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Original Research Article

A community based cross-sectional study on compliance and barriers of iron and folic acid consumption among postnatal mothers of 0-6 weeks in an urban area from central India

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ABSTRACT

Background: Iron deficiency anemia is becoming prevalent in postpartum women who are not aware about the importance of iron and folic acid (IFA) consumption. There might be many barriers which ultimately result in noncompliance. Thus, this study aimed in assessing compliance and barriers of IFA consumption among postnatal women.
Methods: A cross-sectional study was conducted in 175 postnatal mothers in an urban area from Nagpur. A semi-structured questionnaire was used to assess the compliance and barriers to IFA consumption. Adherence level was assessed using the Morisky medication adherence scale.
Results: The study found that 71% of the study participants were compliant to IFA consumption. Among the non-adherent participants, the main barrier found was the knowledge barrier and the prevailing side effects. According to the Morisky medication adherence scale, the majority exhibited a strong adherence.
Conclusions: About three fourth of the participants were compliant to IFA consumption. Compliance was found significant among those who were primigravida, higher monthly income, received health education regarding IFA and intake of IFA during ANC period. Considering the barriers observed in the study the major recommendation will be to improve the palatability and enhance the health education.

Keywords: Barriers, Compliance, IFA consumption, Postnatal women

INTRODUCTION

Anemia is characterized by a reduction in the quantity of red blood cells (RBCs) or a lower-than-normal hemoglobin (Hb) level.[1] While specific data on the prevalence of anemia in postnatal mothers is not available, related statistics suggest it may be a significant issue. According to the National Family Health Survey-5 (NFHS-5), anemia affects 57% of women in the reproductive age group and 52.2% of pregnant women.[2] The World Health Organization (WHO) defines anemia as a condition where blood hemoglobin concentration falls below 11 mg/dl or when the hematocrit is less than 37%.

The postnatal period represents a crucial transition for both mothers and newborns. Despite the fact that many complications observed in postnatal period result in anemia, this period sees the highest rates of maternal and infant mortality, it often receives inadequate attention in terms of quality care provision, particularly in countries with limited resources. This neglect is especially concerning given the critical nature of the postnatal phase for maternal and infant health outcomes.[3]

Globally, iron deficiency stands out as a leading cause of anemia, with women in developing countries being particularly affected. However, in India, the situation is more severe, with the prevalence of anemia among postnatal women varies widely across different states because of various factors. This contrast between developing and developed countries highlights the significant health disparity and the urgent need for targeted interventions in developing regions, especially in India.[4]

Postnatal anemia manifests through various physical symptoms, including fatigue, disrupted endocrine function, and reduced immunity to infections, all of which can hinder the lactation process. The condition also has cognitive and emotional impacts, such as impaired cognitive function, increased irritability, and a higher risk of postpartum depression. These effects can negatively influence the crucial maternal-infant bonding process and diminish the mother's overall quality of life.[4] These consequences highlight the far-reaching effects of anemia on both maternal health and the well-being of the newborn, emphasizing the importance of addressing this condition in the postnatal period.[5]

Iron and folic acid (IFA) supplementation is a key strategy in preventing anemia and folic acid deficiency.[5] Despite India's implementation of various government initiatives to combat anemia, the prevalence of postnatal anemia in the country remains alarmingly high. The National Family Health Survey (NFHS)-5 reports that only 26.0% of pregnant women in India adhere to IFA supplementation guidelines. Notably, there is a lack of data regarding IFA adherence among postnatal women, highlighting a significant gap in our understanding of this crucial aspect of maternal health care.

While numerous studies have investigated the prevalence of anemia in pregnant women and examined the compliance and barriers to iron and folic acid (IFA) supplementation during pregnancy, there is a noticeable gap in research focusing on postnatal mothers, particularly in developing countries like India.

Recognizing this research gap, the present study aimed on assessing both the compliance of IFA consumption and the barriers to its use among postnatal mothers during the critical period of 0-6 weeks after childbirth. By concentrating on this understudied population and timeframe, this study seeks to provide valuable insights that could inform more effective strategies for improving maternal health outcomes in the postnatal period.

METHODS

A community based cross-sectional study was conducted in the Urban field practice area of a tertiary care centre in Nagpur from October 2023 to December 2023 for a period of 3 months among postnatal mothers (0-6 weeks post-delivery).

Inclusion criteria

Mothers who delivered within the last 6 weeks and had received advice to consume IFA tablets at least 1 week prior to data collection.

Exclusion criteria

Postnatal mothers with documented hemoglobinopathies, any medical reasons prohibiting iron consumption, and those who denied the consent to participate in the study.

