

Frequency of Tea Consumption among Iron Deficient Pregnant Women

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ABSTRACT

Anemia in pregnancy is a fundamental problem that affects not only the life of the mother, but also the life of the child. Iron deficiency has become one of the most important public health problems, and its prevalence is rising in both developing and developed countries.

Objective: To determine the frequency of tea consumption by pregnant women with iron deficiency.

Study Design: A Cross-sectional study.

Place and Duration: The study was held in the Department of Obstetrics and Gynecology of the Aga Khan University Hospital (AKUH), Karachi for six months from 26th October 2020 to 26th April 2021.

Methods: Data were collected prospectively after oral consent was obtained from the patients. 145 patients meeting the inclusion criteria were included in the study. Simple descriptive statistics like mean and standard deviation are used to depict quantitative data, whereas frequency and percentage are used to represent qualitative characteristics. To examine the impact of effect modifiers on the outcome variable, stratification was done. A chi-square test was employed after stratification, and a p value of <0.05 was deemed significant.

Results: A total of 145 pregnant patients were enrolled in the study. In our study, the mean age and gestational age were 32.26±8.74 years and 18.45±4.22 weeks. 912 (63.24%) and 53 (36.86%) of 145 pregnant women with iron deficiency anemia consumed tea and did not drink it.

Conclusion: This study suggests that tea consumption is quite common in our society and plays an important role in iron deficiency anemia. In light of the test results, prompt identification and treatment are recommended.

Keywords: Pregnancy, Iron deficiency anemia, Tannin levels and Tea consumption.

INTRODUCTION

One of the most widespread disorders caused by nutritional deficiencies is anaemia. Despite the fact that nutritional anaemia can affect people of both sexes at any age, it is more prevalent in women and is linked to low birth weight, maternal morbidity, and mortality¹⁻². In under-developed states, nutritional anaemia is supposed to affect around 2/3rd of pregnant females³. According to various studies, chronic anaemia affects 27% of married females in Pakistan between the 15-44 years of ages in urban areas and 48% in rural regions⁴.

Anemia during pregnancy has a complex cause that differs geographically in developing nations. The primary causes are increased menstrual bleeding brought on by foetal physiological demands and maternal blood volume during pregnancy, iron insufficiency related to low food intake, malabsorption of dietary iron, and inadequate iron absorption⁵⁻⁶. The suggested iron dosage during gestation is augmented by 9 mg to a total of 27 mg/day in order to protect maternal storage and prevent the onset of iron deficiency⁷. When considering dietary habits, it is important to keep in mind that consuming tea has unfavourable effects on iron stores while consuming red meat more than twice a week has protective benefits⁸⁻⁹. In Pakistan, tea is one of the most popular beverages. Pakistani culture is centred around drinking tea. It is among the most popular drinks in the nation. The phenolic substances that prevent iron absorption can be found in tea, coffee, red wine, some green vegetables, almonds, and legumes. Since tea does not affect heme iron relatively, drinking tea mainly affects the absorption of non-heme iron¹⁰⁻¹¹. Pakistani society loves tea, and where low socioeconomic women have marginal iron stores before pregnancy, they typically experience nutritional deficiencies that put them at high risk of anemia. The novelty of this study will be to establish a link between tea consumption during pregnancy and iron deficiency anemia¹². If this study links tea consumption to iron deficiency anemia, the results will be shared with other healthcare professionals and help us raise awareness of the potential risks of tea consumption among healthcare professionals and pregnant women. This will help us formulate local guidelines for better prenatal care and positive postnatal outcome. After a thorough search of the literature, no local studies on the subject were found. This is a strong reason to conduct a study.

METHODS

This cross-sectional study was conducted in the Obstetrics and Gynecology Department of Aga Khan University Hospital (AKUH) Karachi for six months duration from 26th October 2020 to 26th April 2021 after approval from the ethical committee. 145 patients meeting the inclusion criteria were included in the study using a non-probability consecutive sampling technique. The frequency of tea drinking by pregnant women with iron deficiency anemia was 10.53.3%, confidence level C.I = 95% and margin of error = 5%. The WHO software was used to calculate the sample size.

Inclusion Criteria:

- Age range 20-40 years
- Parity ≥ 1.
- Gestational age ≥ 4 weeks.
- All pregnant women with iron deficiency anemia as per the operational definition who presented to the maternity clinic for prenatal care or were admitted to the service.

