Socio-Demographic and Obstetrical Factors Influencing Consumption of Iron and Calcium Supplement in A Rural Community

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ABSTRACT

Background: Calcium supplementation during pregnancy has a proven potential to reduce adverse gestational outcomes, in particular by decreasing the risk of developing hypertensive disorders during gestation. **Objective:** to evaluate various factors influencing the consumption of iron folic acid and calcium tablets supplementation during pregnancy.

Methodology: A community based analytical cross-sectional study was conducted among 200 women in the rural field practice area of Jhalawar. Data were collected by house to house visit and analyzed using chi-square test.

Results: Only 55.5% pregnant women have taken IFA tablets while 23.5% women have taken tablets of calcium during their pregnancy. IFA consumption was significantly associated with level of education of women and their husband, socio-economic class, type of family, number of ANC visits and presence of husband during those visits and mass media exposure Calcium consumption were also associated with level of education of women, socio-economic class, number of ANC visits and presence of husband during those visits.

Conclusions: Consumption of IFA tablets was higher than the national level however calcium consumption was low. Emphasis should be given on early registration, multiple ANC visits, role of family and husband in caring of mother during pregnancy to improve consumptions of IFA and Calcium supplements.

Keywords: Anaemia, Calcium Supplementation, Folic Acid, Iron, Pregnant Women

INTRODUCTION

Anaemia is a major problem in obstetrics and perinatal care especially in developing nations like India. Over the world more than 40% of pregnant women are anaemic. More than half of this anaemia burden is assumed to be due to low iron status. Pregnant women need additional iron and folic acid (IFA) to meet their own nutritional requirements and for the developing fetus. During pregnancy, deficiencies of iron and folic acid can negatively impact the health of the mother as well as fetal development.[1]

According to WHO, haemoglobin level below 11g/dL can be regarded as true anaemia regardless of gestational age.[2]The main cause of anaemia in obstetrics is iron deficiency, which has a worldwide prevalence between estimated 20%-80% and consists of a pri-

marily female population.[3] Pregnancy anaemia can be aggravated by various conditions such as uterine or placental bleedings, gastrointestinal bleedings and peripartum blood loss. Along with that folate deficiency and vitamin B12 deficiency also contribute significantly to this condition.[4,5]

Calcium is one of the important elements for normal physiologic function, especially during pregnancy for both mothers and fetuses. The increased requirement for calcium by growing fetus during pregnancy results not only in increasing maternal bone turnover but also in impacting on infants' bone density.[6,7] Calcium supplementation during pregnancy has a proven potential to reduce adverse gestational outcomes, in particular by declining the risk of developing hypertensive disorders during gestation, which are associated with a significant number of maternal mortality and considerable risk of preterm birth, the leading cause of early neonatal and infant mortality.[8]

The comprehensive information about influencing factors for iron and calcium consumption in pregnancy is very important for policymakers to improve consumption of iron and calcium and overall health status of pregnant women and their offspring's.

OBJECTIVES

This study was conducted to estimate status of IFA and Calcium consumption during pregnancy among recently delivered women and also to evaluate various factors influencing the consumption of iron folic acid and calcium tablets supplementation during pregnancy.

METHODOLOGY

After obtaining prior permission from the institutional ethical review board, a community based analytical cross-sectional study was conducted in the rural field practice area of community medicine department, Jhalawar during September2019 to February 2020. The study population was females who had recently delivered within one year of the study. Written informed consent was obtained from the study participants after explaining the study in the local language. Those who consented and fulfilled our eligibility criteria were included. Consumption of at least 90 IFA (Iron and folic acid) and 90 Calcium tablets during pregnancy was considered as the dependent variable. Consumption of 90 or more IFA and Calcium tablets during pregnancy was considered as adequate intake and consumption of less than 90 IFA and 90 Calcium tablets or not consuming any tablet during pregnancy was considered as inadequate intake. Variables such as socio-demographic and obstetric variables were taken as possible independent determinants of IFA consumption and recoded into a categorical variable.

Sample size: Calculated by using the formula, $n=4pq/l2$ based on assuming 50% women consuming IFA tablets during pregnancy with 95% confidence interval and a relative error of 15% of p. Sample size of 177.8 obtained and 10% (17.8) were added for incomplete or poorly filled proforma. Final calculated sample size was 196, after round off obtained size was 200 taken as sample size.

