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Research Article

Prevalence and management of iron deficiency anemia in pregnancy in a tertiary care hospital over a period of 2 years

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Abstract:

Background and Objectives: Anemia in pregnancy is highly prevalent and can have a significant effect on both maternal and fetal outcome. The most prevalent kind of nutritional anemia that occurs during pregnancy is iron deficiency anemia. Even with the use of oral iron prevention during pregnancy, IDA remains a significant health concern for expectant mothers. The current study intends to examine the treatment response and prevalence of IDA in a pregnant population.

Methods: This is a retrospective cohort study looking into the prevalence of iron deficiency anaemia amongst pregnant women who delivered in a Tertiary care Hospital for a period of 2 years (Feb2022- Jan2024). All patients who got prenatal care at our hospital had their hemoglobin levels regularly evaluated at booking and at 28 weeks and 36 weeks pregnant and more often as needs by either a venous or capillary blood sample, are included in the inclusion criteria. We use the mid-trimester hemoglobin level to identify patients who are anemic among our study volunteers. SPSS was used for analysis.

Results- the prevalence of anemia was found to be 59.4% (N=297) mostly being Iron deficiency anemia. 6 patients were Thalassemia minor and 1 patient was Sickle cell carrier The most common age group was found to be 20-35 years in which 60.2% were anemic. Around 59% of anemic had tertiary form of education and parity 63% for 2-4. The most common category was mild anemia (82%), moderate in 15%. After 36 weeks the anemia levels were improved in all category only 12.4% had mild while no severe anemia was seen. But this was not statistically significant ($p>0.05$). The incidence of PPH were 2.7% in treated anemic patients while 1.7% in anemic

Conclusion: Anemia in Pregnancy is highly prevalent and if left untreated can have a significant effect on both Maternal and fetal outcome. Prevention, Health education on reproductive health from early childhood and Adolescent age is highly recommended.Eraly diagnosis and Prompt management of anaemia in Pregnant females by oral Iron or Iron infusion helps in a better outcome . Parenteral iron therapy should be used as soon as possible to enhance treatment outcomes. And also helps in avoiding the need for Blood transfusion.

Keywords: prevalence; Iron deficiency anemia; pregnancy; ferrous fumarate

Introduction

Anemia is the most common form of Nutritional deficiency worldwide.

Due to the growth of the mother's red blood cell mass, the increasing demand by the fetoplacental unit, and the necessity to prepare for blood loss during birth, pregnancy dramatically increases the need for iron. As a result, women who don't have enough iron in their body will be unable to meet these demands, resulting in an iron shortage that could cause anemia during pregnancy. [1,2] Due to its well-established correlation with preterm labor, low birth weight babies, inadequate iron storage in the baby, and mother's diminished cognitive function and reduced job capacity, and also increased risk of blood loss , post part hemorrhage , need for Blood transfusions ,this is a serious health concern. [3] It is estimated that iron deficiency anemia, the most common nutritional deficiency during pregnancy, affects 41.8% of pregnant women worldwide.[4]

Research has shown that anemia is very prevalent in United Arab Emirates. A cross sectional study showed a prevalence of 31 % and 26.7 % in women of reproductive age. Despite the availability of numerous treatment modalities, this proportion has remained relatively stable over the previous ten years or more. [4,5]. Thus, it is a significant public health concern. There is currently a lack of local epidemiological data on the prevalence of iron deficiency anemia during pregnancy, the results of treatment, and if the Ministry of Health's aim is being fulfilled. There is a dearth of information on the effectiveness of treatment for iron deficiency anemia, and the majority of studies mainly examined the prevalence and demographic characteristics linked to anemia in pregnancy. [5]

Dietary intake alone is insufficient to rectify an iron-deficient state, so oral iron supplementation is the main treatment for iron deficiency. Typically, a daily dosage of 100–200 mg of elemental iron is given [6]. When it comes to side effect worries, parenteral iron therapy is not the first choice. Parenteral iron is used when there has been a poor response to oral iron or when there is a problem with compliance because of the adverse effects of oral iron therapy. Research indicates that parenteral iron therapy outperforms oral therapy in terms of iron reserve replenishment and hemoglobin level grows more quickly. Given that anemia persists as a significant health concern throughout pregnancy, more has to be done to address this issue. The purpose of this study is to determine the prevalence of iron-deficiency anemia in the pregnant population and assess the efficacy of the treatment plans used to address the condition.

Materials and Methods

This is a retrospective cohort study looking into the prevalence of iron deficiency anaemia among pregnant women who delivered in Tertiary care Hospital between for a period of 2 years (Feb2022- Jan2024) .

