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ORIGINAL ARTICLE

Iron Deficiency in Patients Presenting with Somatic Symptoms and their Outcome with IV Iron Therapy

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ABSTRACT

Objectives: To determine the effect of IV iron therapy on patients with Iron deficiency presenting with somatic symptoms.

Materials and Methods: The design of this study was The Quasi-experimental study design and this study was conducted in Shaheed Mohtarma Benazir Bhutto Medical University, Larkana. This study was conducted in the duration of 6 months from July 2022–Dec 2022. Totally 90 patients were enrolled. 5ml venous blood sample were collected from of each patient and sent to laboratory of the hospital for complete blood count and serum ferritin level. Patients with iron deficiency were treated with IV iron. Then after eight-week treatment the patients were followed again and 5ml blood were collected in EDTA containing tube. Serum ferritin level was evaluated again at the end of 8 weeks. Somatic scoring scale was used to assess somatic symptom burden before and after IV iron therapy.

Results: Out of 90 patients, 40.0% were male and 60.0% were female with mean age of 39.70± 7.30 years. Most of the patients were of age group 41-50 years, followed by the age group of 31-40 years and least number of patients were of age group of 20-30 years. The mean difference of somatic score of our enrolled patients were 7.01±0.33 with P-value of <0.05. The mean serum Ferritin difference between Pre-Treatment and Post-Treatment were found 37.28±-2.6 (ng/ml) with P-value of <0.05.

Practical implication: The present study will help the doctors to treat the patients with Iron deficiency presenting with somatic symptoms on priority basis by using IV iron therapy. That will lead to early treatment of the patients and also avoid further complication and miss diagnosis of the patients.

Conclusion: It is concluded that patients presenting with somatic symptoms and having iron deficiency improved promptly with IV iron therapy.

Keywords: Iron deficiency, somatic symptoms**,** IV Iron therapy, serum Ferritin, Somatic Scoring scale

INTRODUCTION

In many regions of the world, especially among females, iron deficiency is the most common nutritional issue and the leading cause of anaemia. One-fourth of the world's population suffers from anaemia, which contributes 8.8% to the overall disease burden in the world. In both sexes and in all nations, iron deficiency is the leading cause of anaemia, with women being more frequently affected than men. This means that the prevalence of iron insufficiency is about ten times higher in women with regular periods than it has been documented for men of the same age. Anemia prevalence rises with age3 and in the hospital setting. [1-3] It happens at every stage of life, but it is more common among pregnant women and small children. Anemia reduces productivity and raises health care expenses. [4, 5] One of the most significant contributing reasons to the global burden of anaemia was thought to be iron deficiency anaemia (IDA) in 2002.[6] It is believed that 5–10% of dietary iron is absorbed, but when iron stores are depleted, absorption rises by three to five times [7]. Growth retardation, exercise intolerance, behavioural abnormalities, and aberrant thermogenesis are some of the effects of IDA [8] .

Two billion people worldwide suffer from anaemia, the majority of whom have iron deficiency anaemia (IDA), according to UNICEF research. This is especially true in developing and undeveloped nations, where 40 to 50 percent of children under the age of five have iron deficiency.[6] Previous research stated that IDA in children influenced the emergence of anxiety, depression, social, and attention-deficit disorders.(9) iron-deficiency anaemia frequently progresses gradually. Patients may not exhibit any symptoms at first or they may be minor. Patients may have one or more of these symptoms as it worsens. These symptoms includes fatigue, weakness, headaches, decreased body temperature, sallow, yellow, or pale skin, fast or irregular heartbeat, chest pain or shortness of breath, especially after vigorous exertion, and brittle nails.[10, 11] According to WHO/UNICEF/UNU (2001), IDA was defined as ferritin 15 ng/ml and iron deficiency anaemia as ferritin 15 ng/ml with haemoglobin 12 g/dl.[6] All individuals with iron deficiency anaemia should receive immediate treatment, as there is ample evidence to back this. This is because treatment is known to enhance physical and mental well-being, as well as reduce fatigue and cognitive impairment.[3] So the present study was conducted in order to evaluate the iron deficiency in female patients presenting with somatic symptoms and their outcome with IV Iron therapy. The results of the current study will assist medical professionals in prioritising the use of IV iron treatment to treat individuals with iron deficiency who come with somatic symptoms. That will enable patients to receive treatment sooner and prevent subsequent complications and incorrect diagnoses.

Objective: To determine the effect of IV iron therapy on patients with Iron deficiency presenting with somatic symptoms.

MATERIALS AND METHODS

Study Design and setting: The Quasi-experimental study was conducted in Shaheed Mohtarma Benazir Bhutto Medical University, Larkana.

Duration of the study: Duration of the study was 6 months (July 2022–Dec 2022).

