SOCIO DEMOGRAPHIC DETERMINANTS OF IFA INTAKE DURING PREGNANCY AMONG MOTHERS IN RURAL AREA OF ROHTAK, HARYANA, INDIA

*Sangwan K.[1], Kumar N.[2], Jindal H.A.[1], Jitendra[3], Bhatt B.[1] Sahoo S.S. and Kamboj G.
[1]*Departmet of Community Medicine PGIMS Rohtak*
[2]*Department of Community Medicine PGIMS Rohtak*
[3]*MO Bharatpur, Rajasthan*
*Author for Correspondence

ABSTRACT

Anemia is the most common disease and one of the leading causes of adverse maternal and fetal outcomes during pregnancies. The WHO estimates that 58% of the women in developing countries are anaemic (Allen, 2000). In some parts of India, its prevalence may be as high as 88%. A cross sectional study was carried out among mothers having children within 1-3 months of age in a rural area from October 2013 to November 2014. Twenty subcenters from Rohtak were selected by multistage random sampling. A list of all mothers having babies 1-3 months of age group was obtained from ANC, Natal, Postnatal, Birth and Immunization register at time of first visit to the subcenter. All these females were contacted by house to house visit by interviewer and data collected. The present study included 349 subjects with most of women below 25 yrs (67.6%) and thirty percent women were illiterate/ primary level. More than half study subjects were from joint families. Only 50% women do three ANC visits. Most women do 2 ANC visits (49.3%). Nearly all women are anaemic mostly having moderate anemia (60.5%). Anemia is a common cause of morbidity among pregnant women. IFA tablets take them out of the clutches of this disease. The compliance level is directly influenced by the age, education, socioeconomic status, parity and no of ANC visits. Hence various interventions such as improvement in the education status of the women though health education, SES, and improvising the health care delivery system for appropriate ANC may improve anemia in the beneficiary of IFA.

Keywords: Iron Folic Acid, Anemia, Pregnant, Women, Complaince

INTRODUCTION

Anemia is the most common disease and one of the leading causes of adverse maternal and foetal outcomes during pregnancies (WHO, 2001). The World Health Organization (WHO) defines anemia as blood hemoglobin concentration less than 11gm/dl. Anemia especially if severe is directly or indirectly responsible for 40% of maternal deaths (Galloway, 2002). It is estimated that as many as 20% of maternal deaths are directly caused by anemia through its complications and it is an associated cause in as many as 50% of maternal deaths worldwide (ICMR, 1989).

The WHO estimates that 58% of the women in developing countries are anaemic (WHO, 2001). In some parts of India, its prevalence may be as high as 88% (Bhatt, 1997). The prevalence of anemia among pregnant women in rural area of Rohtak district of Haryana State in India is 62.6% (IIPS, 2014).

Iron is required for hemoglobin synthesis and during pregnancy there is an increase in the requirement for a healthy outcome of mother and fetus, which does not, fulfilled by the regular diet. This may get worsened by the loss of appetite during pregnancy (ICMR, 1989). Therefore the most suitable mass intervention for iron supplementation is administering iron along with Folic acid in the form of tablets to pregnant women aiming at increasing the hemoglobin concentration, so that the level of anemia at term could be reduced to the best possible extent (Allen, 2000; Scholl, 2000).

In most of developing countries Health Ministries formulate and implement policies to give pregnant women either iron by itself or combined with folic acid in tablet form (IFA tablets). The National protocols in India, as prophylaxis, proposes one tablet containing 100 mg elemental iron and 0.5 mg folic

Research Article

acid for daily consumption to all women during pregnancy for 100 days as a part of Safe Motherhood program to combat this threat.

But effectiveness and success of such interventions depends on the compliance of the Iron folic acid tablets. Compliance describes the degree to which a patient correctly follows a medical advice. Many experts believe that one of the main reasons that national iron supplementation programs have failed is women's "noncompliance" (WHO, 2001; Allen, 2000). There are factors including health system and patient factors which determine the compliance, which are not studied extensively (Allen, 2000; Scholl, 2000).

In spite of all the efforts, the available literatures suggest a gloomy scenario of maternal health care in the country, in terms of IFA tablet consumption (IIPS, 2007; Bhat, 2003). Only 23% women consumed iron tablets for at least 90 days during pregnancy, says a report (IIPS, 2007). Limited adherence to the therapy is denying the success of the supplementation program, a scenario common in other developing countries, mostly due to side effects and lack of motivation (Lacerte, 2011; Khan, 2010; WHO, 2001; Hyder, 2002). Considering adherence as a vital issue in the success of iron supplementation program, the study aimed to find out the socio-economic determinants of consumption of 100 IFA tablets in rural areas of District Rohtak Haryana, in north India.

