



CODEN [USA]: IAJPB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF PHARMACEUTICAL SCIENCES

<http://doi.org/10.5281/zenodo.1419574>

Available online at: <http://www.iajps.com>

Research Article

STUDY TO DETERMINE THE SAFETY AND EFFICACY OF IRON SUCROSE GIVEN INTRAVENOUSLY IN ANEMIC WOMEN

¹Dr. Samia Hafeez, ²Dr. Sidra Mehboob, ³Dr. Beenish Ashfaq

¹Nishtar Medical College & Hospital, Multan

²Punjab Medical College, Faisalabad

³Pharmacy Dept Quaid-i-Azam University, Islamabad

Abstract:

Objective: To determine the different anemia levels in different anemia patients, to observe the effect of sucrose given I / V in anemic patients of different age groups and to evaluate the effects of I / V iron sucrose and blood transfusion in anemia patients given simultaneously. Anemia recovery visits in pregnant women.

Study Design: A Prospective Study.

Place and Duration: In the Obstetrics and Gynecology Department, Holy Family Hospital, Rawalpindi for one year duration from April 2016 to April 2017.

Methodology: Fifty patients of prenatal primipara with anemia having hemoglobin (Hb) <11 g / dl at the 3rd trimester were selected for the analysis. The cases distribution was according to the categorization of anemia and socioeconomic status (SE) was recorded as moderate (8 to 10.9 gm / dL), 5 to 7 gm / dL in severe cases and less than 4 gm / dL in very severe cases and I from V to SE were presented in accordance with the BGP Classification. The effect of the prenatal visit was also included in the prenatal interval, p2 prenatal and p3 prenatal interval. For the most common type of anemia diagnosis Blood smear was assessed in the study population. To regulate iron sucrose an intravenous route was used.

Findings: This study proved that moderate anemia (77%) is more frequent in the people. The incidence of anemia was found to be more prevalent in SE class IV (45%) and non-illiterate (65%) patients. The anemia most common influencing factors for were malaria (14%), worm infestation (16%), tuberculosis (6%) and adolescent menorrhagia (10%). In addition, p2 prenatal visits were observed in 44 (88%) of 50 patients. In this study it is observed that hypochromic microcytic anemia (73%) was the most usual, preceded by dimorphic anemia in the population. In I / V sucrose administration we not noted any allergic reaction in this study.

Conclusion: This study showed that iron sucrose given intravenously is the rapid and most effective treatment for anemia mainly in the 3rd trimester of pregnancy and preoperatively in the disease. It also reduces the need for transfusion of blood pre-operatively patients and the third gestation and quickly corrects anemia.

Key words: Iron sucrose, iron deficiency anemia, anemia pregnancies.

*** Corresponding author:**

Dr. Samia Hafeez,
Nishtar Medical College & Hospital,
Multan

QR code



Please cite this article in press Samia Hafeez et al., *Study to Determine the Safety and Efficacy of Iron Sucrose Given Intravenously In Anemic Women.*, Indo Am. J. P. Sci, 2018; 05(09).

INTRODUCTION:

Pregnancy and birth are events that are both universally celebrated. A mother tells her mother when she grows up in the womb. About one-third of the Global population is anemic. According to the WHO, the anemia prevalence in pregnant women is 18% in developed countries in South East development.² and relatively high 35-75% (average 56%) is higher prevalence of Asian anemia. According to the World Health Organization among Southeast Asian countries, the prevalence varies between 58%, although it is the highest prevalence in Pakistan. In Pakistan, anemia, mortality and morbidity continue to be a common cause. low prevalence of iron and high demand among the causes of iron, incompatible metabolism, high demand of iron and multiple gestation, recurrent pregnancy, infectious diseases, blood loss-induced labor intensive menstrual cycle, inflammation caused by pregnancy women may cause some important factors infects.

Anemia is describe as "hemoglobin less than 11 g / dl and hematocrit less than 0.33" according to WHO,. In pregnancy, iron needs to reach the mass of red blood cells in the deadly mother, causing placental blood and blood loss during labor. In developing countries, anemia in pregnancy is the most common medical problem which causes 40-60% of maternal mortality. Hemoglobin (Hb) is classified as moderate Hb levels (7-10,9 g / dL), severe (4-6,9 g / dL) and very severe in current practice (& Lt; 4 g / dL). Although it responds well to iron fortification, anemia due to iron deficiency is a major health problem worldwide. New approaches are needed for effective management of this situation. Initially, treatment for iron dextran and iron sorbitol citrate was the main treatment. The main disadvantage of this treatment was that prior to injections due to severe anaphylactic reactions, a test did not require dose. However, iron sucrose has been announced to be effective and safe in many studies during pregnancy. The trial of iron sucrose is not necessary for the desire. Both iron sucrose and ferric gluconate are second generation i.v. iron formulations, i.v. iron dextran. The iron required is dependent on the documented Hb level and pre-pregnancy weight. The following formula is used to calculate the iron sucrose dose:

