Original Article

COMPLIANCE TO IRON SUPPLEMENTATION AMONG PREGNANT WOMEN: A CROSS SECTIONAL STUDY IN URBAN SLUM

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ABSTRACT

Background: Noncompliance to the iron-folic acid tablets is one of the most important challenging factors in combating anaemia. The study was conducted to assess compliance to Iron folic acid supplementation in pregnancy and to study the factors affecting it.

Methods: The study included 239 pregnant women of gestational age 4th to 6th months from anganwadis of Surat Municipal Corporation area. Data was collected by personal interview with prestructured questionnaire. The data was analyzed using epi info software.

Results: The results show that compliance to iron pills is increases with increase in level of education, early registration, increase in number of antenatal visits and knowledge of haemoglobin status and iron pill dose. Women from nuclear family with less number of children have better compliance. The overall compliance was found to be 61.7%. Forgetfulness, ignorance toward self-health care and to visit health facility, big size of tablets and palatability, and frustration to take daily pills appears to main causes of non-compliance.

Conclusion: Every six out of ten pregnant women were found taking iron supplement pills. As number of antenatal visits and knowledge of dose and duration of iron supplementation pills are independently affecting compliance to iron pills, increasing number of antenatal visits and imparting knowledge about dose and duration of iron supplementation pills will improve compliance to iron pills.

Keywords: Compliance, Iron folic acid supplementation, Pregnant women

BACKGROUND

Anaemia is a global public health problem affecting nearly 2 billion people in both developing and developed countries with major consequences for human health as well as social and economic development[1]. It occurs at all stages of life cycle, but is more prevalent in pregnant woman and young and children[1]. Iron deficiency anaemia (IDA) was considered to be among the most important contributing factors to the global burden of disease[2]. Universal prenatal supplementation with iron-folic acid tablets is effective to prevent anaemia and iron deficiency at term[3]. There is a high prevalence of anaemia in pregnant women at India (58%)[1,4] in spite of iron supplementation program continuing for years[5]. Compliance is an important factor causing a failure in decrease of anaemia prevalence among pregnant women.[6,7,8] Compliance is defined as dose taking in relation to what was prescribed[9].

Compliance can be measured by direct or indirect methods. Direct methods includes haemoglobin, hematocrit, serum ferritin, stool test etc. which gives more accurate measures but the disadvantage is it involves a number of biochemical tests and are costly. Indirect measures included direct observation or supervision of pills, patient self-reporting, or counting the pills by health care provider. Among these direct measures pill count was found most accurate[10]. In this study compliance is measured by pill counting method considering intake of 80% or more as compliant.

Improving compliance is therefore, essential for prevention and control of anaemia and to make iron supplementation program successful[8]. Compliance is influenced by many socio-demographic factors[8,9,10] and knowledge about iron supplement[11]. This study was carried out to know the compliance to Iron folic acid supplementation in pregnancy and to study the factors affecting it among pregnant women of anganwadis in Surat city.

METHODS

The study was a cross-sectional qualitative study, consisting of interviews with a pretested questionnaire from December 2013 to March 2014 in randomly selected anganwadis one from each health centre area out of 36 Urban health centres present in Surat municipal corporation area. Anaemia status, haemoglobin level, time of antenatal registration and antenatal checkup details are taken from medical reports available from participants. The study subjects were explained about objectives of study in local language with clear words and informed verbal consent was taken from each of the subject regarding participation in study.

Compliance was defined as total number of tablets taken to the total number of tablets given multiplied by 100. Women taking 80% of given tablets are taken as satisfactory compliance[8]. Compliance to iron pills is calculated by the formula:

Compliance = number of tablets given- number of tablets remaining X 100 devided by number of tablets given

Data was collected by two methods – first by personal interview as well as looking for the empty iron tablet strips and second by checking the medical records. After complete formulation of methodology and research questionnaire, pilot testing was conducted in a randomly selected anganwadi for six pregnant women. Pretested structured questionnaire was used to record data after taking verbal consent.

The medical records were checked and data collected for date of registration, number of antenatal visits, obstetrical history and place of registration and haemoglobin levels. The number of iron pills given was counted by counting the total number of tablets given and total number of tablets taken was counted by deducting the number of tablets present in strips from the previous number.

Data entries were done in Microsoft Excel and collected data were analyzed using epi-info version software.

Definitions: Non-formal education[a] are women who are just literate or illiterate. Formal[b] education refers to women who are having primary education, secondary education or higher. Nuclear family[d] are families with husband, wife and his children and joint family[c] is having more members. Housewives[e] are women who don't earn and working[f] women are those who go out to earn money. Non-Vegetarian[g] women are taking food like chicken, meat, eggs etc. and vegetarians[h] not eating these kind of foods. Early registration[i] refers to registration of pregnant women within three months of pregnancy and late registration[j] is registration after three month of pregnancy. Government hospitals[k] are any of Urban health centre, or Government tertiary care centres and private hospitals[l] are hospitals owned by some person or trust.

