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FREQUENCY OF PICA AND ITS RELATIONSHIP WITH ANEMIA AMONG PREGNANT WOMEN PRESENTING IN TERTIARY CARE SETTING

[1]Faiza Noor, [2]Shaherzad Sohail

[1]Postgraduate Resident, Obstetrician and Gynecologist, Shalamar Hospital, Lahore. faizasahar662@gmail.com
[2]Obstetrician and Gynaecologist, Head of Department OBGYN, Shalamar Medical and Dental College, Lahore. drshaherzad@gmail.com
***Corresponding Author: Faiza Noor,** faizasahar662@gmail.com

ABSTRACT:
Objectives: To determine the frequency of PICA among pregnant females with iron deficiency anemia and to compare mean hemoglobin levels among iron deficient pregnant females with and without pica.
Study Design: cross-sectional study.
Settings: Department of Obstetrics and Gynaecology, Shalamar Hospital, Lahore
Duration of study: 03 April, 2025 to 03 October 2025.
Methodology: total 250 women aged 18–40 with singleton pregnancies and iron deficiency anemia were included. Pregnant women with a history of PICA, chronic illnesses, heavy menstrual flow, family history of anemia, anemia in a prior pregnancy, and morning sickness-related vomiting were not included. Age, gestational age, parity, and family history of pica were recorded for each participant. Patients were then questioned about Pica, or the consumption of nonfood objects, how often they were used, and which trimester she had developed this practice. Nonfood items and the amount of time spent using them were recorded if a woman reported being PICA. Hb values were obtained from one of our hospital's labs.
Results: The study's participants ranged in age from 18 to 40 years, with a mean age of 29.86 ± 5.66 years. The average gestational age was 28.96 ± 5.40 weeks. The average parity was 2.83 ± 1.10. The average BMI was 29.08 ± 3.14 kg/m2. Frequency of PICA among pregnant females with iron deficiency anemia attending antenatal clinic was 83 (33.20%) patients with raw rice as the most common item followed by ice. Mean hemoglobin levels among iron deficient pregnant females with pica were 9.49 ± 1.15 g/dl and without pica were 10.13 ± 1.61 g/dl with significant p-value of 0.001.
Conclusion: Due to behavioral and cultural variables, pica is still common among pregnant women. To reduce potential health hazards for both mother and child, routine pica screening and focused education during prenatal care are advised.

KEYWORDS: Anemia, hemoglobin, PICA.

INTRODUCTION:

The World Health Organization defines anemia as a condition in which the total number of red blood cells or hemoglobin concentration falls below certain thresholds.[1] Because anemia during pregnancy has detrimental effects on the health of both the mother and the fetus, it is a serious public health issue. According to the National Nutrition Survey, the prevalence of anemia in pregnant women is alarmingly high in Pakistan, where nutritional deficiencies are prevalent, at 53.8%.[2] Pregnancy-related pica, a disease characterized by sporadic cravings for non-food things, is a serious worry. Clay, ice, starch, chalk, and dirt are among the non-food cravings that have been connected to pica during pregnancy.[3] A significant incidence of pica in the anemic pregnant women was demonstrated by the fact that around 63.5% of pregnant participants with iron deficiency anemia engaged in pica behavior.[4] Despite the potential health hazards, pica habits are accepted and normalized due to cultural norms and preconceived notions about pregnant women.[5] Additionally, socioeconomic issues including poverty and limited access to nutrient-dense foods exacerbate nutritional deficiencies, which leads to the adoption of pica as a coping mechanism.[6]