MATERIALS AND METHODS
This was a cross sectional study, carried out among mothers having children within 1-3 months of age in a rural area of district Rohtak, Haryana for one year i.e. from October 2013 to November 2014. Twenty subcenters from Rohtak were selected by multistage random sampling.

Sample Size Calculation: As per birth rate of India 21.8 (SRS Bulletin October 2012), sample size of mothers having babies between 1-3 months was calculated to be 360 for all 20 subcenters (SRS Bulletin, 2012).

Out of this only 349 mothers could be contacted .Subjects who were not willing and who could not be contacted after three visits were excluded from study.

Data Collection
A list of all mothers having babies 1-3 months of age group was obtained from ANC, Natal, Postnatal, Birth and Immunization register at time of first visit to the subcenter. All these females were contacted by house to house visit by interviewer and data collected by interview technique using predesigned, pretested, semi-structured schedule after taking informed verbal consent.

Tools of Data Collection: The study was conducted after permission from Civil Surgeon of District Rohtak and Institutional ethical committee

For calculating socio-economic status, modified Pareek's classification for rural area was used (Couillet, 2007).

The main outcome variable was consumption of 100 IFA tablets. Among different independent variables, age, education, socio-economic status (SES), family type, parity, timing of ante-natal registration and number of ante-natal care (ANC) visits to health facility were included.

Statistical Analysis: Data entry and analysis were done using SPSS for Windows software (Version 20.0; SPSS Inc, IL, Chicago, US). The chi-square test was used to compare the mothers who had consumed 100 IFA tablets and who had not. A p value of < 0.05 was considered statistically significant.

RESULTS AND DISCUSSION
Results
The demographic characteristics of the subjects are summarized in Table 1. The present study included 349 subjects with most of women below 25 yrs (67.6%) and thirty percent women were illiterate/ primary level. More than half study subjects were from joint families.

According to modified B.G. Prasad's Classification (Lacerte *et al.,* 2011) majority 180 (51.6%) belonged to Upper lower class followed by 136 (39%) belonged to lower middle class. Most women had single followed by two babies.

Research Article

Table 1: Distribution of Study Participants according to Socio-demographic profile

Socio demographic profile		Frequency	Percent
Age (years)	<25	236	67.6
	25-30	95	27.2
	30-35	15	4.3
	>35	3	.9
	Total	349	100.0
Education	Illitrate	48	13.8
	Primary	58	16.6
	Middle	91	26.1
	High	102	29.2
	Secondary	48	13.8
	Graduate	2	.6
	Total	349	100.0
Socioeconomic status	Class II	12	3.4
	Class III	136	39.0
	Class IV	180	51.6
	Class V	21	6.0
	Total	349	100.0
family type	Nuclear	60	17.2
	Joint	256	73.4
	Three Generation	33	9.5
	Total	349	100.0
Parity	0	2	.6
	1	145	41.5
	2	134	38.4
	3	49	14.0
	4	11	3.2
	5	6	1.7
	6	2	.6
	Total	349	100.0

As revealed by Table 2 , 57.6% registrations occur in second trimester. Only 50% women do three ANC visits. Most women do 2 ANC visits (49.3%). Nearly all women are anaemic mostly having moderate anemia (60.5%).

Research Article

Table 2: Distribution of participants according to availment of ANC care

ANC Data		Frequency	Percentage
Early Registration	Yes	148	42.4
	No	201	57.6
	Total	349	100.0
3 ANC visits	Yes	168	49.6
	No	181	50.4
	Total	349	100.0
Number of ANC visits	0	3	.9
	1	7	2.0
	2	172	49.3
	3	73	20.9
	4	76	21.8
	5	18	5.1
	Total	349	100.0
Hemoglobin (gm/dl)	<7	30	8.6
	7-9	211	60.5
	9-11	94	26.9
	>11	14	4.0
	Total	349	100.0

The comparison between the profiles of the mothers who took 100 tablets and who did not, revealed significant difference in terms of age, education, SES, parity, early registration and number of ANC visits and hemoglobin at first visit. The association of all variables with intake of IFA is shown in Table 3.

At more age fewer females are taking IFA. And this is statistically significant. Education is also showing impact on IFA intake, more the female is educated more is iron intake compliance and this is also significant. Similarly parity, early registration and three ANC Visits show a statistically significant association with IFA intake. Family type has no statistically significant impact on IFA intake.

