Assessment of Prescription and Intake of Iron Supplements among Pregnant Women who Attend Primary Healthcare Centers in Al-Mukalla District

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Abstract:

Background: Iron is essential for several physiological functions in the body. Anemia in pregnancy has many detrimental effects on maternal and child health.

Objective: The objective of this study is to evaluate patterns of iron supplement prescription and adherence among anemic pregnant women receiving antenatal care at primary health care centers in Al-Mukalla district, Yemen.

Methods: This was a descriptive cross-sectional study carried out in primary healthcare centers in Al-Mukalla district in 2020. The total sample size in this study was 380 of anemic pregnant women. Data was collected by using a validated, self-administered questionnaire.

Results: The most common age group among anemic pregnant women was 18 to 35 years (92.4%). Primary school was the most educational level of them (43.7%). Most pregnant women were housewife's (86.3%) and multigravida (68.9%). Ferrous fumerete is the most commonly iron supplement received by pregnant women (75.30%). The most frequently prescribed dose of iron supplements ranged from 30 to 60 mg/day (65.5%) for less than three months (87.9%). Water is the most commonly dinking type that pregnant women take with iron supplements (91.1%).

Conclusion: This study revealed that iron was used with an appropriate dose but with inappropriate duration. Most of pregnant women were used iron with water. Ferrous fumerete is the most commonly used type of iron supplements.

Keywords: Prescription, intake iron supplement, iron deficiency anemia, pregnant women.

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تقييم وصفات مكملات الحديد وتناولها بين النساء الحوامل المراجعين للمراكز الصحية الأولية في مديرية المكلا

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الملخص:

الخلفية: يعتبر الحديد عنصر هام في كثير من الوظائف الفسيولوجية في الجسم, و يؤدي فقر الدم أثناء الحمل إلى آثار ضارة على صحة الأم والطفل. و تشكل نسبة فقر الدم عند النساء الحوامل حوالي 38.2% عالميا حسب إعلان منظمة الصحة العالمية.

الهدف: هو تقييم وصفات مكملات الحديد وتناولها بين النساء الحوامل.

الطريقة: تم استخدام دراسة مقطعية لتقييم وصفة ومقدار تناول مكملات الحديد بين النساء الحوامل القادمات إلى مراكز الرعاية الصحية الأولية في مديرية المكلا بمحافظة حضرموت و المصابات بفقر الدم. و قد أجريت الدراسة على 380 امرأة حامل مصابة بفقر الدم في الفترة من 5 يناير إلى 29 فبراير 2020.

النتائج: تراوحت الفئة العمرية الأكثر شيوعًا بين 18 و 35 عامًا (92.4٪). و كان المستوى الابتدائي أعلى مستوى تعليمي للنساء الحوامل المشاركات في هذه الدراسة (43.7%). كانت معظم النساء الحوامل ربات منزل (86.3%) ومتعددات الحمل (68.9%). الفوميرات الحديدية هي أكثر أنواع مكملات الحديد استخدامًا والتي تتلقاها النساء الحوامل (75.30%). تراوحت الجرعة الأكثر شيوعًا من مكملات الحديد الموصوفة من 30 إلى 60 مجم في اليوم (65.5%) و لكن لمدة تقل عن ثلاثة أشهر (87.9%). و يعتبر الماء هو النوع الأكثر شيوعًا من السوائل التي تتناولها النساء الحوامل مع مكملات الحديد (91.1%).

الخلاصة: أظهرت هذه الدراسة أن الحديد تم استخدامه بجرعة مناسبة ولكن بمده غير مناسبة ،الفوميرات الحديدية هو النوع الأكثر استخداما من مكملات الحديد. معظم النساء الحوامل استخدمن الحديد مع الماء .

الكلمات المفتاحية: وصفة طبية، تناول مكمل الحديد، فقر الدم الناتج عن نقص الحديد، النساء الحوامل.