Sampling design: There are 32 villages under RHTC Mandawar, Jhalawar. We have randomly selected four villages and from each village, fifty women who delivered recently were selected by simple random sampling. In the current study simple random sampling without replacement technique was used. Door to door visit was done to record detail information required from recently delivered women. Information was verified with the caregivers wherever necessary.

Study Tools &Methods: The study tool was a semi structured pretested questionnaire constructed after a thorough literature review, using findings of earlier literature. The questionnaire has 2 parts -

1) Baseline questions regarding socio-demographic profile - age, education level, religion, occupation, socio-economic class, husband's education

2) Obstetric questions regarding parity, birth order, antenatal care (ANC), timing of registration, consumption of IFA and calcium tablets, presence of husband during ANC visits, number of ANC visits and exposure to mass media.

Collected data were coded, tabulated and statistically analyzed by using SPSS (TRIAL version 26.0). Descriptive and Inferential statistics were applied (Odd ratio with 95% confidence interval). The level of statistical significance was set at $P < 0.05$, otherwise, the tests were considered insignificant.

RESULTS

In present study, out of 200 participants, mean age was 24.67±4.6 years with age ranging from 18-38 years. Most of the women (75%) were in the age group of 21-30 years. Illiteracy was found in 31% of women while 69% women were literate. Approximately half of women are working (47%). Most of women belong to socioeconomic class IV (48%) while only 3% women were in socioeconomic class I and II. Most of women belong to joint family (61%) and Hindu (82%) by religion. In present study majority of participant had second order of pregnancy (41%) while 29% were primi. Registration and first antenatal check were received in first, second and third trimester by 71%, 23% and 6% of women respectively. 53% women have 4 or more antenatal care visits and 46% women also reported that their husband was present during antenatal visits. 34% women had exposure to social mass media.

In present study, 111(55.5%) pregnant women have taken 90 or more IFA tablets while only 47 (23.5%) women have taken adequate calcium tablets during

pregnancy. In present study, among women taking adequate iron and folic acid tablets, majority (75.7%) were in 21 to 30 years age group followed by ≤20years age group (13.5%). However, there were no significant differences in consumption of iron and folic acid between different age group (p>0.05). Women who were literate have significantly higher (p=0.001) consumption of iron and folic acid (88.3) than women who were illiterate (11.7%). Working status have no significant association with iron folic acid consumption (p=0.96). Among women taking adequate iron and folic acid tablets, 87.4% pregnant women's husband were literate (p=0.001). No

significant difference was observed among the socioeconomic status of pregnant women in consumption of iron and folic acid (p>0.05). Women belongs to joint family consuming more iron and folic acid tablets when compared to women belongs to nuclear family (p=0.03). No significant difference observed in consumption of iron and folic acid with religion (p=0.46) (table -1).

Adequate IFA consumption was high in second pregnancy (47.7%) followed by first (26.1%). IFA consumption with pregnancy order four and above was found significantly lower (p=0.045) than first pregnancy.