Sample Size: The sample size was 90 by using the online WHO sample size calculator by taking confidential interval 95% and margin of error 10% and anticipated population of 82%.[12]

Inclusion Criteria:

- Patients with iron deficiency.
- Patients with a history of headache, body pain.
- Patients suffering from depression.
- Patients of 20-50 years of age.
- Both genders.

Exclusion Criteria:

- Patients with thalassemia.
- Patients suffering from anemia.
- Patients not willing to participate in study.
- Patients suffering from any chronic illness or infection.[25,26]

Methods: After the permission of Research evaluation unit (REU) of College of Physicians and Surgeons Pakistan (CPSP), a total of 90 patients were enrolled and written informed consent for the study was obtained from the guardian of patients. A detailed clinical history and thorough physiological examination of all the

patients was done. 5 ml blood sample were collected from the patients using aseptic techniques in EDTA tubes. Then Complete blood count was measured. Hematological parameters included hemoglobin, hematocrit, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), red blood cell count (RBC), white blood cell count (WBC), and platelets). Serum ferritin level of all the patients were tested. The data were collected. Patients with iron deficient were treated with IV iron. Then after eight week treatment the patients were followed again and 5 ml blood were collected in EDTA containing tube. Serum ferritin level was evaluated again at the end of 8 weeks. Somatic scoring scale was used to assess somatic symptom burden before and after IV iron therapy. The data were collected in a predesign questionere.

Table 1: Somatic Scoring scale

During the past seven days, how much have you been bothered by the following symptoms?

Symptom	Not at all	A little bit	Somewhat	Quite a bit	Very much
Back pain	0	1	2	3	4
Chest pain or shortness of breath	0	1	2	3	4
Dizziness	0	1	2	3	4
Feeling tired or having low energy	0	1	2	3	4
Headaches	0	1	2	3	4
Pain in your arms, legs, or joints	0	1	2	3	4
Stomach or bowel problems	0	1	2	3	4
Trouble sleeping	0	1	2	3	4

Score: _____

Scoring: None to minimal (0 to 3); low (4 to 7); medium (8 to 11); high (12 to 15); very high (16 to 32).

Adapted with permission from Gierk B, Kohlmann S, Kroenke K, et al. The Somatic Symptom Scale-8 (SSS-8): a brief measure of somatic symptom burden. JAMA Intern Med. 2014;174(3):400.

Statistical Analysis: SPSS (version 25.0) was used for the analysis of data. The data was presented in the form of table and graph.

RESULTS

The study was conducted on total 90 patients, between age 20-50 years, out of which 36 (40.0%) patients were male and 54 (60.0%) patients were female as shown in table 2-0 and Figure 1-0. The somatic symptom score were given in table 1-0. The mean somatic score of our enrolled patients were mostly 12.8±2.25 which was categorized as high (table 2-0).

Table 2: Distribution of Patients According to Gender With Mean Age And Somatic Score (n=90)

Variable	Frequency	Percentage
Gender:		
Male	36	40.0
Female	54	60.0
	Mean	SD
Age	39.70	7.30

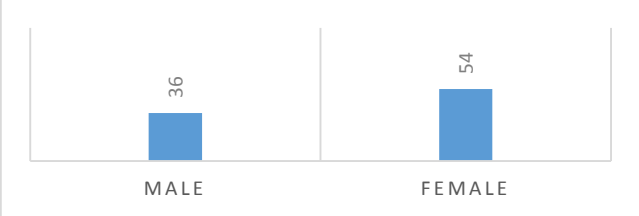

Figure 1: Graphical Representation of Gender

In order to determine the statistical difference between Pre-intervention and post-intervention, p-value was calculated through Paired Sample T-Test. The mean ferritin difference between Pre-Treatment and Post-Treatment were found 37.28±-2.6 with P-value of <0.05. The mean somatic score difference between Pre-Treatment and Post-Treatment were found 7.01±0.33 with P-value of <0.05 (Table 3).

Table 3: Pre-Intervention and Post-Intervention Comparison (n=90)

Variable	Pre-intervention	Post-intervention	Difference	P-value
Serum Ferritin (ng/ml)	8.92±9.07	46.2±6.47	37.28±-2.6	0.00
Somatic score	12.82±2.25	5.81±1.92	7.01±0.33	0.00

Table 4: Pre-Treatment and Post-Treatment Significance in Male Patients (n=36)

Variable	Pre-Treatment	Post-Treatment	Difference	P-value
Serum Ferritin (ng/ml)	7.9±2.4	46.6±6.8	38.7±4.4	0.00
Somatic score	13.27± 2.6	5.52±1.81	7.75±0.79	0.00

Table 5: Pre-Treatment and Post-Treatment Significance in Female Patients (n=54).