$$\begin{aligned} &\text{Required iron dose (mg)} \\ &= (2.4 \times (\text{target Hb} - \text{actual Hb}) \times \text{pre-} \\ &\text{pregnancy weight (kg)}) \\ &+ 1000 \text{ mg for replenishment of stores} \end{aligned}$$

Some properties of different formulations of intravenous iron are shown in Table 1. For this reason, we evaluated the efficacy and safety of iron

sucrose given intravenously in patients with proven iron deficiency with Hb <11 g / dl in primary patients, third quarter.

Table 1: Some characteristics of the different intravenous iron formulation

	Iron Gluconate	Iron Sucrose	Low molecular weight iron dextran	Ferric carboxy-maltose
Carbo-hydrate shell	Gluconate (mono)	Sucrose (dia)	Dextran (branched poly)	Carboxy-maltose (branched poly)
Molecular weight (KD)	289-440	30-60	165	150
Initial distribution volume (L)	6	3.4	3.5	3.5
Plasma half-life (h)	1	6	20	16
Direct Iron donation to transferring (% injected dose)	5-6	4-5	1-2	1-2
Test dose required	No	No	Yes	No
Iron content (mg/mL)	12.5	20	50	50
Maximal Single dose (mg)	125	200-300	20 mg/kg	15mg/kg

MATERIALS AND METHODS:

This prospective study was held in the Obstetrics and Gynecology Department, Holy Family Hospital, Rawalpindi for one year duration from April 2016 to April 2017. The approval of the corporate ethics committee was taken before it started to work. Written patient was given all illness before I started to work. A prospective, open, single-center study was conducted in 50 primiparous patients with proven iron deficiency with Hb <11 g / dl at the third trimester. Women in the third trimester of pregnancy with a Hb <11 gm / dl were included in the study and their written approval was given. Depending on other reasons, women with iron deficiency anemia, multiple pregnancies, premature birth risk, and recent blood transfusions, thalassemia, and other medical disorders were not included in the study. Initial studies such as liver and kidney function tests, routine microscopy and culture sensitivity, urine testing, fecal examinations for ovules and cysts were performed in the current study. The cases distribution according to the classification of anemia and socioeconomic status (SE) was recorded as moderate (8 to 10.9 gm / dL), 5 to 7 gm / dL in severe cases and less than 4 gm / dL in very severe cases and I from V to SE are presented in accordance with BG Prasad Classification (BGP) 21. The effect of the prenatal visit was presented in prenatal, p2 prenatal visit and p3 prenatal visit. In the study population

most common type of anemia was analyzed by Blood smear. Iron sucrose was administered by intravenous infusion.

Statistical analysis: with SPSS version 15 Statistical analysis was performed. All values are expressed as a percentage (%) and an average \pm ss. $P < 0.5$ was considered significant.

RESULTS:

The mean age of the patients was 27.8 ± 3.9 (range 21 to 34) years and the mean parity was 1.3; Mean gestational age (PDG) was 25.69 ± 4.82 (14-32) weeks at the time of diagnosis. At baseline, mean Hb was 7.63 ± 0.61 g. 76% (4-6,9 g / dL) of patients have 14% severe, moderate anemia (8-10,9 g / dL) and 10% severe anemia (<4 g / dL) (Table 2).

Table 3: Distribution of various grade of anaemia according to socioeconomic condition (BGP classification)

SE Status	No of cases			Total	
	Moderate (7-10.9 g/dL)	Severe (4-6.9 g/dL)	Very Severe (<4 g/dL)	No of cases	Percentage (%)
I	2	-	-	2	4
II	4	1	-	5	10
III	10	1	1	12	24
IV	16	3	3	22	44
V	6	2	1	9	18

According to the education of all registered patients, 6% and 2% of the cases were divided into secondary, middle, middle, literate, primary and graduate and 64%, 8% of the patients were literate and 20% of the patients were in primary school, junior high school, undergraduate and doctorate degrees.