Table 1: Association of IFA consumption with Socio-demographic variables

Socio-demographic Characteristic	Iron & Folic Acid tablets		Total (N = 200) (%)	Odd Ratio (95%CI)	P value
	Adequate (n=111) (%)	Inadequate (n=89) (%)			
Age					
≤20	15(13.5)	17 (19.1)	32 (16)	1	
21 – 30	84 (75.7)	66 (74.2)	150 (75)	1.44(0.67-3.10)	0.34
31 – 40	12 (10.8)	6(6.7)	18 (9)	2.26 (0.68-7.53	0.18
Education					
Illiterate	13 (11.7)	49 (55.1)	62 (31)	1	
Literate	98 (88.3)	40 (44.9)	138 (69)	9.23 (4.52-18.84)	< 0.0001
Working Status					
Working	52 (46.8)	42 (47.2)	94 (47)	1	
Non-working	59 (53.2)	47 52.8)	106 (53)	1.01 (0.57-1.77)	0.96
Husband's education					
Illiterate	14 (12.6)	28 (31.5)	42 (21)	1	
Literate	97 (87.4)	61 (68.5)	158 (79)	3.18 (1.55-6.51)	0.001
Socio-economic class					
I & II	4 (3.6)	2 (2.2)	6 (3)	1	
III	39 (35.1)	19 (21.3)	58 (29)	1.02 (0.17-6.10)	0.97
IV	54 (48.7)	42 (47.2)	96 (48)	0.64 (0.11-3.67)	0.61
V	14 (12.6)	26 (29.3)	40 (20)	0.26 (0.04-1.65)	0.15
Type of family					
Joint	75 (67.6)	47 (52.8)	122 (61)	1	
Nuclear	36 (32.4)	42 (47.2)	78 (39)	0.53 (0.30-0.95)	0.03
Religion					
Hindu	93 (84.7)	71 (79.8)	164 (82)	1	
Muslim	18 (16.3)	18(20.2)	36(18)	0.76 (0.37-1.57)	0.46

Table 2: Association of IFA consumption with Obstetrics variables

Variables of pregnancy	Iron & Folic Acid tablets		Total (N = 200) (%)	Odd Ratio (95%CI)	P value
	Adequate (n=111) (%)	Inadequate (n=89) (%)			
Pregnancy order					
First	29(26.1)	29 (32.6)	58 (29)	1	
Second	53(47.7)	29 (32.6)	82 (41)	1.82 (0.92-3.62)	0.08
Third	25 (22.5)	17 (19.1)	42 (21)	1.47 (0.65-3.28)	0.34
Fourth & above	4 (3.6)	14(15.7)	18 (9)	0.28 (0.08-0.97)	0.045
First ANC checkup received					
First Trimester	91 (81.9)	51 (57.3)	142 (71)	1	
Second Trimester	20 (18.1)	26 (29.3)	46 (23)	0.43 (0.21-0.84)	0.014
Third Trimester	0 (0)	12 (13.4)	12 (6)	0.02 (0.001-0.38)	0.009
Number of ANC Visits					
4 or more	66 (59.5)	40 (44.9)	106 (53)	1	
1-3	45(40.5)	49 (55.1)	94 (47)	0.55 (0.31-0.97)	0.041
Presence of husband during ANC visits					
Yes	58 (52.3)	34(38.2)	92 (46)	1	
No	53(47.7)	55 (61.8)	108 (54)	0.56 (0.32-0.99)	0.04
Social Mass media Exposure					
Yes	45(40.5)	23 (25.8)	68 (34)	1	
No	66(59.5)	66 (74.2)	132(66)	0.51 (0.27-0.93)	0.03

Table 3: Association of Calcium consumption with Socio-demographic variables

Socio-demographic Characteristic	Calcium tablets		Total (N = 200) (%)	Odd Ratio (95%CI)	P value
	Adequate (n=47) (%)	Inadequate (n=153) (%)			
Age					
≤20	6(12.8)	26 (17.0)	32 (16)	1	
21 - 30	34 (72.3)	116 (75.8)	150 (75)	1.27 (0.48-3.33)	0.62
31 - 40	7 (14.9)	11 (7.2)	18 (9)	2.75 (0.75-10.10)	0.12
Education					
Illiterate	9(19.1)	53(34.6)	62 (31)	1	
Literate	38 (80.9)	100 (65.4)	138 (69)	2.23 (1.01-4.97)	0.048
Working Status					
Working	22(46.8)	72 (47.1)	94 (47)	1	
Non-working	25 (53.2)	81 (52.9)	106 (53)	1.01 (0.52-1.94)	0.97
Husband's education					
Illiterate	6 (12.8)	36 (23.5)	42 (21)	1	
Literate	41 (87.2)	117(76.5)	158 (79)	2.10 (0.82-5.35)	0.11
Socio-economic class					
I & II	02 (4.3)	04 (2.6)	6 (3)	1	
III	22 (46.8)	36 (23.5)	58 (29)	1.22 (0.20-7.23)	0.82
IV	16 (34.0)	80 (52.3)	96 (48)	0.40 (0.06-2.37)	0.31
V	7(14.9)	33 (21.6)	40 (20)	0.42 (0.06-2.78)	0.37
Type of family					
Joint	29 (61.7)	93 (60.8)	122 (61)	1	
Nuclear	18 (38.3)	60 (39.2)	78 (39)	0.96 (0.49-1.88)	0.91
Religion					
Hindu	38(80.9)	126 (82.3)	164 (82)	1	
Muslim	9 (19.1)	27(17.6)	36 (18)	1.10 (0.47-2.55)	0.81