Variable	Pre-Treatment	Post-Treatment	Difference	P-value
Serum Ferritin (ng/ml)	9.5±11.5	45.9±6.28	36.4±-5.2	0.00
Somatic score	12.51±1.9	6.00±1.9	6.51±0.00	0.00

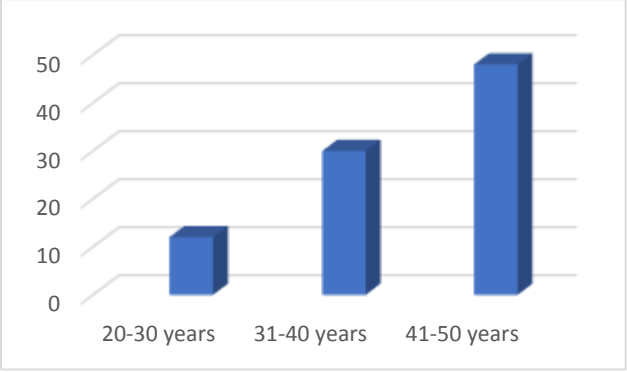

Figure 2: Graphical Representation of distribution of patients according to age group (n=90)

DISCUSSION

Iron deficiency is one of the most prevalent dietary deficits in the world, as is widely known(13). The effects and symptoms on the body depend on how long and how severe the iron deficiency. Iron deficiency symptoms that have an impact on the patient's quality of life are the major reason iron therapy is prescribed[14]. For the most sensitive and specific iron deficiency diagnostic methods, serum ferritin levels are measured [15]. In spite of haemoglobin levels, ferritin levels below 20 g/l indicate an iron deficit. Even if there are still some limited iron stores at ferritin levels of 20 to 50 g/l, it is thought that a certain proportion of women will already be experiencing symptoms at these levels, which is why these levels are considered to be in the grey area. Unless the patient also has an infection, iron deficiency anaemia can be ruled out if ferritin levels are above normal ranges (> 50 g/l)[16]. The symptoms of an iron deficiency include fatigue, headaches, hair loss, impaired attention, and generally decreased performance[17]. Persons without iron deficiency can also suffer from fatigue just as persons with iron deficiency do[18]. In our study the patients were presented with somatic symptoms such as palpitation, depression, and headache and body pain. The present study was conducted inorder to determine the effect of IV iron therapy on patients with

Iron deficiency presenting with somatic symptoms. The present study was female dominant study. Mostly patients were treated with iron supplementation orally. If oral treatment with iron supplements is ineffective, parenteral iron administration is recommended. So in our study we used IV route for iron therapy. And we found a significant difference between pretreatment and post treatment serum ferritin level. This is female dominant study so as compared to men, women are significantly more likely to naturally experience an iron shortage [19]. It has been determined that the prevalence of iron insufficiency in women with regular periods is almost ten times higher than that recorded for men of the same age[16, 20]. This is brought on by a combination of an inadequate or insufficient daily dietary supply of iron and the regular loss of blood and iron during menstruation. Whereas the daily metabolic iron loss in men is 1.5 mg/day[21], it is about 0.5 mg/day greater in women and reaches 2 mg/day in those who have "regular" menstrual cycles (80 ml/month)[16, 22].

There are three ways to administer iron: orally, intramuscularly, and intravenously. The simplicity and inexpensive cost of oral iron have advantages, but it is constrained by adverse effects, poor compliance, poor absorption, and low efficacy. The best way to ensure that readily available iron is delivered to the bone marrow is intravenously, although this method necessitates more intensive clinical oversight. The bioavailability, side-effect profiles, and maximum dose for a single delivery of the IV iron formulations vary substantially (23). Oral iron supplements have a number of problems, including adverse effects, low compliance, and poor gastrointestinal absorption. Oral iron therapy is commonly (up to 20% of patients) met with gastrointestinal intolerance, which frequently results in low compliance (24). Recently, there has been a sharp rise in the usage of intravenous iron. In our study by IV iron therapy, the iron profile of patients improves. So we recommend the IV iron therapy for patients presenting with somatic symptoms.

CONCLUSION

It is concluded that patients presenting with somatic symptoms and having iron deficiency improved promptly with IV iron therapy.