Sample size

The prevalence of compliance to iron and folic acid consumption in immunization centers at various health facilities in Bhubaneswar, Odisha as per study conducted by Moonjelly Vijayan Smitha et al was 79.2% and the sample size was calculated considering the absolute precision at 6%, desired confidence interval to be 95%, the sample size derived was 175 as calculated using the Open Epi (version 3.01).[4]

Data collection method and tools

Prior to commencing of the study, ethical clearance was obtained from the institutional ethics committee at Government Medical College, Nagpur, Maharashtra, India. After including the study participants, the informed written consent was secured from all participants before the start of data collection. Participants were selected using convenience sampling from urban areas with the assistance of accredited social health activists (ASHAs). A total of 270 registered postnatal mothers were identified in the selected areas. Ultimately, data were gathered from 175 postnatal women who were available at the time of data collection and willing to participate.

Data collection involved house-to-house visits and conducting face-to-face interviews using a semi-structured questionnaire. Following an extensive literature review, a semi-structured questionnaire was developed. This questionnaire included a demographic profile section like age, level of education, marital status, financial status and is designed to evaluate compliance to IFA supplementation as well as identify barriers to its consumption.

The study assessed adherence to iron and folic acid consumption among compliant participants using the Morisky Medication Adherence Scale, developed by Donald Morisky from the University of California, Los Angeles. Participants were provided with binary response options (yes/no), with 1 point awarded for each response marked yes and 0 points for each response as no. The scale comprises total 4 questions and adherence levels were categorized as follows: low adherence (score 3-4), medium adherence (score 1-2), and high adherence (score 0).

Operational definitions

Compliance

Passive behaviour in which a patient is following a list of instructions from the doctor.

In this study, we have considered women who consumed all the prescribed IFA tablet after their delivery as compliant and those who did not consume as non-compliant.

Adherence

Active choice of patients to follow through with the prescribed treatment while taking responsibility for their own well-being.

Requirement of IFA

The national protocol specifies that postnatal women with hemoglobin (Hb) levels exceeding 11 mg/dl receive a daily supplement of one tablet containing 60 mg of elemental iron and 0.5 mg of folic acid for 180 days to prevent anemia. For women with Hb levels ranging from 8 to 11 mg/dl, the protocol prescribes two tablets daily-one in the morning and one in the evening- 200 mg of iron and 0.5 mg of folic acid for a duration of 180 days to treat anemia.

Data analysis

Data obtained from study participants were entered into Epi Data Entry V3.1, and descriptive statistics, as well as chi-square analysis, were conducted using EpiData Analysis V2.2.2.182. To study the relationship between adherence to IFA supplementation and key factors, multiple logistic regression analysis was carried out using IBM SPSS statistics V20 trial version. Statistical significance was defined as a p value less than 0.05.

RESULTS

A total of 175 postnatal women (0-6 months post-delivery) were invited to participate in the study after providing informed written consent. The mean age of the participants was 28.25±3.9 years. the majority of mothers (58.7%) were between the ages of 26 and 30.

Table 1: Sociodemographic characteristics associated with compliance to IFA tablets among study population.

Sociodemographic factors		Compliant (n=124) N (%)	Non-compliant (n=51) N (%)	Total (n=175) N (%)	Chi-square	P value
Age (years)	21-25	27 (21.8)	13 (25.5)	40 (22.9)	1.2625	0.738
	26-30	70 (56.6)	30 (58.8)	100 (57.1)		
	31-35	17 (13.7)	6 (11.7)	23 (13.1)		
	36-40	10 (8)	2 (4)	12 (6.9)		
Education	Middle school	12 (9.7)	10 (19.6)	22 (12.5)	13.9933	<0.001*
	Higher secondary	44 (35.5)	23 (45.1)	67 (38.3)		
	Graduate	43 (34.7)	18 (35.3)	61 (34.9)		
	Post graduate	25 (20.1)	0	25 (14.3)		
Occupation	Semi-skilled	14 (11.3)	6 (11.8)	20 (11.4)	5.3454	0.064
	Skilled	28 (22.6)	4 (7.8)	32 (18.3)		
	Homemaker	82 (66.1)	41 (80.4)	123 (70.3)		
Religion	Hindu	112 (90.3)	50 (98)	162 (92.6)	3.7252	0.392
	Buddhist	6 (4.9)	0	6 (3.4)		
	Christian	2 (1.6)	0	2 (1.1)		
	Muslim	4 (3.2)	1 (2)	5 (2.9)		
Type of family	Three generation	0	2 (4)	2 (1.2)	4.9767	0.121
	Joint	58 (46.8)	22 (43.1)	80 (45.7)		
	Nuclear	66 (53.2)	27 (52.9)	93 (53.1)		
Monthly income	<10,000	18 (14.5)	4 (7.8)	22 (12.6)	15.0868	0.001*
	10k-30k	48 (38.7)	32 (62.7)	80 (45.7)		
	31k-50k	26 (21)	13 (25.5)	39 (22.3)		
	>50,000	32 (25.8)	2 (4)	34 (19.4)		
Socio-economic status	Class I	8 (6.5)	4 (7.8)	12 (6.9)	4.0773	0.356
	Class II	17 (13.7)	2 (4)	19 (10.9)		
	Class III	39 (31.5)	18 (35.2)	57 (32.5)		
	Class IV	59 (47.6)	27 (53)	86 (49.1)		
	Class V	1 (0.8)	0	1 (0.6)		

*Statistically significant.