Exclusion Criteria:

- Patients who do not wish to be included in the study.
- Any blood clotting disorder such as thalassemia, hemophilia, von Brand's disease.

Data Collection Procedure: The study was approved by the hospital ethical committee. The CPSP trainee obtained the patient's informed consent. Demographic information, comorbidities, gestational age in the trimester, pre-pregnancy hemoglobin levels, and all relevant laboratory tests (complete blood counts) of the patients were recorded. Confounding factors such as bleeding disorders were excluded from the study to avoid bias in the study results. Patients were directly asked about the duration, type and amount of tea consumed per standard cup size. All demographic information was entered into a pre-designed data collection form. Pregnant women were shown due respect.

Data was calculated and analyzed using SPSS version 17.0. The standard deviation and mean of the continuous variable were calculated for iron deficiency anemia, pregnancy, parity, history of abortion, diet (vegetables, meat), place of residence, education, comorbidities (diabetes, hypertension) and smoking. Impact modifiers such as age, parity, diet, place of residence, comorbidities, education, and smoking were controlled by stratification. After stratification, the chi-square test was used and $P \leq 0.05$ was considered significant.

RESULTS

A total of 145 pregnant patients who reported to the Department of Gynecology and Obstetrics were studied. The lowest age of the 147 patients was 20 years and the maximum age was 40 years. In our study, the mean age and gestational age were 32.26±8.74 years and 18.45±4.22 weeks, respectively. As shown in table 1.

Table-1: Shows The Descriptive Statistics, n=145

Variable	Mean ± SD	Standard Deviation	Min-max
Age (years)	32.26	±8.74	20-40
Gestational age (weeks)	18.45	±4.22	4-30

912 (63.24%) and 53 (36.86%) of 145 pregnant women with iron deficiency anemia consumed tea and did not drink it. As shown in Figure 1.

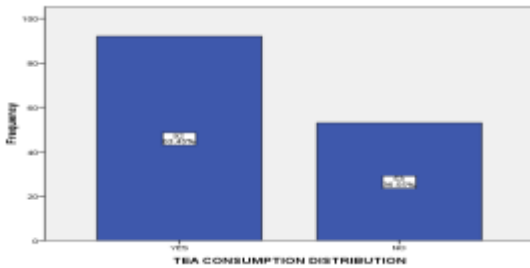


Figure-1 Shows The Tea Consumption Distribution, n=145

The frequency distribution of tea consumption exhibited that 44 (30.3%), 48 (33.1%) and 53 (36.6%), respectively, of 145 pregnant women with iron deficiency anemia consumed little tea. As shown in Figure 2.

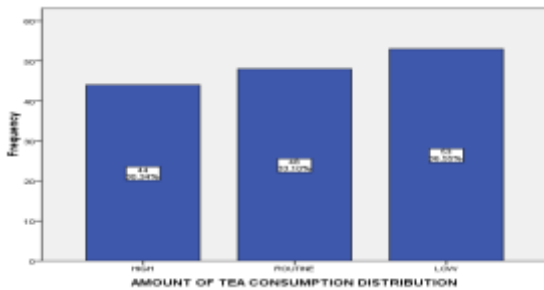


Figure-2: Shows the Amount of Tea Consumption Distribution, n=145

Pregnancy rates showed gravida <3 and >3 in 48 (33.1%) and 97 (66.9%) of the 145 pregnant women with iron deficiency anemia, respectively. As shown in Figure 3.

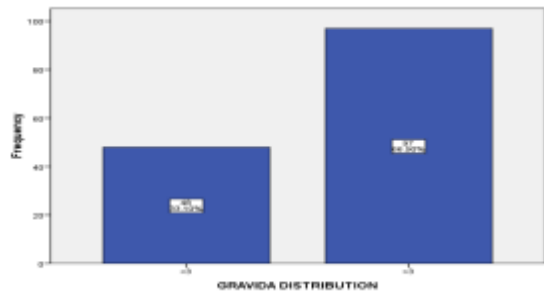


Figure-3: Shows The Gravida Distribution, n=145

The frequency distribution of meat consumption showed that 104 (71.7%) and 41 (28.3%) of 145 pregnant women with iron

deficiency anemia had a history of meat consumption and never had. As shown in Figure 4.

