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THE EFFICACY OF INTRAVENOUS IRON SUCROSE IN WOMEN WITH ANAEMIA DURING PREGNANCY

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ABSTRACT

Background: The World Health Organization refers to this condition as anemia when hemoglobin is less than 11 gram/dl and hematocrit is less than 33. **It** is also known as the most common medical disorder in pregnancy. Anaemia is indirectly responsible for 40 percent to 50 percent of maternal deaths, especially in developing countries. All around the world, the most common cause of anaemia in pregnancy is a deficiency of iron. If anaemia is severe in pregnancy, there are poor maternal and fetal results. Preeclampsia, postpartum haemorrhage, preterm labor, sepsis, and an increase in the need for blood transfusion are some maternal effects.

Objective: The aim of this research is to identify the efficiency of intravenous iron sucrose in anaemic pregnant women.

Study design: A cross-sectional study

Place and Duration This study was conducted in Sandeman Provisional Hospital Quetta from March 2022 to March 2023

Methodology: All of the patients were aged between 20 years to 38 years. All of these participants were presented at the outpatient clinic with a singleton fetus and a gestational age of 26–34 weeks by checking through ultrasound. All of the participants were diagnosed with hypochromic microcytic anaemia, which was identified through blood examination. The target haemoglobin was 11g/dl. An intravenous injection was used to give iron sucrose on alternative days. Haemoglobin was repeated after 3 weeks of the last dose of intravenous iron.

Results: There were a total of 120 people selected for this research. A large number of participants were between 26 and 30 years old. The average age calculated was 32.3 years. A total of 60% of the cases were those whose gestational age was 31 to 34 weeks. At the end, the treatment was effective for 90 (75%) of the total participants.

Conclusion: The iron sucrose complex effectively elevated haemoglobin to an acceptable level in severely anaemic, iron-deficient pregnant women, demonstrating safety and good tolerance.

Keywords: pregnancy, iron deficiency anaemia, intravenous iron sucrose

INTRODUCTION

The World Health Organization [1] refers to this condition as anemia when hemoglobin is less than 11 grams/dl and hematocrit is less than 33. It is also known as the most common medical disorder in pregnancy. Anaemia is indirectly responsible for 40 percent to 50 percent of maternal deaths, especially in developing countries [2]. In well-developed countries, about 18 percent of females are affected by anemia. Moreover, in developing countries, about 35% to 75% of females are affected by anaemia [3]. All around the world, the most common cause of anaemia in pregnancy is the deficiency of iron [4]. It is reported by the World Health Organisation that women of fertile age are mostly affected by iron deficiency anaemia, representing a 50% proportion [5].

If anaemia is severe in pregnancy, there are poor maternal and fetal results. Preeclampsia, postpartum haemorrhage, preterm labor, sepsis, and an increase in the need for blood transfusion are some maternal effects [6]. An increase in the risk of preterm births, poor intrauterine growth, and low birth weight are directly linked with maternal anemia. The consequences of these are higher perinatal mortality and morbidity rates. When the haemoglobin is less than 8 g/dl, the perinatal mortality rate increases 2 to 3 times, and even the low birth weight newborn rate is doubled. There is a poor growth trajectory in infancy, childhood, and even adolescence, which is caused by low birth weight and intrauterine growth retardation. This also leads to low adult height.

The determinants of birth weight and intrauterine growth are maternal weight and parental height. In 80% of the patients, the target is to achieve a haemoglobin of 11 g/dl, which can be achieved by giving intravenous iron sucrose [7]. For iron-defined patients, erythropoiesis is used to incorporate intravenous iron into haemoglobin within three to four weeks [8]. Intravenous iron is effective as it has no serious adverse effects and restores iron more effectively and faster [9]. It is a very safe, effective, and convenient therapy to treat iron deficiency anaemia in pregnancy [10].

The current study aimed to identify the efficiency of intravenous iron sucrose in anaemic pregnant women.

METHODOLOGY

There were a total of 120 pregnant women included in this research who were selected according to the inclusion criteria. All of these patients were aged between 20 and 38 years. All of these participants were presented at the outpatient clinic with a singleton fetus and a gestational age of 26–34 weeks by checking through ultrasound. All of the participants were diagnosed with hypochromic microcytic anaemia, which was identified through blood examination.

Exclusion criteria: The women who were diagnosed with anaemia but had other causes such as megaloblastic anaemia or thalassemia were not a part of this research. Moreover, women with kidney, liver, or cardiovascular disease, having blood transfusions during pregnancy, or having a history of iron therapy were also excluded from this research.

The participants' demographic data, such as age, name, and gestational age, was gathered using a designed performa. All of the participants were properly explained about the purpose of this research, along with the side effects and benefits of the drug. The participants gave their informed written consent.