Table 2: Obstetric factors associated with compliance to IFA tablets among study population.

Obstetric factors		Compliant (n=124) N (%)	Non-compliant (n=51) N (%)	Total (n=175) N (%)	Chi-square	P value
No. of gravida	1	63 (50.8)	14 (27.4)	77 (44)	8.0950	0.012*
	2	57 (46)	34 (66.7)	91 (52)		
	≥3	4 (3.2)	3 (5.9)	7 (4)		
No. of abortions	1	25 (20.2)	8 (15.7)	33 (18.9)	2.4845	0.529
	2	8 (6.5)	6 (11.7)	14 (8)		
	>2	2 (1.6)	0	2 (1.1)		
	Not happened	89 (71.7)	37 (72.6)	126 (72)		
Type of delivery	LSCS	54 (43.5)	28 (55)	82 (46.9)	1.8707	0.186
	Normal vaginal delivery	70 (56.5)	23 (45)	93 (53.1)		
Birth complications	Yes	39 (31.5)	10 (19.6)	49 (28)	2.5145	0.139
	No	85 (68.5)	41 (80.4)	126 (72)		
IFA taken during ANC	Yes	122 (98.4)	43 (84.3)	165 (94.3)	13.2844	0.001*
	No	2 (1.6)	8 (15.7)	10 (5.7)		
Deworming before pregnancy	Yes	22 (17.7)	2 (4)	24 (13.7)	5.8329	0.012*
	No	102 (82.3)	49 (96)	151 (86.3)		
Health education	Yes	97 (78.2)	18 (35.3)	115 (65.7)	29.5622	<0.001*
	No	27 (21.8)	33 (64.7)	60 (34.3)		

*Statistically significant.

Approximately 38.3% had completed higher secondary education, while 34.9% had obtained a postgraduate degree. The majority of participants (90%) were Hindus. About 49.1% were classified under class V socioeconomic status according to the modified Kuppuswamy scale (Table 1).

About 52% were in their second parity, and 53.1% had experienced a normal vaginal delivery. The higher compliance to iron-folic acid during the postnatal period were found statistically significant among those who were primigravida, had increased monthly income, had received health education regarding IFA and those who had taken IFA during ANC period.

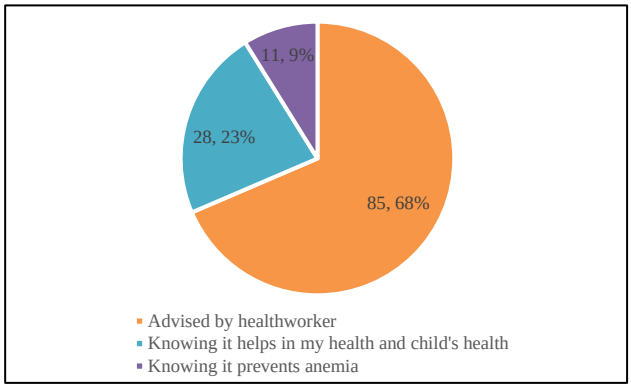

Figure 1: Reasons for taking IFA tablets in compliant women (n=124).

In this study, 124 (70.8%) were compliant and 51 (29.1%) were non-compliant towards IFA consumption. In non-compliant participants, the barriers to intake of IFA tablets included a lack of awareness about the importance of IFA (39%), discomfort associated with the supplements (37%), and side effects (4%) (Figure 2).

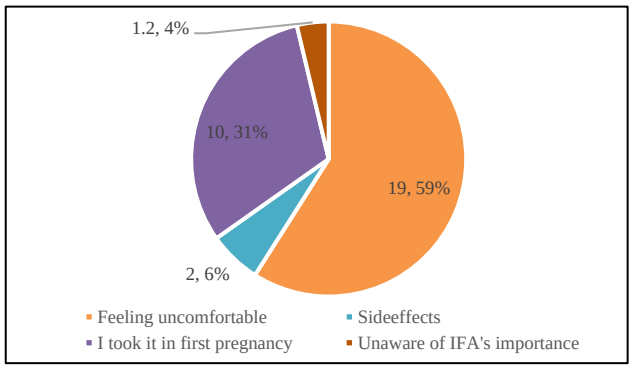

Figure 2: Reasons for not taking IFA tablets in non-compliant women (n=51).