RESULTS

The study included 239 pregnant women of gestational age fourth month to sixth month from selected 24 aganwadis of 24 different urban health center. The socio-demographic characteristics associated with compliance towards consumption of IFA pills is depicted in table 1. The mean age of study participant was (±SD) 23.4 ± 3.3. Majority of women were in the age category of 20 to 25 year age group. More than half of women under study had primary education. About one third of women participated were Muslim and two third were Hindu. About three forth of participants were from single family and about one forth families were joint family. Most of the participants were unemployed and housewives. Very few were workers doing works like housemaid, stitching, work associated

with handloom, Embroidery. About four fifth of participant were having only two children or less.

Table 1: Socio-demographic characteristic of the study participants

Socio-demographic factors	Frequency
Age	
<20 years	9(3.8)
≥20years	230(96.2)
Education	
Non-formal education[a]	73 (69.5)
Formal[b] education	166(30.5)
Religion	
Muslim	74(31.0)
Hindu	165(69.0)
Type of family	
Joint family[c]	61(25.6)
Nuclear family[d]	177(74.4)
Gravida	
>2 gravida	45(18.8)
≤ 2 gravida	194(81.2)
Occupation	
Housewife[e]	185(77.4)
Working[f]	54(22.6)

[a]Illiterate and just literate; [b]School education; [c]family with only wife husband and their children; [d]family with more members; [e]women not earning; [f] women with earnings.

The overall compliance towards consumption of IFA pills was 61.7%. As shown in table 2, literacy, religion and type of family are associated significantly (p=<0.05) to iron pill compliance. Women with higher level of education can better understand causes and consequences of anaemia and role of iron supplement. Women from single family found having better compliance may be because in joint family she may has to give more attention to other members as compared to herself. Compliance to iron pills is also significantly associated (p<0.05) to antenatal care factors like early registration, number of antenatal visits, pregnant women knowledge and awareness of anaemia status and iron supplementation dose. Women who are registered before three months of gestation get enough time to complete her iron supplementation course so they show a better compliance. Intake of non-vegetarian diet is not significantly associated with compliance. It may happen because the women may think that she taking a good diet and don't need iron supplement ("Shakti ni goli" as said in local language). Very few women exactly know about 100 day 100 tablet supplement course of iron pills as according to anaemia control program of government of India. Proper Knowledge about dose and duration of iron supplementation course have significant association to compliance to those pills. Knowledge of haemoglobin status and presence of anaemia is also associated with compliance

Table 2: Association of compliance to IFA tablets to its determinants among subjects: (n=239)

Variables	Compliance		P Value
	Non- compliant[1] (%)	Compliant[2] (%)	
Age			
<20 years	5(55.6)	4(44.4)	0.822#
≥20 years	119(51.7)	111(48.3)	
Religion			
Muslim	47(63.5)	27(36.5)	0.016*
Hindu	76(46.7)	88(53.3)	
Literacy			
Non formal eduaction	48(65.8)	25(34.2)	0.004*
Formal education	76(45.8)	90(54.2)	
Occupation			
Housewife	99(53.4)	86(46.6)	0.350
Working	25(46.3)	29(53.7)	
Type of family			
Joint family	43(69.4)	19(230.6)	0.001*
Nuclear family	81(45.8)	96(54.2)	
Gravida			
More than 2 gravida	30(66.7)	15(33.3)	0.028*
2 Gravida or less	94(48.5)	100(51.5)	
Spacing			
<3 years	68(56.7)	52(43.3)	0.308#
≥3 years	4(40.0)	6(60.0)	
Time of Registration			
Late Registration	45(66.2)	23(33.8)	0.005*
Early Registration	79(46.2)	92(53.8)	
Place of registration			
Govt. Hospital	90(53.6)	78(46.4)	0.422
Private institution	34(47.9)	37(52.1)	
No of ANC visits			
1 visit only	29(65.9)	15(34.1)	0.039*
>1 visits	95(48.7)	100(51.3)	
Anaemia			
Anaemia(Hb<11)	77(56.6)	59(43.4)	0.092
No Anaemia(Hb≥11)	47(45.6)	56(54.4)	
Knowledge of Hb status			
Donot know hb status	109(54.1)	89(45.9)	0.031*
Knows hb status	15(36.6)	26(63.4)	
Know dose of iron pills			
Yes	116(55.8)	92(44.2)	0.002*
No	8(25.8)	23(74.2)	

[1]women taking less than 80% of pills; [2]women taking 80% or more of pills provided; *The values are significant at p<0.05; # Fisher exact value

Table 3: Correlates to compliance to IFA tablets among subjects: stepwise multiple logistic regression (n=239)

Correlates of compliance	Crude OR(CI)	Adjusted OR(CI)	P-value*
Religion Hindu	1.989(1.132-3.495)	1.295(0.688-2.438)	0.424
Literacy Formal education	2.074(1.284-4.028)	2.038(1.096-3.790)	0.025
Family size Nuclear family	2.682(1.449-4.964)	2.193(1.114-4.315)	0.023
Gravida <2	2.128(1.077-4.203)	1.465(0.702-3.059)	0.309
Time of registration Early registration	2.278(1.269-4.092)	1.609(0.843-3.071)	0.149
ANC visits >1 visit	2.057(1,038-4.076)	2.035(1.027-4.032)	0.042
Know Hb	2.123(1.060-4.251)	1.747(0.808-3.777)	0.156
Know dose	3.625(1.550-8.479)	2.421(0.964-6.080)	0.056