REFERENCES

1. Benoist B. Worldwide prevalence of anaemia 1993-2005: WHO global database on anaemia. Benoist B, McLean E, Egli I, Cogswell M, editors. World Health Organization Cataloguing-in-Publication Data. 2008.
2. Kassebaum NJ, Jasrasaria R, Naghavi M, Wulf SK, Johns N, Lozano R, et al. A systematic analysis of global anemia burden from 1990 to 2010. Blood, the Journal of the American Society of Hematology. 2014;123(5):615-24.
3. Jimenez K, Kulnigg-Dabsch S, Gasche C. Management of iron deficiency anemia. Gastroenterology & hepatology. 2015;11(4):241.
4. Nissenson AR, Wade S, Goodnough T, Knight K, Dubois RW. Economic burden of anemia in an insured population. Journal of managed care pharmacy. 2005;11(7):565-74.
5. Haas JD, Brownlie IV T. Iron deficiency and reduced work capacity: a critical review of the research to determine a causal relationship. The Journal of nutrition. 2001;131(2):676S-90S.
6. Fatin A-S, Mamdooh G, Safaa Q, Nadiah B, Adel A. Prevalence of iron deficiency and iron deficiency anemia among females at university stage. Journal of Medical Laboratory and Diagnosis. 2011;2(1):5-11.
7. Halterman JS, Kaczorowski JM, Aligne CA, Auinger P, Szilagyi PG. Iron deficiency and cognitive achievement among school-aged children and adolescents in the United States. Pediatrics. 2001;107(6):1381-6.
8. Gari MA. Prevalence of iron deficiency anemia among female elementary school children in Northern Jeddah, Saudi Arabia. Journal of King Abdulaziz University-Medical Sciences. 2008;15(1):63-75.
9. Lozoff B, Jimenez E, Hagen J, Mollen E, Wolf AW. Poorer behavioral and developmental outcome more than 10 years after treatment for iron deficiency in infancy. Pediatrics. 2000;105(4):e51-e.
10. Bryant BJ, Yau YY, Arceo SM, Hopkins JA, Leitman SF. Ascertainment of iron deficiency and depletion in blood donors through screening questions for pica and restless legs syndrome. Transfusion. 2013;53(8):1637-44.
11. Cure P, Bembea M, Chou S, Doctor A, Eder A, Hendrickson J, et al. 2016 proceedings of the National Heart, Lung, and Blood Institute's scientific priorities in pediatric transfusion medicine. Transfusion. 2017;57(6):1568.
12. Krayenbuehl P-A, Battegay E, Breymann C, Furrer J, Schulthess G. Intravenous iron for the treatment of fatigue in nonanemic, premenopausal women with low serum ferritin concentration. Blood, The Journal of the American Society of Hematology. 2011;118(12):3222-7.
13. Stoltzfus RJ. Defining iron-deficiency anemia in public health terms: a time for reflection. The Journal of nutrition. 2001;131(2):565S-7S.
14. Strauss WE, Auerbach M. Health-related quality of life in patients with iron deficiency anemia: impact of treatment with intravenous iron. Patient related outcome measures. 2018:285-98.
15. Wick M, Pinggera W, Lehmann P, Wick M, Pinggera W, Lehmann P, editors. Eisenverteilungsstörungen—Diagnose und Therapie. Klinik und Labor Eisenstoffwechsel und Anämien: Neue Konzepte bei Renalen-und Tumoranämien und Rheumatoider Arthritis; 2002: Springer.
16. Breymann C, Römer T, Dudenhausen J. Treatment of iron deficiency in women. Geburtshilfe und Frauenheilkunde. 2013;73(03):256-61.
17. Fernandez-Jimenez MC, Moreno G, Wright I, Shih P-C, Vaquero MP, Remacha AF. Iron deficiency in menstruating adult women: Much more than anemia. Women's Health Reports. 2020;1(1):26-35.
18. Patterson AJ, Brown WJ, Roberts DC, Seldon MR. Dietary treatment of iron deficiency in women of childbearing age. The American journal of clinical nutrition. 2001;74(5):650-6.
19. Zhu X-Y, Wu T-T, Wang H-M, Li X, Ni L-Y, Chen T-J, et al. Correlates of nonanemic iron deficiency in restless legs syndrome. Frontiers in neurology. 2020;11:298.
20. Pavord S, Myers B, Robinson S, Allard S, Strong J, Oppenheimer C, et al. UK guidelines on the management of iron deficiency in pregnancy. British journal of haematology. 2012;156(5):588-600.
21. Sjöberg A, Hulthén L. Comparison of food habits, iron intake and iron status in adolescents before and after the withdrawal of the general iron fortification in Sweden. European journal of clinical nutrition. 2015;69(4):494-500.
22. Beard JL, Dawson H, Piñero DJ. Iron metabolism: a comprehensive review. Nutrition Reviews. 1996;54(10):295-317.
23. Macdougall IC. Strategies for iron supplementation: oral versus intravenous. Kidney International. 1999;55:S61-S6.
24. Bonnar J, Goldberg A, Smith J. Do pregnant women take their iron? The Lancet. 1969;293(7592):457-8.
25 Farid G, Warraich NF, Iftikhar S. Digital information security management policy in academic libraries: A systematic review (2010–2022). Journal of Information Science. 2023:01655515231160026.
26 Khalid A, Malik GF, Mahmood K. Sustainable development challenges in libraries: A systematic literature review (2000–2020). The Journal of academic librarianship. 2021 May 1;47(3):102347.