Introduction:

During pregnancy, maintaining a balanced diet with adequate intake of essential nutrients is crucial not only for optimal fetal development and favorable birth outcomes but also for maternal health. Among the micronutrients of particular significance, iron plays a vital role in several physiological processes (1). It is essential for oxygen transport by red blood cells, energy metabolism, growth, and development (2,3). Additionally, iron supports cellular immune responses, mitochondrial oxidative metabolism, and the synthesis of hemoglobin and myoglobin (3). When iron losses surpass the body's iron reserves, stores become depleted, leading to impaired hemoglobin synthesis and a reduction in the hemoglobin content of red blood cells (4)

Iron absorption from supplements is influenced by the individual's baseline iron status as well as the concurrent intake of dietary factors that either enhance or inhibit absorption. For instance, vitamin C enhances iron bioavailability, whereas substances such as calcium, phytates found in cereals like wheat and rice, and tannins present in tea can significantly reduce its absorption (5). During pregnancy, the demand for iron progressively increases to support both maternal and fetal requirements, peaking in the third trimester (6). Prolonged imbalances due to insufficient dietary intake, poor absorption, or chronic blood loss further elevate the need for iron supply (7). Consequently, iron deficiency is the leading cause of anemia during pregnancy (8). Iron deficiency anemia is defined as a condition in which the oxygen-carrying capacity of the blood is inadequate to meet the physiological demands of body tissues (7).

The World Health Organization defines pregnancy anemia as a hematocrit level below 33% or a hemoglobin (Hb) concentration less than 11 g/dL at any point during gestation (9). To prevent maternal anemia, low birth weight, and preterm birth, the WHO recommends daily oral iron supplementation of 30–60 mg for at least three months during pregnancy (10).

Iron is typically administered in the form of salt compounds, available as tablets, capsules, liquids, or dispersible formulations. The most commonly prescribed iron salts include ferrous sulfate, ferrous fumarate, and ferrous gluconate (5). Oral iron supplementation remains the first-line treatment for pregnant women with mild-to-moderate anemia. In contrast, parenteral iron formulations are recommended as alternative therapeutic options for women who do not respond adequately to oral therapy or require a more rapid correction of hemoglobin (Hb) levels (11). However, parenteral administration is associated with local adverse effects such as pain and erythema at the injection site, and in rare cases, may lead to anaphylactic reactions. Although newer low-molecular-weight iron preparations are associated with a lower risk of severe hypersensitivity reactions, they are considerably more expensive than oral iron therapy and lack the convenience and safety profile of the latter (12).

Globally, 38.2% of pregnant women are affected by anemia according to WHO report (13). The prevalence of anemia among Pakistani pregnant women is higher with 51% (8) while the prevalence of anemia in Uganda is about 33% (14).

The prevalence of anemia in Yemen was (83.4%) among pregnant women, and the most common type of anemia was IDA (15).

In a study conducted at Al- Mukalla district in Hadhramout governorate at 2004, the results showed that 37.5% of the healthy non-pregnant women were anemic, of these 73% had iron deficiency anemia (15).

The aim of this study is to assess the prescription and intake of iron supplements among anemic pregnant women attending primary health care centers in Al-Mukalla district.

Materials and methods:

This was a descriptive cross-sectional study conducted in primary healthcare centers in Al-Mukalla district, the capital city of Hadhramout governorate located in the southern part of the Arabian Peninsula along the coast of the Arabian Sea. Data collection took place over a two-month period, from January 1, 2020, to February 29, 2020. The study included a total of 380 pregnant women who attended primary healthcare centers in Al-Mukalla during the study period and had been diagnosed with iron deficiency anemia (IDA). A multistage random sampling technique was employed to determine the sample size.

The purpose of the study was explained to all participants, and informed verbal consent was obtained prior to data collection. Information was gathered using a validated, self-administered questionnaire developed by the researchers to align with the study objectives.

Collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 20. Descriptive statistics, including frequencies and percentages, were used to summarize the data and explore univariate distributions.

Results:

Among the 380 pregnant women, the most common age group was ranged from 18 to 35 years (92.4%), 10.5% of the interviewed participants were illiterate, whereas the rest were educated as following; (43.7%) primary school, (33.2%) secondary school, and about (12.6%) were finished university level. Regarding occupation of the participants, the great majority (86.3%) of them were housewives, about (4.2%) were still students, whereas (6.1%) were workers in non-health fields, and only (3.4%) were workers in health fields. Most of the participants were multigravida (68.9%), while (31.1%) were primigravida (Table 1).