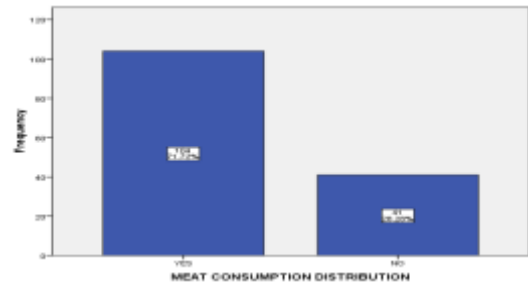


Figure-4: Shows The Meat Consumption Distribution, n=145

The frequency distribution of type II diabetes showed that 14 (9.7%) and 131 (90.3%), respectively, of the 145 pregnant patients with iron deficiency anemia had type II diabetes or not. As shown in Figure 5.

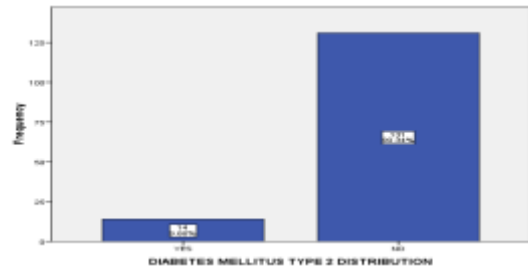


Figure-5: Diabetes Mellitus Type II Distribution, n=145

Tea consumption age classification showed that 47 (51.1%) patients in the 20-30 age group and 45 (48.9%) patients in the 31-40 age group consumed tea. On the other hand, 25 (47.2%) patients aged 20-30 and 28 (52.8%) patients aged 31-40 did not consume tea. the p-value was 0.38. As shown in table 2.

Stratification of tea consumption by locality showed that 84 (91.3%) urban residents consumed tea and 51 (96.2%) did not drink tea. Tea was drunk by 08 (8.7%) of rural residents, while 02 (3.8%) did not drink tea and the p-value was 0.22. As shown in table 2.

Table-2: Shows The Tea Consumption According To Residence Status, n=145

Residence	Tea consumption		Total
	Yes	No	
Urban	84 (91.3%)	51 (96.2%)	135 (93.1%)
Rural	08 (8.7%)	02 (3.8%)	10 (66.9%)
Total	92 (100%)	53 (100%)	145 (100%)
P-value	0.22		

Table-3: Shows The Tea Consumption According To Hypertension, n=145

Hypertension	Tea consumption		Total
	Yes	No	
Yes	11 (12%)	04 (7.5%)	15 (10.3%)
No	81 (88%)	49 (92.5%)	130 (89.7%)
Total	92 (100%)	53 (100%)	145 (100%)
P-value	0.29		

Classification of hypertension by tea consumption showed that 11 (12%) of the hypertensives consumed tea and 04 (7.5%) did not drink tea. While 81 (88%) of the non-hypertensives

consumed tea, 49 (92.5%) did not drink tea, P=0.29. As shown in table 3.

Stratification of tea consumption by education level showed that illiterate people consumed 03 (3.3%) and 00 (00%) tea, respectively. While 01 (1.1%) of primary school graduates drink tea, 02 (3.8%) do not drink tea. Moreover, while 33 (35.9%) of high school graduates drank tea, 15 (28.3%) did not drink it. Finally, 55 (59.8%) of high school graduates drank tea, and 36 (67.9%) did not drink it. the p-value was 0.27. As shown in table 4.

Table-4: Shows The Tea Consumption According To Educational Status, n=145

Educational status	Tea consumption		Total
	Yes	No	
Illiterate	03 (3.3%)	00 (00%)	03 (2.1%)
Primary	01 (1.1%)	02 (3.8%)	03 (2.1%)
Secondary	33 (35.9%)	15 (28.3%)	48 (33.1%)
Higher	55 (59.8%)	36 (67.9%)	91 (62.8%)
Total	92 (100%)	53 (100%)	145 (100%)
P-value	0.27		