Research Article

Table 3: Association of Variables with IFA intake

		100 IFA		Total
		No	**Yes**	
Age	<25	65	171	236
	25-30	42	53	95
	30-35	4	11	15
	>35	1	2	3
χ^2=9.613 df 4 p=.047	Total	112	237	349
Education	Illiterate	22	26	48
	Primary	24	34	58
	Middle	24	67	91
	Secondary	25	77	102
	Sr. secondary	16	32	48
	Graduate	1	1	2
χ^2=10.89 df 5 p=.05	Total	112	237	349
Socio	Class II	6	6	12
economic status	Class III	79	57	136
	Class IV	105	75	180
	Class V	6	15	21
χ^2=21.6 df 12 p=.042	Total	192	153	349
Early Registration	0	0	1	1
	1	35	112	147
	2	77	124	201
χ^2=8.664 df 2 p=.013	Total	112	237	349
Parity	0	1	1	2
	1	28	117	145
	2	50	84	134
	3	25	24	49
	4	5	6	11
	5	2	4	6
	6	1	1	2
χ^2=22.09 df 6 p=.001	Total	112	237	349

Research Article

ANC Visits	0	0	1	1
	1	5	2	7
	2	104	69	173
	3	37	36	73
	4	39	37	76
	5	10	6	16
	7	1	2	3
χ^2=40.45 df 24 p=.019	Total	196	150	349
Family type	Nuclear	21	39	60
	Joint	79	177	256
	Three generation	12	21	33
χ^2= 0.750 df 3 p=.86	Total	112	237	349
Hemoglobin	1	14	16	30
at 1st ANC Visit	2	70	141	211
	3	20	74	94
	4	8	4	12
	5	0	2	2
χ^2=15.611 df= 4 p=.004	Total	112	237	349

Discussion
Ours study shows the association of age, education, socio-economic status, parity, early registration and number of ANC visits with IFA intake. In a similar study by Manas *et al.,* (2013) influence of education, parity, timing of registration and number of ANC visits was found significantly associated with IFA intake whereas age, SES or family type was not significantly associated (Manas *et al.,* 2013). In another study by Mithra *et al.,* (2013) SES, age, parity are major contributors towards IFA compliance. In their study compliance was 64.7% which is somewhat similar to our findings i.e. 67.9% (Mithra *et al.,* 2013).
Our study found out of 349 subjects, 237 (67.9%) consumed 100 IFA tablets for 3 months which is also comparable to a study conducted in Senegal in 2008 (Seck, 2008). Also our study observed that there are direct and indirect factors affecting the compliance levels. Those women, who are anaemic, had lesser level of compliance and the women who were above 25, and had second pregnancy were more compliant when compared to others. One study found the number of ante-natal visits to be a determinant of adherence to iron supplementation. Our study also has similar findings (Demographic Mangalore, 2012).
Poor compliance about iron tablet consumption were revealed by a few studies earlier although none of them had addressed the socio-economic aspects (IIPHS, 2007; Bhat, 2003; Govt. of U.P., 2005-07; Singh, 2008; Kotecha, 2009).
Among different socio-economic factors, multiparity has earlier been linked with maternal anemia (Khan, 2010; Sohail, 2004).
Our study finding that multipara mothers were less likely to consume sufficient IFA tablets supports that hypothesis. Previous studies also found fewer tendencies among multipara to consume this supplementation (Ogundipe, 2012; Knudsen, 2007).

Research Article

This study is very similar to a study conducted among recently delivered group of women in Lucknow by Manas (2010), that significant relation in terms of education, parity, timing of registration and number of ANC visits exist with intake of IFA tablets (Lacerte *et al.,* 2011). This however needs further evaluation to determine the temporality of association. The present study area reflects a literate population and a prospectively developing region. Despite that there are factors which hinder the compliance of IFA tablets during pregnancy. These socio demographic factors influencing the compliance with IFA tablets and thus determining the anemia status could still be more and adverse in the other parts of the country where, literacy rates and health care delivery system are yet to reach the desired target (Lacerte, 2011).

Limitations

The cross sectional nature of the study does not include reasons of non compliance. There were also chances of recall bias among the study subjects regarding of IFA intake.

Conclusion

Anemia is a common cause of morbidity among pregnant women. IFA tablets take them out of the clutches of this disease. The compliance level is directly influenced by the age, education, socioeconomic status, parity and no of ANC visits. Hence various interventions such as improvement in the education status of the women though health education, SES, and improvising the health care delivery system for appropriate ANC may improve anemia in the beneficiary of IFA. During Antenatal visits, the significance of IFA tablets should be repeatedly explained and enforced on. Health education sessions should be conducted for pregnant mothers on regular basis and the same implementation has to be percolated to all cadres of health service providers.

REFERENCES

Allen LH (2000). Anaemia and iron deficiency. Effects on pregnancy outcome. *American Journal Clinical Nutrition* **71**(suppl) 1288S–94S.

Bhat IA (2003). Assessment of antenatal and postnatal care in Budgam district. Population Research Centre, Srinagar

Bhatt RV (1997). Maternal Mortality in India. FOGSI, WHO study? *Journal of Obstetrics & Gynecology of India* **47** 201-14.

