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Study of Iron Folic Acid Supplementation Program in the Field Practice Area of RIMS Medical College, Kadapa

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Abstract

Surveys in different parts of India indicate that about 50 to 60 per cent of women belonging to low socio-economic groups are anemic in the last trimester of pregnancy. The major etiological factors are iron and folic acid deficiencies. The Government of India has initiated a program in which 100 mg of elemental Iron and 500 mcg of folic acid are being distributed daily to pregnant women through antenatal clinics, primary health centers and their sub centers. The current study is intended to study the effectiveness of the iron supplementation program in the field practice areas of RIMS medical college. Baseline data of antenatal cases is recorded with the help of a pre-tested questionnaire. Their blood samples are collected on the date of registration and analyzed for hemoglobin concentration by cyan meth hemoglobin method. First pack of IFA containing 30 tablets is given to the subject along with administration instructions. These steps are repeated on subsequent antenatal visits at 20, 32 and 36 weeks of pregnancy as per norms. During these subsequent visits hemoglobin concentrations are measured and compliance for IFA supplementation is enquired. A total of 1196 registered ANCs were taken into study of which only 598 could be followed till the outcome of pregnancy. The mean age was 23.6 yrs with SD 2.97. Majority (40.07%) of the women were second gravida and primipara. Mean Hemoglobin values varied significantly with the literacy status of women. Mean Hemoglobin values varied significantly at every visit with supplementation of IFA. All the women receiving IFA supplementation did not have adequate hemoglobin levels at the time of delivery.

Key words: Anaemia, Antenatal, Iron, Folic Acid

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Introduction

A WHO expert group proposed that anemia should be considered to exist when hemoglobin is below 11 g/dl of venous blood in adult female pregnant. Surveys in different parts of India indicate that about 50 to 60 per cent of women belonging to low socio-economic groups are anemic in the last trimester of pregnancy. The major etiological factors being iron and folic acid deficiencies. Anemia per se is associated with high incidence of premature births, post partum hemorrhage, puerperal sepsis and thromboembolic phenomenon in the mother. The Government of India has initiated a program in which 100 mg of elemental Iron and 500 mcg of folic acid are being distributed daily to pregnant women through antenatal clinics, primary health centers and their sub centers.

The field practice area of Rajivgandhi Institute of Medical Sciences (RIMS) medical college has one urban health center at Akkayapalli, Kadapa

and one rural health center at Chennur. Auxiliary Nurse and Midwifes (ANMs) at these centers carry out registration of pregnant women with the help of anganwadi staff and Accredited social health activist (ASHA) workers in their respective sub centers. A minimum of four antenatal visits are paid by the ANM and distribute iron folic acid tablets to these pregnant women.

Materials and methods

The current study is intended to study the effectiveness of the iron supplementation program in the field practice areas of RIMS medical college. By assessing the hemoglobin levels of the pregnant women at the time of registration and at subsequent antenatal visits after supplying Iron and Folic Acid (IFA) tablets and at 1 week before Expected Date of Delivery (EDD) the effectiveness of IFA supplementation can be assessed. Also by following the pregnant women till the outcome of pregnancy the usefulness and the requirement of IFA supplementation can be inferred.

Study subjects are pregnant women registered in the Health centers. Study area includes Urban Health Center (UHC) and Rural Health Center (RHC) attached to RIMS medical college, Kadapa. All the antenatal cases registered during the study period are included in the study without opting for sample. Study period is for one complete year. Antenatal cases moving out and moving into the area of study during the study period are excluded out of the study.

All the pregnant women registered during the study period at the UHC and RHC under RIMS medical college, Kadapa are taken into the study. Baseline data of antenatal cases is recorded with the help of a pre-tested questionnaire. Their blood samples are collected on the date of registration and analyzed for hemoglobin concentration by cyan meth hemoglobin method. Those found to be anemic are analyzed for the type of anemia by peripheral smear examination. First pack of IFA containing 30 tablets is given to the subject along with administration instructions. These steps are repeated on subsequent antenatal visits at 20, 32 and 36 weeks of pregnancy as per norms. During these subsequent visits hemoglobin concentrations are measured and compliance for IFA supplementation is enquired.