The idea that pica consumption is caused by a shortage of micronutrients is supported by the positive link between pica and iron deficiency anemia, even if cross-sectional research cannot prove causation. This idea is supported by the fact that pica is more common in later pregnancy, when nutritional needs are larger.[7] According to a study, iron deficiency symptoms can be exacerbated by non-food items that bind to iron in the gastrointestinal tract. Iron deficiency is common in poor countries like Pakistan due to inadequate dietary intake and restricted access to prenatal care, which might lead to pica as a coping strategy.[6] However, ingesting non-food items raises iron deficiency and puts the mother and developing fetus at considerable risk for health issues. It is essential to comprehend the behaviors associated with pica in anemic pregnant women in order to create preventative measures that will lessen its detrimental effects. By examining the prevalence of pica among pregnant women in Pakistan who have anemia and the cultural, socioeconomic, and nutritional factors influencing pica practices in

this community, this study aims to close this gap.
Pica, characterized by cravings and consumption of non-food items, has been associated with low birth weight and anemia.[6] To identify individuals who are at risk and develop targeted interventions to address this behavior, it is critical to understand the incidence of pica in connection to anemia during pregnancy. Among the numerous adverse outcomes associated with anemia during pregnancy, which is very prevalent in Pakistan, are preterm birth, low birth weight, and maternal morbidity and death.[8] Because non-food medications can exacerbate nutritional deficiencies by preventing the absorption of vitamins, these dangers are heightened when pica and anemia coexist. Despite the potential health consequences, little is known about pica, especially in Pakistan among pregnant women who are anemic, and the practices associated with it. By investigating the prevalence of pica in this susceptible group and the dietary, socioeconomic, and cultural factors influencing pica behaviors, this study seeks to fill this vacuum in the literature. The goal of this study is to advance our understanding of the complex connections between pregnancy-related anemia and pica.

METHODOLOGY:
The ethical review committee approved this descriptive cross-sectional survey, which was completed by 250 women between 03 April 2025 and 03 October 2025. With a 95% confidence level and a 6% margin of error, the projected sample size is 250 cases, or 63.3%[4] of the expected percentage of PICA in pregnant women with iron deficient anemia. Serum ferritin concentrations <30g/L together with Hb<11g/dl in the first trimester, <30g/L together with Hb<10.5g/dl in the second trimester, and <30g/L together with Hb<11g/dl in the third trimester were included in the study, which included women aged 18–40 with singleton pregnancies and iron deficiency anemia. Pregnant women with a history of PICA, chronic illnesses (diabetes, hypertension, heart disease, and renal disease), heavy menstrual flow, family history of anemia, anemia in a prior pregnancy, and morning sickness-related vomiting were not included.
Each woman gave written informed consent to participate in the study and have her data used for research purposes. Age, gestational age, parity, and family history of pica were recorded for each participant. Patients were then questioned about Pica, or the consumption of nonfood objects, how often they were used, and which trimester she had developed this practice. The compulsive consumption of nonfood items like soil, clay, laundry starch, ice, ashes, plasters, paint chips, and coffee grinds is known as pica. Nonfood items and the amount of time spent using them were recorded if a woman reported being PICA. Hb values were obtained from one of our hospital's labs. A proforma was used to gather all of this data.
SPSS version 22.0 was used to enter and evaluate the gathered data. By computing the mean and standard deviation, quantitative factors such as age and gestational age were displayed. By computing frequency and percentages, the trimester in which she began consuming nonfood items, her education level, her family history of PICA, and her parity were displayed. PICA item usage and its presence or absence were displayed as percentages and frequencies. Hemoglobin levels' mean and standard deviation were determined, and the t-test was used to compare PICA with non-PICA. Significant was defined as $P \leq 0.05$.

RESULTS:
The study's participants ranged in age from 18 to 40 years, with a mean age of 29.86 ± 5.66 years. According to Table I, the majority of the patients, 151 (60.40%), were between the ages of 31 and 40. The average gestational age was 28.96 ± 5.40 weeks. The average parity was 2.83 ± 1.10. The average BMI was 29.08 ± 3.14 kg/m2. Table I displays the distribution of patients by variables. Figure I shows frequency of PICA among pregnant females with iron deficiency anemia attending antenatal clinic as 83 (33.20%) with raw rice as the most common item followed by ice (Table II). Mean hemoglobin levels among iron deficient pregnant females with pica were 9.49 ± 1.15 g/dl and without pica were 10.13 ± 1.61 g/dl with significant p-value of 0.001 (Table III).