Couillet M, Serhier Z, Tachfouti N, Elrhazi K, Nejjari C and Perez F (2007). The use of antenatal services in health centres of Fes, Morocco. *Journal of Obstetrics Gynaecology* **27** 688-94

Galloway R, Dusch E, Elder L, Achadi E, Grajeda R and Hurtado E *et al.,* (2002). Women's perceptions of iron deficiency and anaemia prevention and control in eight developing countries. *Social Science & Medicine* **55**(4) 529–44.

Govt. of U.P. Baseline Facts-Uttar Pradesh (2005-07). Concurrent Assessment and Technical Assistance to districts. Family Welfare Directorate, Govt. of U.P. Available: www.njcmindia.org, pISSN 0976 3325, eISSN 2229 6816, *National Journal of Community Medicine* **4**(3) 391.

Hyder SMZ, Persson LA, Chowdhury AMR and Ekstrom EC (2002). Do side-effects reduce compliance to iron supplementation? A study of daily- and weekly-dose regimens in pregnancy. *Journal of Health Population Nutrition* **20**(2) 175-9.

ICMR (1989). Evaluation of National Nutritional Anaemia Prophalaxis Programme. An ICMR Task Study, ICMR New Delhi.

International Institute for Population Sciences (IIPS) 2014 (2012). District Level Household and Facility Survey (DLHS 4), District Fact Sheet, Rohtak, Haryana, 2012-13: Mumbai IIPS 04.

International Institute for Population Sciences (IIPS) and Macro International (2007). *National Family Health Survey (NFHS-3)* 2005–06, India**,** Mumbai: IIPS **I**.

Khan DA, Fatima S, Imran R and Khan FA (2010). Iron, folate and cobalamin deficiency in anemic pregnant females in tertiary care centre at Rawalpindi. *Journal of Ayub Medical College Abbottabad* **22**(1) 17-21.

Knudsen VK, Hansen HS, Ovesen L, Mikkelsen TB and Olsen SF (2007). Iron supplement use among Danish pregnant women. *Public Health Nutrition* **10** 1104–10.

Research Article

Kotecha PV (2009). Maternal health services – quality of care: Uttar Pradesh scenario anemia control as a context. Solution exchange for MCH community, News Letter Safe Motherhood special April.

Lacerte P, Pradipasen M, Temcharoen P, Imamee N and Vorapongsathorn T (2011). Determinants of adherence to iron/folate supplementation during pregnancy in two provinces in cambodia. *Asia Pacific Journal of Public Health* **23**(3) 315-23.

Manas P Roy, Uday Mohan, Shivendra Kumar Singh, Vijay Kumar Singh and Anand Kumar Srivastava (2013). Socio-Economic Determinants of Adherence to Iron and Folic Acid Tablets among Rural Ante-natal Mothers in Lucknow, India, *National Journal of Community Medicine* **4**(3) 386-39.

Mithra P (2013). Demographic Details of Mangalore and Other Parts of India. Available from URL http://censusindia.gov.in/2011-Common/ ahsurvey.html (Accessed on 10-09-2012).

Mithra P, Unnikrishnan B, Rekha T, Nithin K, Mohan K, Kulkarni V, Kulkarni V and Agarwal D (2013). Compliance with iron-folic acid (IFA) therapy among pregnant women in an urban area of south India. *African Health Sciences* **13**(4) 880 – 885.

Office of Registrar General & Census Commissioner (2012). SRS Bulletin 2012. Ministry of Home Affairs, GoI.

Ogundipe O, Hoyo C, Østbye T, Oneko O, Manongi R and Lie RT *et al.,* (2012). Factors associated with prenatal folic acid and iron supplementation among 21,889 pregnant women in Northern Tanzania: a cross-sectional hospitalbased study. *BMC Public Health* **12** 481.

Scholl OT and Johnson WG (2000). Folic acid. Influence on the outcome of pregnancy. *American Journal of Clinical Nutrition* **71**(suppl) 1295S–303S.

Seck BC and Jackson RT (2008). Determinants of compliance with iron supplementation among pregnant women in Senegal. *Public Health Nutrition* [Internet] **11**(6) 596–605, Available: http://www.ncbi.nlm.nih.gov/pubmed/17764606 (Accessed on 1-2-2013).

Singh MK (2008). A study on utilization of asha under nrhm in maternal and neonatal health services in rural Lucknow [MD thesis] CSM Medical University UP, Lucknow.

Sohail R, Zainab S and Zainab F (2004). Prevalence of anemia in obstetrical population. *Annals of King Edward Medical College* **10**(2) 146-8.

WHO (2001). Iron deficiency anemia: assessment, prevention and control – a guide for programme managers. Geneva: World Health Organization.