases of anaemia in pregnancy. It can occur as a result of poor nutrition, malaria, hook worm infestation and closely spaced pregnancies. Anaemia results in an increased number of preterm, low birth weight, impaired cognitive development of children, postpartum haemorrhage, postpartum depression and reduced adult work productivity.<sup>3</sup>

In normal pregnancy there is 18% increase in red blood cells and 40-45% increase in plasma

volume. Because of this disproportionate increase in plasma volume, there is physiological haemodilution.

Oral iron supplementation is usually enough for most of the antenatal women. But intolerance to iron, abnormalities in absorption and non-compliance may make oral iron therapy in some women inadequate and these can be benefited from parenteral iron therapy. Iron sucrose is a suitable alternative source of iron; It can be administered by intra venous infusion. It is well tolerated and safe but may cause hypotension, nausea and low back pain.<sup>4,5</sup>

Iron deficiency anaemia in pregnancy needs acute corrective measures because of its related considerable morbidity and mortality.<sup>2</sup>

The objective of this study was to evaluate the efficacy of oral versus parenteral iron therapy for correction of anaemia in pregnant women.

## MATERIAL AND METHODS

This was a comparative study conducted in Department of Obstetrics and Gynaecology, Saidu

Teaching Hospital Swat, after approval from the hospital ethical committee.

Hundred consecutive pregnant women with anaemia attending the antenatal clinic at Saidu Teaching Hospital Swat were included in the study. The inclusion criteria were Hb concentration less than 11 gm/dl and gestational age between 26 to 30 weeks. Exclusion criteria were anaemia due to any other disease and history of intravenous iron therapy.

The patients were divided in to two groups (Group-I and Group-II) of 50 each by randomization.

Group-I was given 240 mg elemental iron as ferrous sulphate for 4 weeks. They were given a simple calendar to tick mark whenever they took their daily dose to maintain compliance.

Group II was given parenteral iron. The total iron dose was calculated by formula, rounded to nearest multiple of 100.

Total Iron Dose = Weight (kg) x [Target Hb (gm/l) – Actual Hb (gm/dl)] x 0.24 + 500mg<sup>6</sup>

The target Hb was taken as 12 gm/dl because of physiological haemodilution during pregnancy.<sup>6</sup> Actual Hb was Hb at the time of inclusion, 0.24 was correction factor and 500 mg is average stored iron in adults.<sup>6</sup>

The total dose for each patient was calculated and given in 2 divided doses on day 0 and 15. Each ampoule of iron sucrose contains 100 mg iron. It was given in 100 ml normal saline over a period of 30 to 40 minutes. Initial few drops were given very slowly and the patient was kept under observation for any adverse reaction. No oral iron was given to Group II patients during the study period.

The patients were asked to come on day 15 to inquire about any side effects and at day 30 for Hb levels.

## RESULTS

The age range of patients was 15–30 years with a mean of 24 years. The haemoglobin concentration of both the groups before and after therapy at day 30 is given in Table 1.

A clear Hb rise was observed in both the groups, i.e. an average increase of  $1.85 \pm 0.28$  in Group I and  $3.45 \pm 1.06$  in Group II. With the help of statistics software Graphicpad® (online), p value was calculated to be 0.0001 (highly significant).

In Group I, 23 (46%) patients experienced mild constipation. While in Group II nausea was experienced in 17 (34%) patients and unpleasant

**Table 1: Haemoglobin concentration pre and post iron therapy by oral and intravenous routes.**

	Range of Haemoglobin (gm/dl)	Mean+SD
<b>Before therapy</b>		
Group-I	8.2–10.5	9.35+1.62
Group-II	8.0–10.4	9.20+1.69
<b>After therapy</b>		
Group-I	11.0–11.40	11.20+0.28
Group-II	11.9–13.40	12.65+1.06

taste in 9 (18%) patients.

## DISCUSSION

In our study we gave iron sucrose at 15 days interval and found highly significant rise in haemoglobin concentration as also reported by Françoise B et al<sup>6</sup> who gave iron at weekly interval. While Al-Memon et al<sup>7</sup> reported no significant difference in the effectiveness of iron sucrose over oral iron for elevating Hb concentration during pregnancy.

Contrary to the conclusion of Reveiz et al<sup>9</sup> regarding parenteral iron therapy about possible serious adverse effects, in our study compliance with iv iron therapy was good.

In daily practice physicians often face poor compliance with oral therapy because of digestive side effects which can lead to worsening of anaemia. In these cases parenteral forms of administration are indicated as well as in those patients in whom oral treatment is ineffective,<sup>10</sup> like in those suffering from inflammatory bowel disease many of whom are iron deficient and show digestive intolerance to ferrous salt.<sup>11</sup>

Intravenous iron therapy was found safe, convenient and more effective than intramuscular iron therapy in treatment of iron deficiency anaemia during pregnancy by Wali et al.<sup>12</sup>

The effects of parenteral iron therapy on the baby should be investigated in further studies.

## CONCLUSION

Parenteral iron therapy in the form of iron sucrose proved better choice to correct iron deficiency anaemia as compared to oral therapy. If given in time, this will help to reduce the risk of blood transfusion during the peripartum period.

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