There was a formula used to calculate the iron deficit in each patient. The formula was: (Target hemoglobin% - actual hemoglobin% x weight in kg x 0.4 + 500. The result was rounded off to the nearest multiple of 100 mg. The target haemoglobin was 11g/dl. An intravenous injection was used to give iron sucrose on alternative days. Haemoglobin was repeated after 3 weeks of the last dose of intravenous iron.

SPSS version 22 was used to analyse the data. Mean and standard deviation were used for quantitative variables such as age. Frequency and percentages were used for qualitative variables such as the efficacy of drugs or economic class.

RESULTS

There were a total of 120 pregnant women selected for this research. A large number of participants were between 26 and 30 years old. The average age calculated was 32.3 years. Table number 1 shows the distribution of cases by age.

Table no. 1: distribution of cases by age

Age (Years)	N	%
20 to 25	14	11.6
26 to 30	58	48.4
31 to 35	36	30
36 to 38	12	10

Table number 2 shows the distribution of cases by gestational age.

Table no. 2: distribution of cases by gestational age

Gestational age (Weeks)	N	%
26 to 28	12	10
29 to 30	36	30
31 to 34	72	60

Table number 3 shows the comparison of hemoglobin levels before and after the treatment.

Table no. 3: comparison of hemoglobin levels before and after the treatment

Hemoglobin level (g/dl)	Standard deviation	Mean
Before treatment	1.2	8.7
After treatment	1.9	11.1

We calculated that 48 women, or 40% of the sample size, belonged to the lower socioeconomic status after distributing the cases according to economic status. Overall, 44 patients belonged to the middle socioeconomic status, and the remaining 28 participants were from the upper socioeconomic status. In the end, the treatment was effective for 90 (75%) of the total participants. However, it was ineffective for 30 participants.

DISCUSSION

In Pakistan, expectant mothers have a high prevalence of insufficient micronutrients, which may lead to malnutrition and retarded fetal growth within the uterus [11]. Anaemia is thought to affect almost two-thirds of pregnant women in underdeveloped countries, with iron deficiency accounting for 95% of anaemia cases during pregnancy. A low-iron diet, a series of pregnancies without iron supplementation, and regular menstrual bleeding are common contributing factors to iron deficiency anaemia before pregnancy [12, 13]. Many women enter pregnancy with iron levels that are low or completely depleted. As a result, the degree of anaemia is inversely related to the level of iron reserves. During pregnancy, there is an increased need for iron to maintain the growth of the mother's and foetus' red blood cell mass, as well as to address blood loss during birth [14].

Iron deficiency becomes more pronounced during pregnancy because the fetus can take the iron it requires from mothers who are already deficient. Furthermore, gastrointestinal disorders such as nausea, reflux esophagitis, motility problems, vomiting, and indigestion compound the difficulties of inadequate iron absorption during pregnancy [15, 16]. Anaemia is a major cause of maternal morbidity and mortality in developing countries.

Inadequate prenatal care, a lack of awareness of pregnant women's nutritional needs, and generally unfavourable socioeconomic circumstances are the root causes of this problem in our country [17].

Similarly, Asian countries such as Indonesia and India have a high prevalence of iron deficiency anaemia during pregnancy, which has a negative impact on both mothers and fetus [18]. Furthermore, this illness has been connected to an increased perinatal mortality rate in our region.

It is commonly accepted in industrialised nations that providing iron via intravenous supplementation is highly effective in treating iron-deficient anaemia in a variety of conditions, including pregnancy [19]. Strong data supports the conclusion that, when compared to oral iron, intravenous iron sucrose results in significantly faster recovery of iron-deficient anaemia with few side effects [20]. Furthermore, because it is administered intravenously, it overcomes compliance issues. Anaphylactic responses to iron sucrose are extremely infrequent, in contrast to intravenous dextran iron.

The most recent study shows that using intravenous iron sucrose for four weeks results in a significant increase in haemoglobin levels (P0.001). There were no notable adverse reactions observed, and none of the subjects received any unfavourable responses. Every participant stated that they were pleased with the treatment.

This shows that when anaemia severity worsens, the efficacy of iron sucrose treatment improves dramatically. This is because, if a tissue iron deficit is confirmed, serum transferrin receptor (TfR) content rises in direct proportion to the level of iron shortage. Our study found no notable adverse responses in any of the patients, which is consistent with the findings of multiple other studies.

CONCLUSION

The iron sucrose complex effectively elevated haemoglobin to an acceptable level in severely anaemic, iron-deficient pregnant women, demonstrating safety and good tolerance.

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