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Assesment of Efficacy of Parenteral Iron Sucrose in Management of Anaemia in Congestive Heart Failure Patients

Dr. Muppidi Anusha[1], Dr. Sangeetha Uppala[2], Dr. D. Swarna Latha[3], R. Divya[4], DakshirajuSai Kumar[4], Shaik. Mohammad Jabbir[4], Guddeti Sreedhar[4]

1.Post graduate, Department of General Medicine, Government medical college(RIMS), Kadapa, Andhra Pradesh, India.
2.Post graduate, Department of General Medicine, Government medical college(RIMS), Kadapa, Andhra Pradesh, India.
3.Professor&Prinicipal, Department of Pharmacognosy, Annamacharya college of Pharmacy, Rajampet, Kadapa, Andhra Pradesh, India.
4.Pharm.D Interns, Department of Pharmacy Practice, Annamacharya college of Pharmacy, Rajampet, Kadapa, Andhra Pradesh, India.

Abstract:
Background:
Anemia and iron deficiency are important and common co-morbidities that often coexist in patients with heart failure. Both conditions, together or independently, are associated with poor clinical status and worse outcomes. Whether anemia and iron deficiency are just markers of heart failure severity or whether they mediate heart failure progression and outcomes and therefore should be treated is not entirely clear.Intravenous iron therapy in iron-deficient patients with HF and reduced ejection fraction has been shown to alleviate HF symptoms and improve exercise capacity and quality of life.
The objectives of the study include estimating the haemoglobin levels, haematocrit levels & also comparing the symptoms among the patients before and after treatment.
Materials And Methods:
A prospective observational study was conducted for a period of six months at RIMS, Kadapa. 60 patients were recruited based on inclusion criteria.
Results and conclusion:
In a total of 60 patients, 40 were females and 20 were males. Most of them fall under age group of 60-69yrs. They were divided into two groups (Group A (5doses) and Group B (7 doses) were each dose contain 100mg of iron sucrose) each group contains 30 patients. There was significant increase in the hemoglobin levels of both group of patients with hemoglobin raising after 10 days of treatment. Similarly, haematocrit levels also increased significantly in both groups. After the treatment all the symptoms were reduced in most of the patients in both the groups. This study concludes that the use of iron sucrose in managing anemia in CHF patients was very effective and beneficent.
Key words:*Iron deficiency, Intravenous, Parenteral, Haematocrit, Heart failure.*

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I. Introduction:

Anemia is common and is a powerful independent predictor of death and hospitalization in a broad spectrum of patients suffering from systolic and diastolicdysfunction, new-onset HF and advanced chronic HF.[1,2] Iron deficiency (ID) constitutes the most common form of anemia and malnutrition worldwide, affecting more than 2 billion people globally.[3,4] The prevalence of anemia in patients with congestive HF (CHF) ranges between 4% and 61% (median 18%).[5] Causes of ID in HF include gastrointestinal or genitourinary blood loss related to the use of antiplatelet drugs and/or oral anticoagulation, impaired nutrition, malabsorption (due to congestion and abnormal production of hepcidin[6], and reduced intracellular uptake of iron (due to reduced transferrin receptor-1 (TfR1) expression in cardiomyocytes).[7] The trace element iron is metabolically an active element as it is the core component of oxygen transport and storage protein, hemoglobin (Hb) and myoglobin, respectively. It is a cofactor of oxidative enzymes and also an element of structural protein of the electron transport chain in mitochondria.[8] Thus, iron has a role both in providing oxygen to the body fuel and enhancing the oxidative capacity of energy manufacturing factory of the myocytes. Thus, the iron deficiency state could have role in pathogenesis of progression of heart failure. Various intravenous (IV) iron complexes, such as ferric carboxymaltose (FCM), ferric hydroxide sucrose, ferric gluconate, and ferric hydroxide dextran are available.

There are limited comparative data for the available IV iron preparations.[9] Advantages of IV iron therapy include the small number of injections required, rapid improvement in iron parameters,[10] and the cost-effectiveness, probably due to improved Quality of life and reduced HF hospitalisations.[11]

II. Aim And Objectives:

Assessment of efficacy of parenteral Iron sucrose in management of anemia in congestive heart failure patients.To Estimate the haemoglobin levels, haematocrit levels among the patients before and after treatment. To compare the symptoms among the patients before and after treatment.

III. Methodology:

It is a Prospective Observational study conducted in department of general medicine in RIMS hospital, Kadapa. This Study was conducted over a period of six months from August 2018 to January 2019; with average sample size was taken as 60.The patients who are suffering with congestive heart failure along with anemia with Hb values < 7gm/dl where included in this study. The patients who are suffering with other cardiac diseases, respiratory disease, age less than 18 years, who are not willing to participate in the study, Pregnancy and lactating women are excluded in this study. Data would be collected from treatment charts, prescriptions and case sheets, questionnaire forms subjects included in a study.

IV. Statistical Analysis:

Microsoft excel is used for recording the data of recruited subjects and calculating mean, standard deviation etc. Student unpaired t test is used to calculate the t-value and p-value.