Table I: Distribution of variables (n=250)

		Frequency	%age
Age (years)	18-30	99	39.60
	31-40	151	60.40
Gestational age	1st trimester	101	40.40
	2nd trimester	78	31.20
	3rd trimester	71	28.40
Parity	≤3	154	61.60
	>3	96	38.40
BMI (kg/m^2)	≤30	163	65.20
	>30	87	34.80
Family h/o PICA	Yes	84	33.60
	No	166	66.40
Education	Uneducated	143	57.20
	Educated	107	42.80

Figure-I: Frequency of PICA among pregnant females with iron deficiency anemia attending antenatal clinic (n=250).

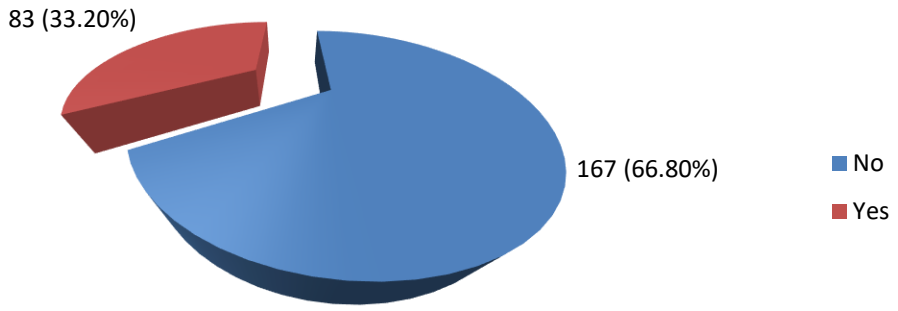


Table II: Different PICA items (n=83)

PICA items	Frequency (%)
Clay	04 (4.82%)
Ashes	02 (2.41%)
Raw rice	42 (50.62%)
Chawk	03 (3.61%)
Soap	00 (0.0%)
Laundary starch	00 (0.0%)
Plasters	05 (6.02%)
Paint chips	03 (3.61%)
Ice	19 (22.89%)
Soil	08 (9.64%)

Table III: Comparison of the mean hemoglobin levels among iron deficient pregnant females with and without pica.

	PICA (Yes) (n=83)	**PICA (No) (n=167)**	**P-value**
Hemoglobin (g/dl)	9.49 ± 1.15	10.13 ± 1.61	**0.001**

DISCUSSION:

Pregnancy-related pica can have a major negative influence on both the mother's and the unborn child's health. A high rate of abortions, low birth weight, obstetric problems, and postpartum depression are among the unfavorable effects of pica that are linked to metabolic, endocrine, psychological, and nutritional alterations that have an adverse influence on both the mother and her fetus.[9,10] In spite of this, expecting mothers continue to engage in pica practice. The 18–40 age range demonstrates that the practice is seen as appropriate for the majority of expectant mothers and is applicable to all age groups. Education was linked to the pica practice, and over half of the participants had completed high school. This suggests that pica practice was linked to educational attainment. Women who had received schooling were probably literate and aware of some of the risks to their health that came with pica. Research has indicated a correlation between educational attainment and health behaviors.[11-13] Additionally, the study found that multiparous women with a history of pica were more likely to engage in pica, indicating that prior pica practice is linked to pica practice during subsequent pregnancies.