Malaria (14%), menorrhagia puberty (10%) and tuberculosis (TB) (6%) were analyzed according to the preliminary factor for anemia on history. (Table 5)

Table 5: Distribution of cases according to the predisposing factor for anaemia in past history

Predisposing factor	No of cases	Percentage (%)
Malaria	7	14
Worm Infestation	8	16
UTI	2	4
Puberty menorrhagia	5	10
Piles	2	4
Bleeding disorder	-	-
Dysentery	2	4
Dry causing BM suspension	-	-
Other chronic disease like TB	3	6
Gastritis/Gastric ulcer	2	4

Table 6 shows the effect of prenatal visits among all patients showing that anemia in 44 (ie, 88%). The most frequent type of anemia was microcytehypochrmic (72%). The percentages of other blood-smearing palliatives are

Table 2: Distribution of cases according to grading of anaemia

Types of anaemia	No of cases	Percentage (%)
Moderate (7-10.9 g/dL)	38	76
Severe (4-6.9 g/dL)	7	14
Very Severe (<4 g/dL)		

A complete increase in I / V sucrose injection (4 amperes) was observed in 68% of patients with anemia within a week after a full dose of 1.2 gr, an overall increase of%. In 22% of cases of iron sucrose co-administered with blood transfusion, the level of Hb was increased to $> 2.2\%$ in one week. According to the BGP classification, anemia was analyzed in socioeconomic terms (I to V in the case of varying degrees) patients and patients in this class IV BGP classification in study (entry Rs 773 44 - 1546%). In Class I, II, III and V, the percentage of patients was 4, 10, 24 and 18, respectively (Table 3).

Table 4: Distribution of cases according to education profile of patients

Education	No of cases	Percentage (%)
Illiterate	32	64
Primary	10	20
Middle	4	8
High School	3	6
Inter	-	-
Graduate	1	2

Table 6: Distribution of cases according to peripheral blood smear picture

Blood smear palliative	No of cases	Percentage (%)
Microcytic hypochromic	36	72
Dimorphic	8	16
Megaloblastic	2	4
Normocytic hypochromic	3	6
Microcyte hypochromia with reticulocytosis	1	2

shown in Table 6 with megaloblastic normocytic and microcytic anemia, dimorphic, with reticulocytosis anemia (Table 6).

DISCUSSION:

In this study, we can conclude that iron I / V sucrose therapy is the most rapid and effective treatment for correcting anemia in time interval, especially in the 3rd trimester of pregnancy and in preoperative period of patients. It also reduces the need for transfusion of blood in pre-operative patients at the 3rd trimester and corrects the anemia rapidly. According to studies, there is a maternal morbidity of <8 g% in Hb level in pregnancy. Hb <5 g% is associated with pulmonary edema and cardiac decompensation. Even 200 ml of blood loss during labor can cause a sudden death and shock in these types of women. Iron sucrose is very safe and effective with minor side effects (0.5% of cases) such as metallic taste, redness of the face and burning in the injection site. This high tolerance to iron sucrose is due to the release of complex slowly from iron. Another reason is that sucrose is caused by low allergenicity. Studies to date have shown that iron sucrose is a single death due to intravenous injection. It was due to very slow infusion (1-2 hours) or free radicals released from iron sucrose. This case is not mentioned in any study, but it is stated in the clinical trial enrollment site. In developing countries, hookworm infection is one of the causes of anemia. Our study also showed that worm infestation is one of the main and common predisposing factors for anemia. It is clear that routine antenatal treatment is not recommended for pregnancy. However, due to the high prevalence in India, it is recommended that such treatment be given to pregnant women with anemia. group and non-randomize working.

CONCLUSION:

In conclusion, our results show that intravenous iron therapy with sucrose is effective in the treatment of moderate anemia in pregnant women. It is known that intramuscular preparations are associated with local side effects. Negative side effects of iron sucrose complex and IV treatment were present. It caused a rapid increase in the level of hemoglobin and it was faster to change stores. Long-term comparative studies are needed to assess whether it can be used as a peripheral.

REFERENCES:

1. Dalal, Monika, Ritu Goyal, Smiti Nanda, Pushpa Dahiya, Krishna Dahiya, and Shikha Madan. "Oral Versus Intravenous Iron for Treatment of Iron Deficiency Anaemia in Pregnancy: A Randomized Controlled Trial." *Indian Journal of Public Health Research & Development* 9, no. 6 (2018).
2. Agarwal, Rajni, and Shelesh Kr Goel. "Comparative study of efficacy and safety of intravenous iron sucrose versus oral iron in the treatment of iron deficiency anaemia in pregnancy." *International Journal of Contemporary Surgery* 6, no. 2 (2018): 79-82.
3. Naqash, Amreen, Rifat Ara, and Ghulam N. Bader. "Effectiveness and safety of ferric carboxymaltose compared to iron sucrose in women with iron deficiency anemia: phase IV clinical trials." *BMC women's health* 18, no. 1 (2018): 6.
4. Govindappagari, Shravya, and Richard M. Burwick. "Treatment of Iron Deficiency Anemia in Pregnancy with Intravenous versus Oral Iron: Systematic Review and Meta-Analysis." *American journal of perinatology* (2018).
5. Mahajan, Aakanksha, Bawa R. Bhagat, Shashi Gupta, Bhanu Mahajan, and Manvi Verma. "A comparative study of efficacy and safety of intravenous ferric carboxymaltose versus iron sucrose in the treatment of iron deficiency anaemia of pregnancy in a tertiary care hospital." *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* 7, no. 5 (2018): 1938-1942.
6. Chaudhry, G., Biswas, R., & Sharma, S. (2018, March). Ferric Carboxymaltose versus Iron Sucrose complex in Iron deficiency anemia in women with benign gynaecological disorders.-A randomised controlled trial. In *BJOG-AN INTERNATIONAL JOURNAL OF OBSTETRICS AND GYNAECOLOGY* (Vol. 125, pp. 52-52). 111 RIVER ST, HOBOKEN 07030-5774, NJ USA: WILEY.
7. Khaliq, Baba Iqbal, Lateef Ahmad Wani, Nousheen Majeed, Nausrat Ali, and Bilques Khurshed. "Hematological Evaluation of Anemic Pregnant Females on Intravenous Iron Sucrose Therapy in A Tertiary Care Hospital." *International Journal of Research* 5, no. 7 (2018): 1611-1622.
8. Auerbach, Michael, Glenn M. Chertow, and Mitchell Rosner. "Ferumoxytol for the treatment of iron deficiency anemia." *Expert Review of Hematology* just-accepted (2018).
9. Daniilidis, Angelos, Nikolaos Panteleris, Efthymia Vlachaki, Christian Breyman, and Efstratios Assimakopoulos. "Safety and efficacy of intravenous iron administration for uterine bleeding or postpartum anaemia: a narrative

- review." *Journal of Obstetrics and Gynaecology* 38, no. 4 (2018): 443-447.
10. Qassim, Alaa, Ben W. Mol, Rosalie M. Grivell, and Luke E. Grzeskowiak. "Safety and efficacy of intravenous iron polymaltose, iron sucrose and ferric carboxymaltose in pregnancy: A systematic review." *Australian and New Zealand Journal of Obstetrics and Gynaecology* 58, no. 1 (2018): 22-39.
 11. Haldar, Partha, Shashi Kant, Vikas Yadav, Jitendra Majhi, Sumit Malhotra, Ravneet Kaur, Rakesh Kumar et al. "Effect of intravenous iron sucrose on hemoglobin level, when administered in a standard-dose, to anemic pregnant women in rural Northern India." *Journal of Family Medicine and Primary Care* 7, no. 4 (2018): 762.
 12. Allen, R.P., Picchietti, D.L., Auerbach, M., Cho, Y.W., Connor, J.R., Earley, C.J., Garcia-Borreguero, D., Kotagal, S., Manconi, M., Ondo, W. and Ulfberg, J., 2018. Evidence-based and consensus clinical practice guidelines for the iron treatment of restless legs syndrome/Willis-Ekbom disease in adults and children: an IRLSSG task force report. *Sleep medicine*, 41, pp.27-44.
 13. Al, Mohammed Qasim Yahya Mal-Allah. "The effects of ferrous sulfate as an iron supplement on ejection fraction in patients with iron deficiency anemia associated with decompensated heart failure." *Mustansiriya Medical Journal* 17, no. 1 (2018): 22.
 14. Muñoz, M., Peña-Rosas, J.P., Robinson, S., Milman, N., Holzgreve, W., Breyman, C., Goffinet, F., Nizard, J., Christory, F., Samama, C.M. and Hardy, J.F., 2018. Patient blood management in obstetrics: management of anaemia and haematinic deficiencies in pregnancy and in the post-partum period: NATA consensus statement. *Transfusion Medicine*, 28(1), pp.22-39.
 15. Shim, Jae-Yoon, Moon Young Kim, Young Ju Kim, Young Lee, Jeong Jae Lee, Jong Kwan Jun, Jong Chul Shin et al. "Efficacy and safety of ferric carboxymaltose versus ferrous sulfate for iron deficiency anemia during pregnancy: subgroup analysis of Korean women." *BMC pregnancy and childbirth* 18, no. 1 (2018): 349.