V. Results And Discussion:

Among the 60 research subjects known female 40 (67%) and males constitute about 20 (33%) with age group of 60 – 69 where more prone to iron deficiency anemia with congestive heart failure.These results were similar to the study performed by Aidan P. Bolger et al.,[12] where the mean age among the patients was 64 ± 14.

The included sixty patients were divided into two groups (Group A (5doses) and Group B (7 doses) were each dose contain 100mg of iron sucrose) each group contains 30 patients. Among the 30 patients of Group A (5 doses) there were 18 males and 12 females. In Group B (7 doses) there were 2 males and 28 females. There was significant increase in the hemoglobin levels of both group of patients with hemoglobin raising from 5.77 ± 0.722 (Mean ± SD) at baseline to 8.31 ± 0.84 in group A (5 doses) where as in group B hemoglobin raised from 5.18 ± 0.64 at baseline to 8.48 ± 1.003 after 10 days of treatment with p value being < 0.0001 which was statistically highly significant.

Similarly, haematocrit levels also increased significantly in both groups from 25.17 ± 4.23 at baseline to 34.65 ± 3.901 in group A where as in group B haematocrit raised from 27.0 ± 3.49 at baseline to 38.17 ± 3.908 after treatment with p value being < 0.0001 in both groups which was statistically highly significant.

The most common symptoms among the patients were fatigue, weakness, oedema followed by nausea, chest pain, cough and the less common were irregular heartbeat, paleness, shortness of breath and the least common symptom was mental confusion in both the groups. After the treatment all the symptoms were reduced in most of the patients in both the groups.These results were supported by the study performed by Darlington O. Okonko.,[13] where the symptoms were reduced significantly with $p < 0.001$ within-group differences compared with baseline.

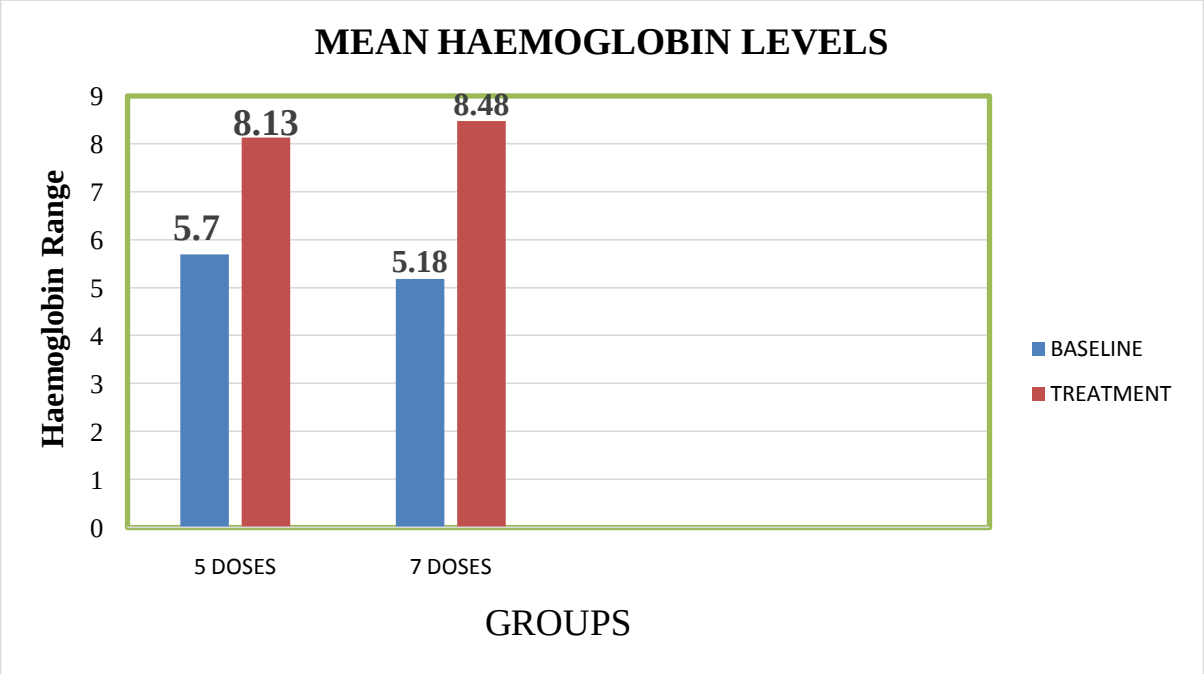

Fig 1: Comparison of Haemoglobin levels in two groups before and after treatment.

