COMPARATIVE EVALUATION OF DIFFERENT IRON PREPARATIONS USED IN PREGNANCY

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ABSTRACT:
Efficacy of different iron preparations used during pregnancy to correct anaemia was done by determining haemoglobin gram percentage. A survey of 123 pregnant women was carried out. It was concluded from the study that the capsules Sangobion showed (14/26) 53.85% improvement, Feofol vitamin showed (14/22) 63.64%, Folic acid + ferrous sulphate showed (5/7) 71.42% Iberet folic acid (1/3) 33.33%, Jectofer injection (38/51) 74.50%, Sangobion + jectofer injection (5/6) 83.33% improvement.

INTRODUCTION
Anaemia is a state in which the level of haemoglobin is below than that which is expected. Anaemia is said to be present in adults if the hematocrite is less than 41% in males and 37% in females. The anaemia is aggravated by the loss of iron due to menstruation or repeated pregnancies.

Many published figures give a haemoglobin level of 11g/100ml (175%) as being the lower limit of normal during pregnancy. Yet it has been shown that if additional iron is given to pregnant women the haemoglobin concentration does not fall to the same extent, and many authorities now regard any concentration below 12.6g/100ml (85%) as abnormal (Lan-Donald, 1981-82).

An excellent case can therefore be made out for the routine administration of additional iron during pregnancy especially after the first trimester when any morning sickness has passed.

The commonest source of trouble in anaemic pregnancy is inadequate absorption of iron. The daily normal requirement for the gravid woman is about 20 mg of iron, even in cases in which the iron stores have not suffered depletion prior to pregnancy. The baby, especially in the later months of pregnancy, makes heavy demands upon maternal iron and the average. Fetal requirements amount to about 375mg. Unfortunately, the margin between the patients requirements and the quantity of iron normally available in a reasonably good diet is a very narrow one. In fact, the average diet seldom contains more than about 15 mg a day. Of the total amount of iron in food, only a fraction (about 10%) is available for absorption. Natural foods, such as liver, meat, peas, eggs, and certain dried fruits, for example apricots, are good source of iron.

MATERIAL AND METHOD
A survey of 123 pregnant women was carried out to evaluate the different iron preparation used during pregnancy to correct anaemia by determining haemoglobin percentage by cyanmethaemoglobin method as recommended by International Committee for Standardization in Hematology (ICSH).

Reagents
Kits of test combination of haemoglobin
(Boehringer Mennhain GmbH Diagnostics) containing:
(i) Potassium hexacyanoferrate
(ii) Potassium cyanide solution

**Preparation of Test Combination:**
Dissolve contents of one bottle (Kit) 1 and one bottle (Kit) 2 in redistilled water and make up to 1000 ml in a graduated cylinder.

This solution was stored in amber coloured bottles. It should be tested at regular intervals to ensure that the pH is within the acceptable range and also ensure that it is free from turbidity.

**Principle:**
The potassium ferrocyanide converts the haemoglobin to methaemoglobin which is further converted to cyanmethemoglobin by the action of potassium cyanide (Hameed & Khan, 1984). Standard kits, EDTA (ethylenediamine tetracetic acid), Blood samples, Distilled water.

**Apparatus:**
Photometer 4010 (Boehringer), Sterilized disposable syringes, Test tubes (12 x 75 mm, 13 x 100 mm), Gloves, Sterile cotton, Tissue paper, Safety pipettes, Micropipettes (Shahlis pipettes, capillary pipettes 20 ul).

**RESULT AND DISCUSSION**
A study of 123 pregnant women from Sindh Government Hospital, Karimabad, Sindh Government Hospital, New Karachi, Abbasi Shaheed Hospital, Nazimabad and Private Clinic Patients, North Karachi was carried out to evaluate the different iron preparations used during pregnancy to correct anaemia. All pregnant women were interviewed and relevant information regarding age, sex, weight, height para, week of pregnancy, blood pressure, residence, family history, blood group were properly recorded on a proforma.

From gynecologist point of view it is desirable that women visit the doctor between 8–12 week of gestation. However present study show that the maximum numbers of women reporting to the doctor were between 20–25 week of pregnancy and the minimum number of women visiting doctor in between 31–36 week. None of 123 women actually reported at the desired time of reporting.

This reflect the importance which is given to the health of the mother and a child in our society. In these particular cases this can be attributed to the socio-economic status of these women.

**Sangobion (Haematinic):**
It is now a drug of choice as haematinic. During the study 26 out of 115 pregnant women were given sangobion as iron supplement for the treatment of anaemia. Fourteen of these pregnant women showed improvement in HbG% i.e. the improvement percentage was 53.85%. The drug was given for an average period of 7.2 weeks. The minimum improvement observed was 0.2 G% while the maximum improvement was 3.7 G%.