*P value for adjusted OR

Table no 4: Causes of non-compliance

Variable	Frequency (%)
Forgetfulness	43(25.14)
Ignorance	39(22.80)
Big size	30(17.54)
Palatability	29(16.96)
Frustration with daily dose	17(9.94)
Cost	6(3.51)
Side effect	4(2.34)
Outmigration	3(1.75)

Further, the independent factors contributing towards compliance were included in the Multiple Regression analysis and depicted in Table 3. The variables included in regression analysis were religion, literacy, type of family, number of children or multigravidas, time of registration, number of ANC visits, knowledge of haemoglobin status and knowledge of dose of iron. It was found that literacy, being a member of nuclear family and more than one antenatal visit are independently associated with compliance to IFA tablets. Women with formal education are twice as much likely to be compliant to IFA tablets as women illiterate or just literate women. It also shows that women from a nuclear family are twice more likely to be compliant and women going for antenatal service for more than one time is twice more likely to be compliant to IFA tablets. Knowledge of dose of IFA pills had highest contribution towards the compliance.

Reasons for non-compliance: The most common reason for non-compliance was forgetfulness which was present in around one fourth of subjects. As in table no 4. Ignorance, bad taste, big size and palatability, frustration with many pills are the reasons present in significant number of subjects. Very few subjects described cost, side effects and outmigration as a reason for not taking pills.

DISCUSSION

Anaemia prevention programme is recently strengthened by Government of India with Iron plus guidelines with gains from NRHM and MOFHW and support of workers like ASHA, FHW and ANM. Pregnant women can get IFA tablets free of cost at all Government hospitals or through distribution by these workers during house to house visits. In spite of these efforts anaemia in pregnancy still stands as a major health problem. Compliance to IFA pills is an important factor determining anaemia status of the women.

In this study 61.7% of participants were found compliant to iron folic acid tablet supplement which is comparable to 74.9% in an Ethiopian study[11] and a study in South India in which compliance was 58.1%[12]. In another study in Senegal compliance to Iron pills found was 69%[13]. According to a study in Indonesia, 43% of the pregnant women who have claimed to have taken all iron tablets, the same can't be confirmed using stool tests[5]. In this study it was found that lower level of education, larger family norms like joint family, more than two children, registration after three months, a poor knowledge of haemoglobin status and dose of IFA pills result in poor compliance to IFA pills.

Looking for reasons for noncompliance, forget to take tablets and ignorance to self-health and to visit health facility stands as a major cause for noncompliance in 25.14% and 22.8% respectively. Forgetfulness was found to be 78.8 in another study of compliance to IFA in philippnes[14] and 48.8% in a South Indian study[12] which is lesser in this study may be because of better self-care. Forgetfulness can be prevented by supportive attitude of family members. Compliance can be improved by developing appropriate message and improving communication[2]. In Northeast Thailand a calendar was used to remind women

of importance of taking pills and to help them to keep track of the supplement they have provided[8]. Ignorance was present as to go to service provider for antenatal visit and laboratory reports which can be corrected by IEC activities, health education, training of grass root level health workers and their motivation and determination by service provider. It was present in 31.2% in a study in Gaza[15] which is comparable in this study. Bad taste and big size stands in 23.5% of women. Palatability was the cause of non-compliance to up to 41% in a study in Gaza which is lesser in this study may be because some of the participants were taking better preparations (syrup) prescribed by private practitioners. Big size of tablets and palatability issues can be corrected by using iron fortified food used in many foreign countries in anaemia prevention program or by supplying iron pills of reduced size and better taste in Government hospitals. 9.94% women experienced frustration with many pills which is similar to results of Galloway's study[16]. Side effect causes noncompliance in only 2.34% of women which is in accordance to Galloway's study in which side effects like nausea, vomiting caused non-compliance in very less number of women. Other studies support the notion that side effects affect compliance only minimally[8]. Outmigration and cost issues were very few and comparable to Galloway's study[16]. Among study subjects 28.5% women experience no problem in taking pills. Although adequate supply of iron pills was a major factor for non-compliance in the study including receipt of Iron supplement[17], here in this study, it is not considered because all the women under study was registered and provided iron pills.

CONCLUSION

The compliance towards iron supplementation pills is seen in every six out of ten pregnant women. The higher compliance level is seen in women who are educated and have better knowledge of exact dose of iron pills.

LIMITATION

The limitations of this study are inability to do test like stool test to confirm intake of iron pills, which can give a better measure of compliance. Some of the factors such as deficient supply of iron pills and provider compliance is not taken into consideration in this study.

RECOMMENDATIONS

The health care providers and the pregnant women must be aware of importance of non-compliance and the factors affecting it. In this study it was found that a knowledge of dose of iron supplementation most important factor among the determinants of compliance. Therefore increasing awareness about iron supplementation dose and duration, health education can improve their compliance towards iron supplementation and as a result, improved haemoglobin status in them, decrease in prevalence of anaemia.

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