DISCUSSION

Anemia caused by a lack of iron is a frequent condition globally. This is typically caused by poor dietary iron intake or malabsorption as well as persistent blood loss. The diagnosis is based on detailed observation of the patient's behavior, such as coercing himself to consume an innutritious drug, in addition to symptom assessment and laboratory tests (pica)¹³. On the other hand, eating a lot of typical foods or beverages that include chemicals that hinder iron absorption can be disregarded as a contributing factor to an iron shortage¹⁴. Our study included 145 pregnant patients in total. The mean age and gestational age in our sample were 32.26 + 8.74 years and 18.45 + 4.22 weeks, respectively. Of the 145 pregnant women with iron deficiency anemia, 912 (63.24%) and 53 (36.86%) drank tea, respectively. In one study, the final analysis included 94 pregnant women. The study removed two participants who never drank tea and six participants who drank leaf tea instead of teabags. Due to health issues, the other two individuals were unable to take part in the interview. According to the findings, factors that could indicate the presence of iron deficiency anemia were the length of time since the last pregnancy (2 years), the number of births (more than two), a lower intake of heme-containing foods, and tannin intake (low, moderate, or high). The findings revealed that serum ferritin levels and tannin levels were correlated inversely. Serum levels of ferritin were highest in gravid females who drank low tannin tea, whereas they were lowest in those who drank high and medium tannin tea.

Numerous studies have demonstrated that iron deficiency anemia in pregnant women is strongly associated with childbirth¹⁵. A study conducted in Oman found that the high parity group had a hazard ratio of 3.8 (CI of 95% confidence interval = 3.70-5.10) compared to the low parity groups¹⁶. According to the multivariate analysis, women who had high birth rates exhibited a higher risk of anemia than those who had low birth rates¹⁷.

A review of the literature revealed that pregnant women who consume heme are protected from anemia or iron deficiency¹⁸. Similar findings were found in a prior study, which concluded that non-heme iron from plant foods did not offer as good a defense against anemia as heme iron from animal products (fish, meat, eggs and poultry). The same study discovered that drinking tea only prevented the absorption of iron when it was paired with non-heme iron-containing meals¹⁹.

Animal products supply high-quality protein material and aid in the absorption of iron because protein components can boost the body's ability to absorb iron. Previous research on the impact of dietary variables, such as heme, on iron absorption revealed

that these effects were not always related to iron storage and iron status (as evaluated by ferritin levels)²⁰. Only meat eating was consistently (and favorably) linked in the study to increased blood ferritin levels. This study reveals that tea drinking has a significant impact on iron deficiency and that there is a favorable relationship between tea tannin levels and serum ferritin levels²¹.

Previous research has demonstrated that drinking tea decreases the amount of iron that is absorbed from the digestive system. The researchers accredited this discovery to the polyphenols in tea, which combined with the iron to produce complexes that prevented absorption. In a prior study, it was discovered that having tea without milk reduced the amount of iron that could be absorbed from solutions of ferric chloride and ferrous sulphate (t = 2.68, p 0.05 and t = 4.46, p 0.01, respectively)²².

According to a case study from Italy, a young woman who had hypermenorrhea and anemia due to iron deficiency did not start to benefit from oral iron therapy until her long-standing habit of consuming a lot of tea was broken²³. Another study found that adding tea to the test meal instead of water significantly reduced the amount of iron absorbed. Previous research has found no connection between men's, premenopausal women's, and postmenopausal women's serum ferritin levels and the type of tea they drink (for example, black, green, or herbal tea)²⁴. Regarding tea hardness, brewing time, or drinking time, the similar analysis showed no variations in blood ferritin concentrations across groups of tea consumers.

The authors of a systematic review of 35 studies on the effects of tea intake on iron levels in the UK people came to the conclusion that while drinking tea decreases the non-heme iron absorption from food, there is not enough data to make any firm judgments about this matter²⁵. They also came to the conclusion that the results were barely affected by adding milk to the tea. They argued that while those at risk for iron shortage should avoid tea at mealtimes, healthy individuals with low risk of iron deficiency should not limit their intake of tea. Previous research has demonstrated that some of the most significant risk factors for iron deficiency anemia in pregnant women are infant feeding methods, eating habits, parasitic infections, childbirth, early marriage age, gestational age, and geographic location. Additionally, several studies have demonstrated a strong relationship between hemoglobin concentration and the occurrence of anemia and gestational age, ethnicity, domicile, and income. Additionally, they noted that as gestational age increased, the hemoglobin levels in pregnant women declined²⁶.

There are claims that breastfeeding and socioeconomic level have an impact on anemia incidence. Compared to women from non-minority groups, females from minority groups had an augmented risk of developing anemia. Additionally, women with high fertility, prolonged nursing, and high socioeconomic level had decreased anemia rates.

CONCLUSIONS

Anemia was found in pregnant women who drank tea. This study suggests that judicious ways of consuming tea and avoiding thickening it can be recommended to avoid its harmful effects. It is worth making the public aware that the most popular drink after water is not recommended during the period of physiological transformation of the body and giving birth to another human being.

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