These women are followed up till the outcome of pregnancy. After delivery of the child the health status of mother and child are assessed. The data thus obtained is subject to analysis for the effectiveness of IFA supplementation on the hemoglobin concentration and the outcome of pregnancy.

Results

A total of 1196 registered Antenatal cases (ANCs) were taken into study of which only 897 could be followed till the outcome of pregnancy. The minimum age was 18 yrs and maximum 38 yrs with 25 yrs as the most common age (17.7%). The mean age was 23.6 yrs with SD 2.97. Majority (43.8%) of the women belonged to O.C community and the least to Scheduled Tribes (2.3%) (table 2). 92 % of the families of the antenatal women were below the poverty Line (table 3). 41.5% are illiterate with only 0.7% with post graduate qualification (table 4). Majority (40.07%) of the women were second gravida and Primipara. Only 0.68% was grand multipara (table 5). With supplementation of IFA the Hemoglobin status of antenatal women has improved with every supplementation as shown in table 6.

Table 1: Age wise distribution of Antenatal women

Age group (yrs)	Frequency
≤19	24 (2.7%)
20-30	855 (95.3%)
31-40	18 (2%)
Total	897 (100%)

Table 2: Community of Antenatal women

Community	Frequency
Scheduled castes	234 (26.1%)
Scheduled Tribes	21 (2.3%)
Backward Classes	249 (27.8%)
Other classes	393 (43.8%)
Total	897 (100%)

Table 3: Annual family income of Antenatal women

Annual family Income	Frequency
Above poverty line	72 (8%)
Below poverty line	825 (92%)
Total	897 (100%)

Table 4: Literacy status of Antenatal women

Literacy status	Frequency
Illiterate	372 (41.5%)
Primary	183 (20.4%)
Middle	30 (3.3%)
High school	216 (24.1%)
Intermediate	48 (5.4%)
Degree	42 (4.7%)
Post graduate	6 (0.7%)
Total	897 (100%)

When the blood samples of anemic women were subjected to analysis for type of anemia most common type of anemia was due to iron deficiency and the least common type is Megaloblastic (table 7). Out of all the risk factors complicating pregnancy most common risk factor complicating their pregnancy is anemia (table 8). Of the 897 women followed till the outcome of pregnancy 6.5% pregnancies were aborted and 2.8% pregnancies resulted in still births with 90.7% of the pregnancies resulted in live births (table 9). Of the 839 deliveries conducted 95.1% of the deliveries were conducted in institutions (table 10). 3% of the babies born are low birth weight with no baby above 4 kg of weight (table 11).

Mean Hemoglobin values at the time of registration did not vary significantly in respect to their age groups, community, economic status, gravid status and parity of pregnancy. Mean Hemoglobin values at the time of registration varied significantly with the literacy status of women with lowest levels in highly educated women (table 12). Mean Hemoglobin values varied significantly at every visit with supplementation of IFA (table 13). Mean Hemoglobin values did not vary significantly with the outcome of pregnancy. Mean Hemoglobin values of antenatal women at registration or at 1 week prior to EDD did not vary significantly with the birth weight of the baby.

Table 5: Past obstetric history of Antenatal women

	NulliPara	Primipara	Second para	Third para	Fourth para	Fifth para
Primi gravida	320 (35.69%)	-	-	-	-	-
Second gravida	24 (2.69%)	359 (40.07%)	-	-	-	-
Third gravida	-	-	157 (17.51%)	-	-	-
Fourth gravida	-	-	3 (0.34%)	27 (3%)	-	-
Fifth gravida	-	-	-	-	3 (0.34%)	-
Sixth gravida	-	-	-	-	-	**3 (0.34%)**
Total	**344 (38.38%)**	**359 (40.07%)**	**160 (17.85%)**	**27 (3.00%)**	**3 (0.34%)**	**3 (0.34%)**

Table 6: Hemoglobin levels of Antenatal women (as percentages) at different visits