Table 4: Association of Calcium consumption with Obstetrics variables

Variables of pregnancy	Calcium Tablets		Total (N= 200) (%)	Odd Ratio (95%CI)	P value
	Adequate (n=47) (%)	Inadequate (n=153) (%)			
Pregnancy order					
First	12 (25.5)	46 (30.1)	58 (29)	1	
Second	21 (44.7)	61 (39.9)	82 (41)	1.31 (0.58-2.95)	0.49
Third	8 (17.0)	34 (22.2)	42 (21)	0.90 (.33-2.44)	0.83
Fourth & above	6 (12.8)	12(7.8)	18 (9)	1.91 (0.59-6.16)	0.27
First ANC checkup received					
First Trimester	35 (74.5)	107 (69.9)	142 (71)	1	
Second Trimester	12 (25.5)	34 (22.2)	46 (23)	1.07 (0.50-2.30)	0.84
Third Trimester	0 (0)	12 (7.8)	12 (6)	0.12 (0.01-2.09)	0.14
Number of ANC Visits					
4 or more	31 (66.0)	75 (49.0)	106 (53)	1	
1-3	16 (34.0)	78 (51.0)	94 (47)	0.49 (0.25-0.98)	0.04
Presence of husband during ANC visits					
Yes	35 (74.5)	77 (50.3)	112 (56)	1	
No	12 (25.5)	76 (49.7)	88 (44)	0.34 (0.16-0.71)	0.004
Social Mass media Exposure					
Yes	24 (51.1)	73 (47.7)	97 (49)	1	
No	23 (48.9)	80 (52.3)	103 (51)	0.87 (0.45-1.68)	0.68

Women who have received their first antenatal care during first trimester, were consuming more IFA than women who received first antenatal care in subsequent trimester (p<0.05). Women who attended 4 or more ANC visits were consuming significantly more IFA tablets (p=0.041). Presence of husband during ANC visits has significant association with higher consumption of IFA (p=0.04). Women who have exposure to social mass media were significantly consuming more IFA than women who had no exposure to mass media (p=0.03) (table -2).

Table 3 reveals calcium consumption during pregna-cy. Significant association of adequate calcium consumption was found only with women education (p=0.048). Proportion of adequate Calcium tablets consumption was significantly higher in literate pregnant women. Table 4 depict that 4 or more ANC visits (p=0.04) and presence of husband during ANC visit (p=0.004) were significantly associated with adequate calcium intake. However, there were no significant differences observed among women consuming calcium with pregnancy order, starting of antenatal care in first trimester and exposure to social mass media.

DISCUSSION

IFA and calcium supplement are one of the most important interventions for nutritional status improvement of pregnant women and their new born. Although Government provides free IFA tablets under various schemes, but due to many influencing factors unfortunately pregnant women not adherence to the recommended dose. This study found that 55.5% pregnant women have taken 90 or more IFA tablets while only 23.5% women have taken adequate tablets of calcium during their pregnancy. IFA consumption was higher in present study when compared to NFHS 4[9] and 5[10] data which revealed that 30.3% and 44.1% pregnant women consumed of more than 100 IFA tablet in India respectively. Higher consumption of IFA in present study might be due to the fact that participants were selected from field practice area of tertiary care hospital who had better healthcare services or difference in consumption of number of IFA tablets. Other studies Netra et al[11] (85.7%), Manasa et al [12] (71%) and Selvaraj et al [13] (77%) obtained higher consumption compliance of IFA than present study. Differences in consumption of IFA in different studies might be due to sociocultural factors, health-seeking behaviour, health services availability and number of days for iron consumption.

