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ANALYSIS OF DAILY IRON SUPPLEMENT (GREATER INCREASE IN RED BLOOD CELL VOLUME) WITH COMPARISON OF INTERMITTENT IRON IN IRON DEFICIENCY ANEMIA

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Abstract:

Introduction: *Anaemia is a condition in which the number of red blood cells is insufficient to meet physiologic needs; it is caused by many conditions, particularly iron deficiency.*

Aims and objectives: *The basic aim of the study is to analyse the daily iron supplement (greater increase in red blood cell volume) with comparison of intermittent iron in iron deficiency anemia.*

Material and methods: *This descriptive study was conducted in King Edward Medical University, Lahore during January 2019 to July 2019 with the permission of ethical committee of hospital. . Data were collected from 100 pregnant female patients. Participants were selected through randomly sampling technique.*

Results: *The data was collected from 100 female patients. The only factors which emerged as statistically significant from the adjusted logistic regression analysis model were insufficient intakes of iron (OR = 7.39; 95% CI: 1.45-37.57) and vitamin C (OR = 6.14; 95% CI: 1.34-28.27), frequent (≥2 times per week) tea consumption (OR = 0.01; 95% CI: 0.01-0.08), infrequent (≤2 times per week) red meat consumption (OR = 3.71; 95% CI: 1.01-13.61), and the possession of a personal history of IDA (OR = 6.00; 95% CI: 1.45-24.76).*

Conclusion: *It is concluded that main risk factors in relation to contracting anemia were inadequate intakes of iron and vitamin C, frequent tea consumption, infrequent red meat consumption, and a past personal history of IDA.*

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INTRODUCTION:

Anaemia is a condition in which the number of red blood cells is insufficient to meet physiologic needs; it is caused by many conditions, particularly iron deficiency. Traditionally, daily iron supplementation has been a standard practice for preventing and treating anaemia. However, its long-term use has been limited, as it has been associated with adverse side effects such as nausea, constipation, and teeth staining [1]. Intermittent iron supplementation has been suggested as an effective and safer alternative to daily iron supplementation for preventing and reducing anaemia at the population level, especially in areas where this condition is highly prevalent [2].

Anemia, as defined by low hemoglobin or hematocrit, is commonly used to assess the severity of iron deficiency in populations without high rates of malaria. The high physiological requirement for iron in pregnancy is difficult to meet with most diets. Therefore, pregnant women should routinely receive iron supplementation, especially in developing countries. Prenatal iron supplementation is not compulsory in many industrialized countries and the recommended dose is usually small (30 mg ferrous iron daily) [3]. However, for developing countries, the recommendation is a daily dose of 60 mg of iron for pregnant, non-anemic women for six months and an increased dose of 120 mg of iron daily if the duration of supplementation is shorter, if iron deficiency prevalence in women of a given country is high, and if pregnant women are anemic. This supplement should include 400 µg of folic acid or lower doses if this amount is not available [4].

Earlier studies have provided sufficient evidence to show that iron supplementation with or without folic acid results in a significant reduction in the incidence of anemia during pregnancy [5]. There has also been a limited impact of iron supplementation in community settings owing to lack of compliance and poor infrastructure. However, data regarding quality of evidence for the effectiveness of iron during pregnancy are lacking. Besides, the data on studies in developing countries have not been presented separately [6].

Aims and objectives:

The basic aim of the study is to analyse the daily iron supplement (greater increase in red blood cell volume) with comparison of intermittent iron in iron deficiency anemia.

Material and methods:

This descriptive study was conducted in King Edward Medical University, Lahore during January 2019 to July 2019 with the permission of ethical committee of hospital. . Data were collected from 100 female patients. Participants were selected through randomly sampling technique.

Data collection:

All the data were collected through a questionnaire. The data was divided into two groups, one was control group and one was selected patients. We compare the selected patients with control group. A detailed sociodemographic data form was given to all subjects. Pregnancy characteristics, age, medication history, tobacco and alcohol use, and educational and familial status were recorded.