All pregnant females who got prenatal care at our hospital and had their hemoglobin levels regularly evaluated at booking , and 28 weeks and at 36 weeks by either a venous or capillary blood sample are included in the inclusion criteria.

We use the mid-trimester hemoglobin level to identify patients who are anemic among our study volunteers. Anaemia is defined as hemoglobin concentration less than 11 g/dl. We further divide anemia into three categories: moderate (7-8.9 g/dl), severe (<7 g/dl), and mild (9-10.9 g/dl). A hypochromic microcytic image on a complete blood count (MVC <80 fl, MCH <27 pg) and, when available, a serum ferritin level of <30 ug/l are used to diagnose iron deficiency anemia (IDA) .

Our study included every postnatal mother who gave birth to a singleton child. Postpartum moms with antepartum hemorrhage-related anemia, underlying hemoglobinopathy, and non-singleton delivery were not included in the study. Ferrous fumarate 200 mg, which contains 65 mg of elemental iron and 5 mg of folic acid, was a frequently recommended iron supplement for every patient in this trial. It was recommended that patients who could not take ferrous fumarate take Haem Iron , folic acid and Vitamin B12 combination or Ferrous sulphate , ferrous Bisglycinate, Ferric Pyrophosphate. The dosage of oral iron is raised upon detection of iron deficient anemia.Parenteral iron, usually in the form of Iron Dextran is often provided to patients who exhibit inadequate adherence to oral therapy or who experience intolerable adverse effects. Iron sucrose was provided to patients who were allergic to iron dextran. Also Ferric Carboxymaltose infusion for a quicker recovery is given .Patients with severe anemia with symptomatic Hb levels less than 7 g/dL or those with moderate to severe anemia nearing their due date, where prompt correction is preferred, are eligible for blood transfusions.

Sample Size

The sample size of our study was estimated using the prevalence of anaemia in pregnancy reported as per NFHS-4 in 2019 (51%) [6]. Using the Cochrane formula, a sample size of 400 was calculated for this study. Data was collected from the patients' case records and included socio-demographic information (age, ethnicity, and education level), clinical risk factors (including parity and inter-pregnancy interval), clinical data of anemic status, types of treatment, and pregnancy outcomes.

Statistical Analysis

The collected data were entered into Statistical Package for Social Sciences (SPSS) Version 25 and examined. Whereas categorical variables were expressed as frequency and percentage, continuous variables were given as mean and standard deviation. The frequency, proportion, and mean of the data were reported. The use of the Chi-square Test was used to compare categorical data. The significance threshold was established at <0.05.

Results

	No anemia (N=203)		Anemia (N=297)			
	N	%	N	%		
Age group (year)						
<20	4	2	11	3.8	15	0.05
20 - 35	160	78.8	179	60.2	339	
>35	39	19.2	107	36	146	
Parity						
1	27	13	56	19	83	0.550
2-4	150	74	188	63	338	
≥5	26	13	53	18	79	
Pregnancy interval (years) (excluding primigravida)						
<2	51	25	86	29	137	0.366
2-4	125	62	154	52	279	
≥5	27	13	57	19	84	

Table 1: Demographic details and prevalence of Anemia in Pregnant females.

As per table 1 the prevalence of anemia was found to be 59.4% (N=297) and all being Iron deficiency anemia. The most common age group was found to be 20-35 years in which 60.2% were anemic. Around 59% of anemic had tertiary form of education and parity 63% for 2-4. The most common spacing

years were 2-4 years around 52% in anemic participants. But no parameters were significant.

	Mid-trimester		36 weeks	
	N	%	N	%
Mild (9-10.9)	244	82	37	29.8
Moderate (7-8.9)	45	15	2	1.6
Severe (<7)	8	3	0	0

Table 2: Outcome of Treatment in Iron Deficiency Anemia (N=297).

As per table 2 We use the mid-trimester hemoglobin level to identify patients who are anemic among our study volunteers but after 36 weeks the haemoglobin levels were also seen. The most common category was mild anemia (82%), moderate in 15%. After 36 weeks the anemia levels were improved in all category only 12.4% had mild while no severe anemia was seen. But this was not statistically significant (p>0.05).

	N	%	N	%	
Mode of delivery					
Vaginal	100	54	72	64	0.630
Caesarian	85	46	40	36	
Postpartum hemorrhage (PPH)					0.424
PPH	5	5.9	2	2.6	
No PPH	180	94.1	110	97.4	

Table 3: Incidence of PPH in IDA patients.

As per table 3 around 62% of study participants were treated with vaginal delivery was the most common mode of delivery among anemia vaginal delivery was still common but it was not significant. The incidence of PPH were 2.7% in treated anemic patients while 1.7% in anemic patients but it was not significant which suggest that other causes will be involved.