In present study Women who were literate have significantly higher consumption of iron and folic acid. Pregnant women whose husband were literate consuming significantly more iron and folic acid tablets than women whose husband were illiterate. This indicates education status of both women and their husbands have impact on IFA consumption. Similar results were reported in other studies by Netra et al[11], Chourasiaet al[14] and Chimankar et al[15]. Education is a well-known factor that influencing women's decision making and health seeking behaviour. Women from higher socioeconomic status had consumed significantly more IFA than women from lower socioeconomic status was reported by Chourasia et al [14] and Wendt A et al[16] although present study does not establish such association. Higher socioeconomic status associated with more consumption of IFA tablets might be due to affordability of health services, better educational opportunities and knowledge. Similar to present study, Netra et al[11] also reported no association between socioeconomic status and IFA consumption. In present study women belongs to joint family consuming significantly more iron tablets than nuclear family. Maternal age, working status and religion has no association with IFA consumption. First birth order has significant association with adequate consumption of IFA. Similar to present study other studies done by Chourasia et al[14]and Mahapatro SR et al[17] also found that with higher order of pregnancy consumption of IFA tablets was decreases. Less consumption of IFA among higher birth order women might be due to low education, poor socio-economic status and ignorance towards health.

ANC check-up early in first trimester and 4 or more ANC visits were significantly associated with more consumption of IFA tablets. Similar results were reported by Chourasia et al[14] and Wendt A et al[16]. Early initiation ANC and 4 or more ANC visits might increase counselling, awareness regarding care during pregnancy and adherence to IFA. In this study, it was observed that husbands accompanying during ANC visits have significant association with IFA consumption. This finding depicted that husband's knowledge regarding maternal health and their presence at the time of ANC encouraged their spouse to take IFA. Other studies by Chourasia et al[14] and Sinha KC et al[18] also reported same observations. Women having social mass media exposure have more consumption of IFA in comparison of those who don't have mass media exposure. Social mass media exposure is one of the good sources of information regarding health issues. Other studies by Chourasia et al[14]and Chimankar et al[15] reported that mass media campaigns helped pregnant women in proper utilization of health care services.

Calcium one of the important minerals following iron during pregnancy and lactation because of the potential outcome on maternal and fetal bone health especially when maternal calcium stores are exhausted. In present study only 23.5% women have taken adequate tablets of calcium during their pregnancy. Studies on calcium tablets consumption in India were not found in literature search. In present study less consumption of calcium during pregnancy might be due to lack of awareness about importance of calcium during pregnancy among women as well as field health workers. Study by Patrelli TS et al[19] and Hofmeyr GJ et al[20] reported that the calcium supplementation during pregnancy is an effective measure to reduce the incidence of preeclampsia, preterm birth, maternal deaths and serious morbidities especially in high-risk pregnancy. Present study revealed calcium consumption during pregnancy significantly associated with education status of women. Literacy is a proven known factor that influencing their autonomy and health seeking behaviour. In this study it was revealed that women who have multiple ANC visits and women whose husband present during antenatal visits significantly consuming more calcium tablets. However, there were no significant differences observed in calcium consumption with age, working status, education of husband, type of family, religion, pregnancy order, starting of first ANC and exposure to mass media.

CONCLUSION

The findings of the present study reveal the consumption of IFA tablets was higher than the national level. Calcium consumption was low in present study. Factors including literacy of pregnant women and her husband, joint family, birth order, received first antenatal visit in first trimester, 4 or more ANC visits, presence of husband during ANC visit and so-

cial mass media exposure were significantly associated with higher IFA consumption. Proportion of adequate Calcium tablets consumption was significantly higher in literate pregnant women, 4 or more ANC visits and presence of husband during ANC visit.

RECOMMENDATIONS

However, in present study most of the women took iron and folic acid tablets supplements during pregnancy but consumption of calcium was very low. There was a need to focus on high birth order, poor socio-economic status, uneducated women to create better health awareness regarding pregnancy related issues and increase utilization of available health services such as IFA and calcium supplements. Multiple ANC visits and presence of husband during ANC visits must be encourage to improve overall increase in supplementation. There is a need to increase focus on calcium supplementation by involvement of all type of stakeholders providing health care to pregnant women. Programs and guidelines for IFA and calcium supplement should be implemented effectively at all level to improve overall maternal and fetal health.

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