

**Iron sucrose vs Ferric carboxy maltose: searching a better option for the management of postpartum anemia**

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**Abstract**

**Aim:** To compare the safety and efficacy of iron sucrose and ferric carboxymaltose in the treatment of iron deficiency anemia in postpartum women.

**Materials & methods:** A total of 110 postpartum women (delivery within 10 days) were selected for the study. They were divided into two groups: 1) Iron sucrose group (200 mg/day in 100 ml 0.9% normal saline over 30minutes on 0, 2, 4, 6 and day). 2) Ferric carboxy maltose (FCM) group (1000 mg in 100 ml 0.9 % normal saline over 30 minutes). Follow up was done after 6 weeks on OPD basis to check for rise in hemoglobin.

**Results:** Both groups were comparable to age and parity. Most common age group was 23-27 years. In the iron sucrose group the mean hemoglobin rise was  $3.79 \pm 1.02$  whereas in the FCM group mean hemoglobin rise was  $4.9 \pm 1.16$ . Thus mean hemoglobin rise was more in FCM group. Adverse reactions were more common in iron sucrose (10.64%) as compared to FCM(4%) group.

**Conclusion:** Ferric carboxy maltose results in better rise in hemoglobin level and has less adverse reactions as compared to iron sucrose. Also FCM is given as a single dose whereas multiple doses are required in iron sucrose.

**Keywords:** Carboxymaltose, Hemoglobin

**Introduction**

Iron deficiency anemia is the commonest anemia in women of child bearing age and is a major cause of mortality and morbidity during pregnancy and puerperium. Iron deficiency anemia is present in about 65% of women<sup>1</sup>. Postpartum anemia leads to depression, stress, anxiety, lactation failure, sepsis, longer hospital stay<sup>2</sup>. Prompt treatment of anemia will result in improved quality of life<sup>3</sup>. Iron can be supplemented orally or parenterally. Oral iron has poor compliance, GI intolerance and unpredictable absorption rate<sup>4,5</sup>. There are various formulations for parenteral iron therapy like Iron dextran, iron sorbitol, iron sucrose and ferric carboxymaltose. Iron dextran

and iron sorbitol are given intramuscularly and are obsolete nowadays because of better intravenous iron preparations like iron sucrose and iron carboxymaltose. They can quickly bind to transferrin and travel to bone marrow resulting early rise in Haemoglobin in comparison to oral and intramuscular iron preparations. They have fewer chances of hypersensitivity reactions and can be given safely in postpartum period<sup>6</sup>. This study was done to compare the safety and efficacy of iron sucrose and iron carboxymaltose.

**Materials & Method**

This is a prospective observational study. Study was conducted at Rajendra Institute of Medical Sciences, Ranchi from May 2016 to April 2017. A total of 110 postpartum women (within 10 days of delivery) were included in the study. Patients who delivered at our institution with iron deficiency anemia (Hemoglobin between 7-9 gm%) were included in the study.

The study groups of 110 women were divided into two groups: 1) Iron sucrose group (200 mg/day in 100 ml 0.9% normal saline over 30minutes on 0, 2, 4, 6 and day). 2) Ferric carboxy maltose (FCM) group (1000 mg in 100 ml 0.9 % normal saline over 30 minutes).

Follow up was done after 6 weeks when CBC was done to check for rise in haemoglobin.

Any side effects (pain at injection site, itching and rash, abdominal pain, palpitation, headache, nausea, vomiting, anaphylactic shock) and compliance were be noted.

Informed and written consent was taken from all the patients enrolled in the study.

Calculation of iron requirement:  $2.4 \times \text{body weight (target Hb – actual Hb) + 500 mg}$

**Inclusion criteria**

- a) Age between 18-40 years.
- b) postpartum (within 10 days of delivery)

- c) Iron deficiency anemia (Hb:7-9 gm/dl);

**Exclusion criteria**

- a) Patients having hemoglobinopathies like thalassemia or sickle cell disease; or non iron deficiency anemia.
- b) history of bleeding disorders;
- c) blood transfusion or erythropoietin within 3 months;
- d) postpartum hemorrhage;
- e) History of asthma or cardio vascular disease.
- f) History of previous reactions with parenteral iron.

**Results**

Out of 110 women included in the study, 47 women received iron sucrose and 50 women received Ferric carboxymaltose. 8 patients from iron sucrose and 5 patients from FCM group didn't complete the study.

Both groups were comparable to age and parity. 70% women were multipara in both the groups (Table 1). Most common age group was 23-27 years (Table 2). In the iron sucrose group the mean hemoglobin rise was  $3.79 \pm 1.02$  whereas in the FCM group mean hemoglobin rise was  $4.9 \pm 1.16$  (Table 3). Thus mean hemoglobin rise was more in FCM group. Adverse reactions like itching, rash, pain at injection site, nausea, vomiting, pain abdomen, chills, rigor, fever and anaphylactic reactions were more common in iron sucrose (10.64%) as compared to FCM(4%) group (Table 4).

Table 1: Parity distribution of patients in both groups.

Parity	Iron sucrose group		Ferric Maltose group	
	n	%	n	%
Multipara	33	70	35	70
Primipara	14	29.7	15	30
Total	47	100	50	100

Table 2: Age distribution of patients in both groups

Age group	Iron Sucrose group		Ferric carboxy maltose group	
	n	%	n	%
18-22	9	19.1	11	22
23-27	33	70.3	35	70
>27	5	10.6	4	8
Total	47	100	50	100

Table 3: Pretreatment and post treatment haemoglobin levels in both groups

	Iron sucrose group	Ferric carboxy maltose group
	Mean ±SD	Mean ±SD
Pretreatment haemoglobin	7.29±0.66	7.90±0.48
Posttreatment haemoglobin	11.08±1.16	12.80±1.06
Haemoglobin difference	3.79±1.02	4.9±1.16

Table 4: Comparison of adverse effects between the two groups

	Iron sucrose group		Ferric carboxy maltose group	
	n	%	n	%
Adverse reaction	5	10.64	2	4
No adverse reaction	42	89.36	48	96
Total	47	100	50	100

**Discussion**

Postpartum anemia is a significant cause of morbidity. Earlier the treatment mode was either oral iron for mild anemia or blood transfusion for moderate to severe anemia. Parenteral iron therapy has avoided blood transfusion in majority of cases.

In this study we found that postpartum anemia is more common in multiparous women (70%), which is similar to study done by Joshi et al<sup>7</sup> who found the incidence of iron deficiency anemia to be 70-75% in multiparous women.

Lunagariya et al<sup>8</sup> in their study “Iron Sucrose versus ferric carboxymaltose: in search of better treatment option in cases of post partum iron deficiency anemia” found that most age group was 20-25 years whereas in this study most common age group was 23-27 years.

We found that the mean hemoglobin rise was 3.79±1.02 in iron sucrose group whereas in the FCM group mean hemoglobin rise was 4.9±1.16. Similar results have been observed in studies done by Verma U et al<sup>9</sup> and Patel RM et al<sup>10</sup>(4.6 in FCM group versus 3.5 in iron sucrose group).

Overall adverse reactions were more common in iron sucrose group which was similar to done by Patel RM et al<sup>10</sup>

**Conclusion**

Ferric carboxy maltose is safe and effective and results in more rises in haemoglobin than iron sucrose. It has shorter hospital stay.

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