**Fefol Vit (Spansule Capsule):**
Fefol Vit is a haematinic with added vitamins used for prophylaxis of iron and folic acid deficiency during pregnancy.

A total of 22 women received one fefol vit capsule daily for 51 days. Fourteen women (63.6%) showed improvement in their haemoglobin. The minimum improvement being 0.2 G% and the maximum 2.8 G%.

**Folic Acid + Ferrous Sulphate:**
This combination was given to 7 out of 115 pregnant women. Five of these showed improvement in haemoglobin. The minimum improvement observed was 0.2 G% and the maximum was 2 G%.

Pritchard (1966) showed an increase of about 1.9g/100 ml Hb per week in patients receiving 180–220 mg iron (as sulphate, fumarate and gluconate) per day.

Israels and Cook (1965) have reported on
the efficacy of different salts of iron in oral preparations. Ferrous sulphate given in a dose of 240 mg elemental iron per day resulted in an increase of 2.2 g/100 ml haemoglobin after 4 weeks and 3.8 g/100 ml after 10 weeks.

With ferrous succinate given in a dose of 111 mg elemental iron per day resulted in an increase of 4 g/100 ml haemoglobin after 4 weeks and 6.1 g/100 ml after 10 weeks.

**Sangobion and Injection Jectofer:**
The aim of therapy during pregnancy is to correct severe iron deficiency anaemia. For this purpose physicians used combined therapy (oral + parenteral iron). 6 women were given sangobion capsule and jectofer injection. 5/6 patients showed improvement whereas the average therapy period was 49 days. The minimum improvement was 0.8 g/100 ml and maximum was 2.6 g/100 ml.

**Jectofer Injection:**
It is one of the most effective parenteral therapy for anaemia during pregnancy. The recommended single dose of jectofer is 1.5 mg per kg body ~ weight by I.M. injection to a maximum of 100 mg per injection. A series of daily injection of this single dose should be given to restore haemoglobin levels to normal

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**Table**

<table>
<thead>
<tr>
<th>Treatment</th>
<th>No. of Patients showing improvement</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sangobion</td>
<td>14/20</td>
<td>53.85%</td>
</tr>
<tr>
<td>Fefol Vit</td>
<td>14/22</td>
<td>63.64%</td>
</tr>
<tr>
<td>Folid acid + Ferrous sulphate</td>
<td>5/7</td>
<td>71.42%</td>
</tr>
<tr>
<td>Iberet folic</td>
<td>1/3</td>
<td>33.33%</td>
</tr>
<tr>
<td>Jectofer injection</td>
<td>38/51</td>
<td>74.55%</td>
</tr>
<tr>
<td>Sangobion + Jectofer injection</td>
<td>5/6</td>
<td>83.33%</td>
</tr>
</tbody>
</table>

No. of women prescribed different preparations = 115

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![Fig. Efficacy of different iron preparations](image-url)

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and replenish iron stores. In elderly or debilitated patients who have a low tolerance threshold to I. M. Iron, the injection should be given on alternate days.

Fifty one women received jectofer injection (I.M.) in a dose of 75 mg per day for an average of 50 days. Thirty eight (74.5%) showed improvement in their haemoglobin percentage. The minimum improvement in haemoglobin was 0.2g/100 ml and the maximum 3.0g/100 ml after about 7 weeks.

Nils (1961) investigated the efficacy of jectofer in 65 patients with iron deficiency. An increase of 2.3g/100 ml haemoglobin was found after five weeks of treatment. In another group with initial haemoglobin level of more than 12.1 g/100 ml the increase in haemoglobin was 1.7g/100 ml after five weeks of treatment.

Scott (1956) studied the effect of intramuscular iron therapy in anaemia of pregnancy in 200 women. An average dose of 500–600 mg iron (as iron dextran) per week was administered in 5 ml intramuscular injections on alternate days. Seventy of these patients showed an increase of about 0.2 g/100ml after 5 weeks.

Scott (1963) studying the effect of jectofer injection (iron sorbitol – citric acid) in pregnancy anaemia reported an increase of 0.44g/100 ml haemoglobin after 3 weeks of treatment with a weekly dose of 300 mg iron. As can be seen from the studies cited above, the results of the present study are similar to earlier studies.

All the patients in the study were outpatients and rate of compliance was determined only on patients statement. Keeping in mind the increased requirement of iron during pregnancy the improvement shown by the patients is quite significant. It is concluded that oral preparations of iron are as good for improvement of anaemia in pregnancy as are the parenteral preparations. This has been documented earlier as well by Pritchard (1966). It is suggested that parenteral preparations should be tried only in those cases where absorption of oral iron is not proper or patient cannot tolerate oral iron salts.

REFERENCES