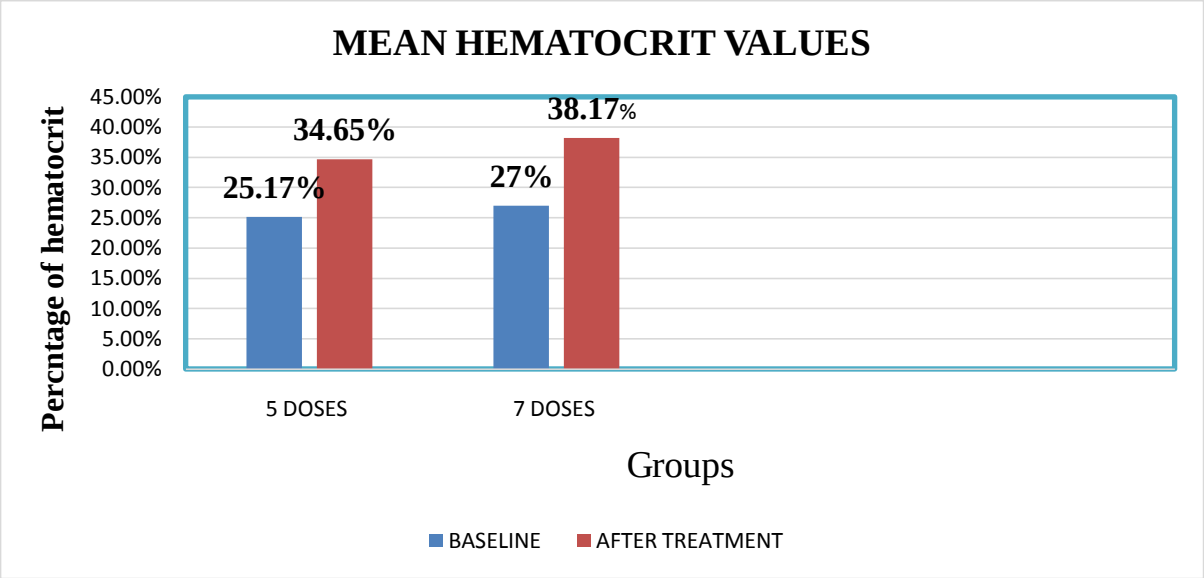

Fig 2: Comparison of Haematocrit levels in two groups before and after treatment.

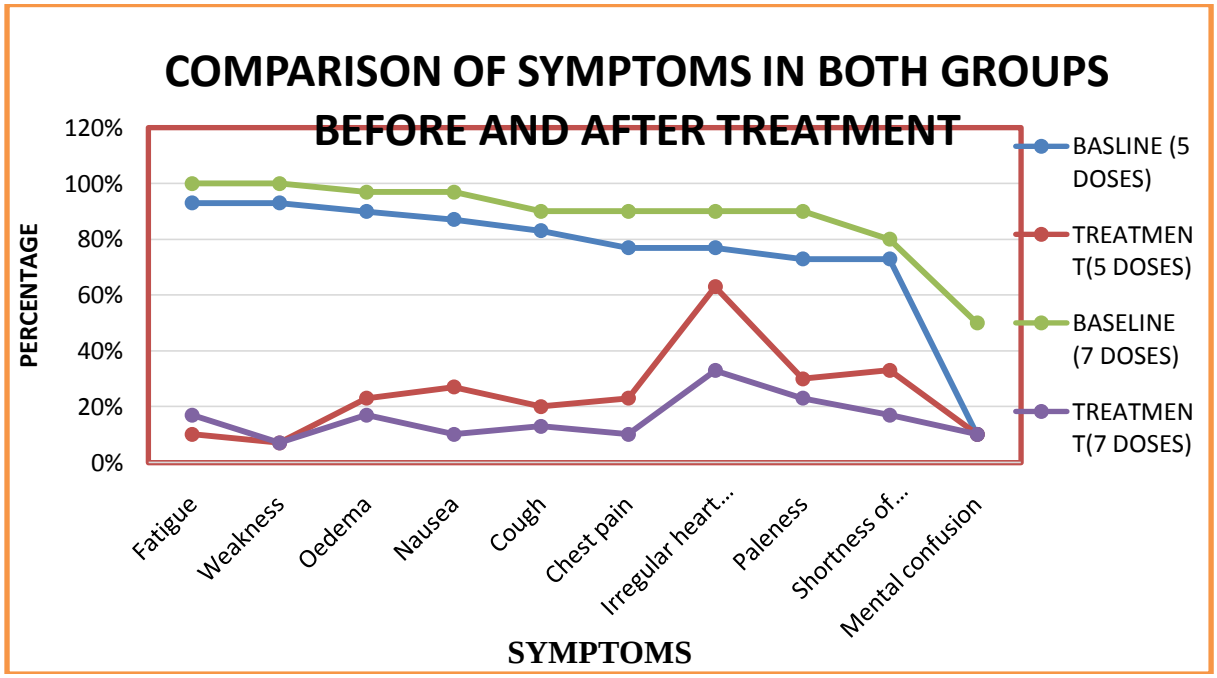

Fig 3: Comparison of symptoms in patients among the two groups before & after treatment.

VI. Conclusion:

This study highlights that parenteral iron sucrose is very effective in management of anemia in CHF patients as it significantly increased the haemoglobin and haematocrit levels and reduced the symptoms significantly in short period of time.So, this study concludes that the use of iron sucrose in managing anemia in CHF patients was very effective and beneficent.

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