Statistical analysis:

The data was collected and analysed using SPSS version 21.0. Student's t-test was used to compare the data that was normally distributed. Data non-normally distributed were compared using the Mann–Whitney U test.

RESULTS:

The data was collected from 100 female patients. The only factors which emerged as statistically significant from the adjusted logistic regression analysis model were insufficient intakes of iron (OR = 7.39; 95% CI: 1.45-37.57) and vitamin C (OR = 6.14; 95% CI: 1.34-28.27), frequent (≥2 times per week) tea consumption (OR = 0.01; 95% CI: 0.01-0.08), infrequent (≤2 times per week) red meat consumption (OR = 3.71; 95% CI: 1.01-13.61), and the possession of a personal history of IDA (OR = 6.00; 95% CI: 1.45-24.76).

Table 01: Multivariate logistic regression analysis of the factors associated with iron deficiency anemia among the study sample of female

Variables	**Adjusted OR (95% CI)**
Intake of iron	
< Recommended intake	7.39 (1.45-37.57)
≥ Recommended intake	1 (Ref.)
Intake of vitamin C	
< Recommended intake	6.14 (1.34-28.27)
≥ Recommended intake	1 (Ref.)
Frequency of tea consumption	
≤2 times a week	0.01 (0.01-0.08)
≥3 times a week	1 (Ref.)
Frequency of red meat consumption	
≤2 times a week	3.71 (1.01-13.61)
≥3 times a week	1 (Ref.)
Blood clotting during menstruation	
Yes	1.66 (0.42-6.47)
No	1 (Ref.)
Past personal history of iron deficiency anemia	
Yes	6.00 (1.45-24.76)
No	1 (Ref.)
Past family history of iron deficiency anemia	
Yes	1.04 (0.26-4.17)
No	1 (Ref.)

DISCUSSION:

This demographic group (ie, women of childbearing age) is at a heightened risk of deficiency in comparison with the general population due to their greater nutritional needs for the maintenance of their metabolic stores and because of their potentially high nutritional demands due to menstrual blood loss, pregnancy, and/or lactation [7].

The study observed an overall IDA prevalence of 12.5%, a significantly lower rate than that found by a prior study among a sample of female Saudi university students, which reported a prevalence of IDA of 64% (defined as hemoglobin <12 g/dL). In developing countries, the overall prevalence of anemia has been estimated at 43%, but in highly developed countries, it has been reported at a far lower level of 9%.To take an example, research in an Indian setting reported a prevalence of 44.0% among female university students, and widespread IDA has also been found among female students in other developing countries such as Bangladesh, where 63.3% of a female student sample was found to have IDA [8]. In contrast, in Australia, a developed country, only a 3% prevalence of IDA was found by a study using a sample of female university students.

This research has found that most of the female students in the study sample who were anemic reported inadequate intakes of iron, along with a lower level of consumption (≤2 times per week) of red meat [9]. These 2 factors were found to be associated with a statistically significant increased risk of IDA. In the human diet, iron exists either in the form of heme or nonheme iron; the former is mostly consumed via meat, with a rate of absorption of up to 50%, whereas the latter is mainly found in dairy products, fruit, and vegetables, and its variable level of absorption depends on the enhancers and inhibitors present. Red meat is a key source of bioavailable heme iron in human diets, and various prior studies have identified a negative association between low levels of red meat consumption and a heightened risk of IDA [10].

CONCLUSION:

It is concluded that main risk factors in relation to contracting anemia were inadequate intakes of iron and vitamin C, frequent tea consumption, infrequent red meat consumption, and a past personal history of IDA. The findings presented here suggest a need for focused education and awareness strategies designed to improve nutritional habits by encouraging the consumption of rich sources of iron in the diet (eg, red meat), as well as by building understanding of which food and beverages can improve (eg, vitamin C–rich

foods) and hinder (eg, polyphenol-rich beverages, such as tea) iron bioavailability.

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