Non-adherent participants reported experiencing side effects such as heartburn (24.5%) and nausea (12.2%). In contrast, 80% of those who adhered to the regimen reported no side effects.

In non-compliant participants, adherence was assessed using the Morisky medication adherence scale. The results revealed that 37.9% demonstrated high adherence, 22.5% showed moderate adherence, and 39.5% exhibited low adherence, indicating overall non-adherence (Figure 3).

As per multiple logistic regression, factors like number of gravida (AOR:2.18; CI: 1.07-4.45), IFA taken during ANC period (AOR:5.40; CI: 1.01-28.64), Deworming done in last 6 months (AOR:4.86; CI: 1.01-23.42) and Health education regarding IFA (AOR:5.91; CI: 2.72-

12.86) were having positive association with compliance of IFA consumption.

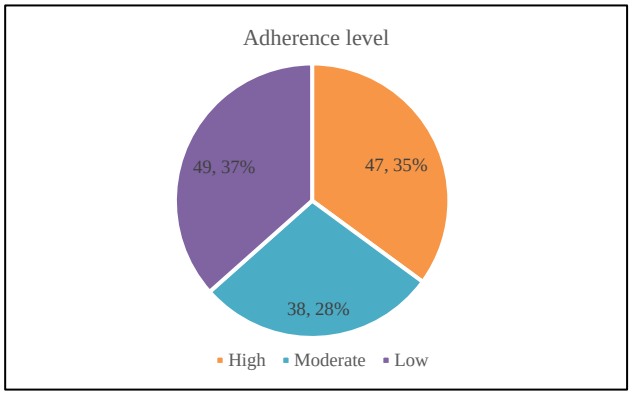

Figure 3: Adherence to IFA tablets according to 4-item Moresby medication adherence scale among postnatal mothers (n=124).

DISCUSSION

This study examines the prevalence of Iron and Folic Acid (IFA) consumption among postnatal mothers and identifies barriers to adherence. Our findings indicate that 71% of participants were compliant to IFA consumption, a notably higher rate compared to the compliance observed during the antenatal care (ANC) period, as reported in NFHS-5. Although this study focuses on a relatively small sample, its findings may not be applicable on a national scale.

This study demonstrates higher compliance rates among postnatal women compared to research conducted in Odisha and Gujarat, which reported compliance rates of 20.8% and 18.6%, respectively. The present study focused on women in an urban setting, whereas the study conducted in Odisha included those attending vaccination centers where both rural and urban populations were encountered, leading to variations in compliance levels.[4,6,8]

This study distinguished between adherence and compliance, noting a slight difference between the two. Among those who were compliant, 60.5% were adherent to the treatment. This highlights the need to increase awareness about the importance of consistent IFA supplementation. Additionally, addressing barriers to non-adherence is crucial. This study found that while 100% of participants delivered in institutional settings, only 71% were compliant to IFA supplementation after delivery. This result is consistent with a study conducted in Odisha, which reported that 99% of deliveries were institutional, but only 20.8% were compliant to IFA supplementation, with 93% lacking awareness about its importance postpartum. Similarly, the findings align with a study conducted in Ethiopia, which reported a compliance rate of 60.1%.[4,5]

The current study also emphasizes that the health education provided to 65.7% of participants on the significance of IFA supplementation contributed to higher compliance rates among postnatal mothers. This finding is consistent with a study conducted in Ethiopia, where 71.3% of participants received similar health education. This study found that higher-income families exhibit better compliance with IFA supplementation, a trend consistent with findings from Odisha, which reported lower compliance among lower-income families. Similarly, study conducted in Ethiopia also found that higher-income families demonstrated better compliance.[4,5,9]

The Morisky medication adherence scale for the first time in postnatal women to evaluate adherence to IFA supplementation, and it revealed a high level of adherence. The scale was previously used among antenatal mothers to assess the compliance in a study conducted in Pondicherry.[7]

A key limitation of this study is its focus on an urban population, which limits the generalisability of the findings. Conducting similar research in rural areas would provide a clearer picture of compliance in different settings.

CONCLUSION

Our study concludes that compliance with IFA supplementation is moderately high, surpassing the national average for antenatal mothers as well as rates reported in other postnatal studies. Notably, higher compliance is observed among primigravida women, those from higher socioeconomic backgrounds, individuals who received health education on IFA supplementation, and those who had taken IFA during the antenatal period. While adherence among compliant mothers is also evident, with more than half of the participants demonstrating strong adherence. As it was observed that side effects were one of the barriers, few recommendations could enhance adherence to IFA consumption like improving the palatability of the tablets through flavour coatings, reducing the tablet size and dosage frequency, and providing more focused counselling on the importance of iron and folic acid intake.

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