Discussion

In our study, we report the total prevalence of anemia as 59.4% (N=297), with iron deficiency anemias being the most common kind. The prevalence estimates are comparable to those of a previous local study that found that the overall prevalence of iron deficiency was 31.6% and anemia was 43.6%. [7] It is common knowledge that pregnant women require more iron than non-pregnant people do. 0.8 mg is the average daily requirement in the first trimester, 4-5 mg in the second, and 6-8 mg in the third trimester.

Pregnancy-related anemia affects both the mother and the fetus. Research document the following impacts on mothers: exhaustion, palpitations, dyspnea, elevated susceptibility to infections, psychological problems such emotional instability, depression, and stress, poor performance on cognitive tests, and a general decline in quality of life. [8] The most essential period of pregnancy is the early stages, and iron shortage during this period affects fetal brain development, which may not be able to be corrected by later intervention with iron supplements. [9] Even with adequate treatment, children between the ages of 4 and 10 in Chile had poorer memory, according to a research on the subject.

Eighty- two percent of the women in our research were diagnosed with mild anemia and started on oral iron therapy. 62% of the population (N=185) responds well to iron therapy overall. Anemia at the time of delivery decreased significantly from 82% of the mid-trimester to 29.8%. The majority of women who received parenteral iron had a success rate of 84.4%. These are the ladies who were started on parenteral iron therapy because they did not respond to oral iron. It is often known that serum ferritin, not hemoglobin level, is the most significant surrogate marker of iron deficient anemia.

The therapeutic dose for mild to moderate IDA (Hb 8.0-10.5 g/dl) in the first and second trimester anemia is 200 mg elemental iron per day. The Hb concentration should increase by 0.3-1.0 g/dl per week. Treatment should be continued until Hb has optimised and serum ferritin is improved and is above 30-50 µg.23.

However, the tolerance of iron deficiency anemia and its side effects that impair compliance provide a significant problem in its management. It is believed that just 49% of Malaysian pregnant women take their vitamins or supplements on a regular basis.25 Significant gastrointestinal side effects were observed by one meta-analysis that examined 17 randomized trials when oral iron was administered as opposed to parenterally. [10] Therefore, it is crucial to supply the right type and dosage to guarantee that iron stores are sufficiently restored. Numerous studies have been published, including systematic reviews and randomized controlled trials that compare the effects of oral and intravenous iron.

Every study has shown that intravenous iron replenishes iron reserves more effectively and corrects anemia more quickly and quickly. Following intravenous iron, there was a notable difference in the ferritin level, with iron

reserves only being restored in the intravenous group of women. [11] An increase in ferritin is thought to be connected to the iron sucrose complex, which releases iron to endogenous iron-binding proteins quickly and without causing any parenchymal tissue deposition. Iron sucrose has a half-life of around 5 to 6 hours and is readily available for erythropoiesis after being swiftly removed from serum. [12]

Studies have shown that poor neonatal outcomes, including low birthweight and preterm birth, are associated with anemia in mothers and fetuses. Risk of postpartum hemorrhage and placental abruption are among the maternal outcomes. Severe anemia is linked to unfavorable results for both the mother and the fetus, though. [11,12] Our results are comparable, showing no statistically significant correlation with the majority of our patients' moderate anemia and postpartum hemorrhage.

Our study has few limitations First, the observed relationships may have been distorted by the inability to quantify variables like iron supplementation and other dietary circumstances like compliance problems during pregnancy. This is mostly because the data are retroactive in nature. Furthermore, the results of our study cannot be broadly applied because we only included pregnant women who were seen in a single tertiary hospital.

Conclusions

Iron deficiency anemia in pregnancy is prevalent generally (59.4%), with the majority of cases being mild (9–11 g/dl). Oral iron raises hemoglobin in a manner similar to that of parenteral iron. Since oral iron is inexpensive and simple to take, efforts should be made to increase pregnant women's compliance by adopting forms and preparations that have the fewest adverse effects on the gastrointestinal tract. When it came to restocking iron stores, parental iron was superior to oral iron. This is crucial in low- and middle-income nations because, if their iron stores are not restored, lactating mothers can become anemic during the postpartum period.

When treating iron deficiency anemia, intravenous (IV) iron sucrose is said to be more effective and safe than traditional oral iron supplements. Our study's strength is its synthesis of the data supporting mainstreaming parenteral therapy as a workable solution for IDA. Randomized controlled trials (RCTs) conducted in a local setting are required to verify our findings so that policymakers can formulate recommendations.

Conflict of Interest: None declared

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