Table 1: **General characteristics of study population (N=380).**

Demographic data	Characteristics	Frequency (N)	%
Age (years)	< 18	10	2.6%
	18-35	351	92.4%
	> 35	19	5%
Level of education	Illiterate	40	10.5%
	Primary school	166	43.7%
	Secondary school	126	33.2%
	University	48	12.6%
Occupation	Housewife	328	86.3 %
	Work in health field	13	3.4 %
	Work in non- health field	23	6.1 %
	Student	16	4.2 %
Gravida	Primigravida	118	31.1 %
	Multigravida	262	68.9 %

The distribution of most common types of iron supplements among anemic pregnant women was shown in (Figure 1). Ferrous fummerate was the most commonly used type of iron supplements which represent 75.30%, while iron polymaltose was the least one with a percentage of 1.10%.

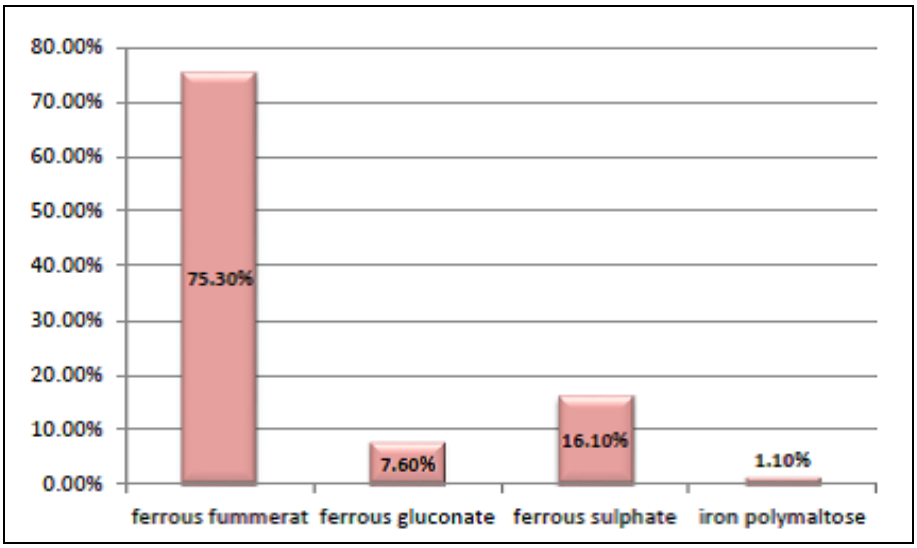

Figure 1: Distribution of the most commonly used types of iron supplements among pregnant women

The most frequently prescribed dose of iron supplements were ranged from 30 to 60 mg/day (65.5%). The duration of iron supplements intake revealed that it was commonly lasts less than the recommended three months (87.9%) while just 10% used it for three months. Regarding the dosage form of iron supplements prescribed to the participants were; tablet (54.5%), capsule (38.9%), syrup (6.1%) and injection (0.5%) respectively (Table 2).

Table 2: **Prescription of iron supplement for anemic pregnant women**

Variables		Frequency	Percentage
Dose	< 30 mg/day	9	2.4%
	30-60 mg/day	249	65.5%
	> 60 mg/day	122	32.1%
Duration	< 3months	334	87.9%
	3 months	38	10%
	> 3 months	8	2.1%
Dosage form	Tablet	207	54.5%
	Capsule	148	38.9%
	Syrup	23	6.1%
	Injection	2	0.5%

Of the 380 participants, 91.1% of them took iron supplements with water, while 5.8% took it with juice and just 3.2% of them took it with milk (Figure 2).