According to the study, pregnant women frequently engage in pica practices. Pregnant women's pica prevalence is similar to previous research conducted in Lusaka, Zambia.[14] The prevalence of pica in pregnant women in Lusaka was reported by Shinondo and Mwikuma to be 31.8%; this study's results are comparable to their findings (33.20%). This study's pica prevalence is comparatively similar to other research done in African nations, including Ghana (47.5%), South Africa (54.0%), and Nigeria (38.9%).[15-17] This discrepancy could be explained by regional variances as well as methodological issues in the different studies. Raw rice was the most popular and preferred non-food item consumed by pregnant women, according to the study's findings. This supports the results of earlier studies showing that the most common non-food item ingested during pregnancy is raw rice.[15,16]

Boadu found in a related study that pregnant women consumed a lot of ice and dirt, with ice coming in second with 20.45% and soil with 58.44% of the pregnant women's pica items. According to the results of this study on drug kinds, the majority of women probably use conveniently accessible and readily available non-food substances.[12] Al Nasser and Alsaad claim that consuming earth items including clay, mud, gravel, and tiny stones causes problems that typically affect the colon and intestines. Constipation, discomfort and cramps, obstruction from an indigestible mass, hypokalaemia, and nutritional deficits are some of these. In addition to causing perforation from sharp materials like gravel, geophagia material can harbor infectious pathogens like lead poisoning and helminths.[12] Ingesting ice, or gophagia, has detrimental effects that include reduced food absorption in the gut. This kind of pica is also thought to induce iron insufficiency, tooth decay, and dental sensitivity in the early stages of pregnancy.[12,18]

According to this study, pregnant women with a history of pica had a 1.76-fold increased incidence of anemia. Numerous research from various nations, including Sudan, have documented the effects of pica on pregnancy-related anemia.[19,20] Pica was linked to a higher incidence of anemia in a prior study conducted in eastern Sudan with 466 pregnant women.[19] Anemia was found in 119 (40.8%) of the 292 pregnant women in a prior study conducted in central Sudan; maternal age, parity, education, occupation, and BMI did not correlate with anemia, but pica did.[20] On the other hand, a prior Sudanese investigation carried out in the metropolitan neighborhood of Khartoum revealed no connection between pica and maternal anemia.[21] There are a number of reasons why pica practice and anemia may be related. Among these is the impact of pica on pregnant women's stress and anxiety levels as well as their nutritional state.[22] According to an updated worldwide meta-analysis, pregnant women in rural areas were more likely to contract pica, with a 38% prevalence.[23] The forms of pica (mud, ice, etc.) may have an impact on Hb levels, particularly when compared to metropolitan areas. It would be ideal to conduct a more thorough investigation into how each sort of pica affects Hb levels. Pica, for instance, may make pregnant women more susceptible to helminth infections and micronutrient deficiencies, both of which can cause anemia.[24] Pica may also impair the absorption of iron.[25] Therefore, in order to achieve early diagnosis, treatment, and prevention of consequences, patients with iron deficiency anemia require a comprehensive approach, which includes taking a complete history of pica practices.[26]

Limitations: Participants in the study may have been exposed to information about the hazards of pica because it was carried out in medical institutions where they also got nutrition and health education. Additionally, study participants' self-reports of their pica practices were used to obtain data. Participants might not have disclosed their actual practice as a result of these two reasons.

CONCLUSION:

A vulnerable population, pregnant women have greater nutritional needs for both their own and their unborn child's health and wellbeing. Many pregnant women indulge in the use of non-food substances as a result of the physiological and psychological changes that occur during pregnancy. Sociocultural factors that tend to promote the use of these substances exacerbate the practice of pica among expectant mothers. This has been noted not only in Pakistan but also in other nations where the health consequences of pica practice are not well understood. Given how common pica practice is in this group, it is imperative that concerns be raised regarding its regular occurrence in prenatal care facilities. Health care professionals may be able to evaluate and take action if they recognize the importance of pica practice in comprehensive care and document it in medical records. We advocate for the inclusion of pica assessment and education in prenatal care as well as among reproductive-age women in their communities.

The study's conclusions suggest a number of important directions for further investigation. Future studies on pica in pregnant women must go beyond prevalence and look at etiology, progression, health effects, and the efficacy of interventions. In order to comprehend the temporal dynamics of pica and to develop interventions that enhance the health outcomes of both mothers and fetuses, longitudinal and interventional research are particularly important. To produce useful insights, interdisciplinary approaches that integrate medical, dietary, behavioral, and cultural viewpoints will be crucial.

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