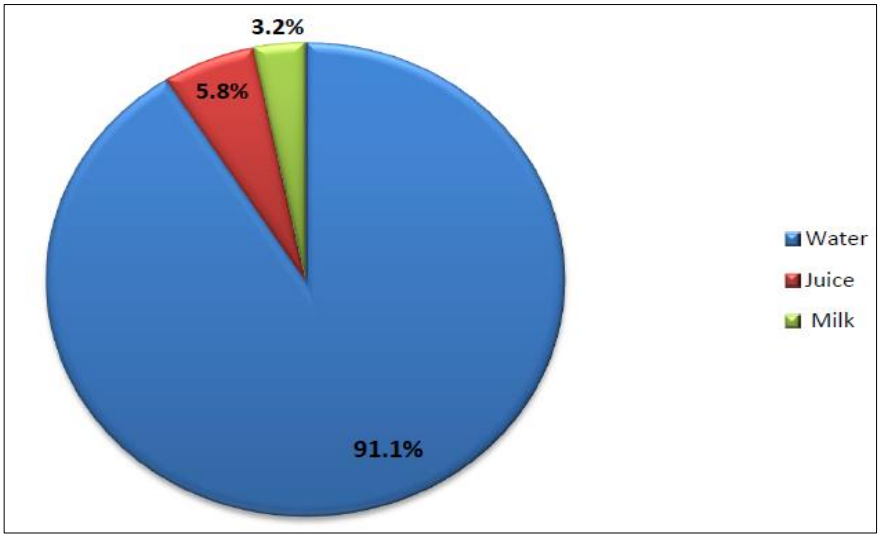

Figure 2: **Distribution of drinking fluid that were taken with iron supplements.**

Discussion:

Iron deficiency is the leading cause of anemia during pregnancy and represents the most prevalent nutritional deficiency worldwide. Studies have shown that pregnancy-related anemia is associated with an elevated risk of maternal mortality (1).

Among the 380 participants, 92.4% were adult, at age group (18-35) years. This findings is comparable to a study done in Ethiopia with proportion of 74.9% (16). In our study, most of participants (43.7%) had attained primary school education. However, in Ethiopia, a higher proportion of the participants were 67.3% illiterate (16), while in Kenya most of the participants (40.93%) had a secondary level of education (17).

This study found that 86.3% of the participants were housewives, which is notably higher than the 56.9% reported in a similar study in Tanzania (16), yet comparable to the results observed in a study conducted in India (6).

The findings of the present study found that most of the participants under study were multigravida (68.9 %), and this finding was similar to a study done in India (66.17%), Kenya (66.76%), Germany (68.5%) and Malaysia (70.0%) respectively (19,17,1,18).

This study showed that ferrous fumarate was the most prescribed type of iron supplement (75.30%), whereas findings from Germany indicate that ferrous sulphate remains the most commonly prescribed iron formulation for pregnant women, accounting for 74.1% of prescriptions (1). However, in India, ferrous sulfate (90.4%) and iron sucrose (98.53%) were reported as the most commonly prescribed oral and parenteral iron formulations, respectively (19).

This variation in the type of the drugs may be related to the high availability of the ferrous fumarate in our primary health care center, while ferrous sulphate is not.

The most frequently prescribed dose of iron supplements in our study was ranged from 30 to 60 mg/day (65.5%). This findings is comparable to a study done in Germany which reported that (67.5%) of pregnant women had supplemented an iron dose of equal to 60 mg (1), while in a study conducted in Danish (84.8%) of pregnant women used dose of 60 mg per day (20).

In our study we found that the duration of intake of iron supplements was less than the recommended duration of three months in (87.9%) of participants. This finding is nearly similar to a study done in Uganda, where about (83.2%) of the anemic pregnant women used iron supplements for less than three months (14), while high proportion in Northwest Ethiopia (91.6%) and Southern Senegal (74.1%) used it for 3 months respectively (21,22). About the dosage form of iron supplements in the present study, tablet was the most common used form (54.5%). This is similar to many studies done in India (53.42%) Kenia (56.13%) and Indonesia (56.66%) (6,17,23).

The present study showed that most of the participants were consuming iron supplements with water (91.1%), although iron is better absorbed with juice rich in vitamin C. This finding is higher than that reported in a study conducted in India (55.65%) (6), but is comparable to findings from studies carried out in Eastern Indonesia (100%) and Oman (80.95%) (23,9).

Conclusion:

The current study revealed that iron supplements were used with an appropriate dose but with inappropriate duration in anemic pregnant women. Ferrous fumerete was the most common type of iron supplements used by the pregnant women, and taken as tablet form. Also most of the participants were used iron with water.

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