Hemoglobin concentration	1st visit	2nd visit	3rd visit	4th visit
Normal	2	8	20.1	27.3
Mild Anemia	37.9	57.2	63.8	63.7
Moderate Anemia	50.7	34.8	16.3	9.1
Severe Anemia	9.4	1	0	0
Total	**100**	**100**	**100**	**100**

Table 7: Type of anemia in Antenatal women

Type of anemia	Frequency
Iron deficiency	**65%**
Dimorphic	**19%**
Hemolytic	**11%**
Megaloblastic	**5%**
Total	**100%**

Table 8: Pregnancy risk in Antenatal women

Pregnancy risk	frequency
Elderly primi	12 (1.35%)
Short statured primi	6 (0.68%)
Anemia	879 (98%)
Bad obstetric history	6 (0.7%)
Elderly grandmultipara	6 (0.7%)
Previous caesarean	249 (27.8%)
Medical conditions	4 (0.4%)

Table 9: Pregnancy outcome of Antenatal women

Pregnancy outcome	Frequency
Abortion	**58 (6.5%)**
Still births	**25 (2.8%)**
Live births	**814 (90.7%)**
Total	**897 (100%)**

Table 10: Place of delivery of Antenatal women

Place of delivery	Frequency
Home	41 (4.9%)
Institution	798 (95.1%)
Total	839 (100%)

Table 11: Birth weight of new born infants

Birth weight	Frequency
≤ 2.5 kg (LBW)	24 (3%)
2.6 – 4 kg	790 (97%)
Total	814 (100%)

Table 12: Literacy status and mean hemoglobin levels

Literacy	Mean Hemoglobin	Standard Deviation
Illiterate	8.65	1.29
Primary	8.57	1.20
Middle	8.40	0.83
High school	8.03	1.27
Intermediate	8.15	1.16
Degree	8.23	1.01
Post graduate	**7.25**	0.35

Table 13: Mean hemoglobin levels at antenatal visits

Visits	Mean Hemoglobin	Variance
First	8.42	1.52
Second	9.10	1.25
Third	9.66	1.26
Fourth	9.91	1.14

Discussion

There were many dropouts from the study as many pregnant women moved to their maternal home for delivery. As normally observed there were few pregnancies below 19 years of age and above 30 years of age and majority from the 20 to 30 age group. As the UHC served urban slums the scheduled castes are more and also these people depend on government services even in rural areas. Because of lack of accessibility to private health services and presence of poor people in other classes their

population is also more. These could be the reasons for very high percentage of below poverty line population in the study. Majority of the women were illiterate and the people with higher education decreasing gradually with minimum number of post graduates. Majority of the women were second gravida and primipara followed by primigravida. Multi gravid pregnancies were minimal. At the time of registration majority of the women were moderately anemic followed by mild and severely anemic women and very few normal women. As the pregnancy proceeded and with IFA supplementation the anemic status gradually improved with every visit and at the end of the study majority of the women reached mild anemic state followed by normal women and only a few moderately anemic women. No severely anemic women were present by the time of delivery. The difference observed in hemoglobin status at each visit was highly significant ($p<0.001$).

Peripheral smear was collected from all the anemic pregnant women at the first contact to identify the type of anemia. The results showed that majority were iron deficiency anemic with hypochromic and microcytic picture followed by dimorphic anemia where a picture of microcytic and megaloblastic anemia is seen. Some of the anemics were having hemolytic picture and the probable cause as mentioned in many published studies could be because of thalassemic trait. Only a minority of women were purely megaloblastic. This indicates that majority of the women suffered with iron deficiency anemia followed by mixed deficiency of iron, folic acid and or vitamin B12.

The most common risk complicating pregnancy from different published studies also turned out to be anemia. Also the second common risk is a history of previous caesarian section which clearly reflects the observation made by WHO of unnecessary caesarian sections in India. Majority of the pregnancies resulted in live births due to the availability of proper antenatal care and IFA supplementation. A minor of the cases resulted in abortions the cause for which could not be established. More than 95% of the deliveries were institutional in nature. Only a few births were Low Birth Weight (LBW) babies while the majority children were of normal weight.

Mean hemoglobin values at the time of registration did not vary significantly in respect to the age group, community, annual family income, and gravid status, and parity, outcome of pregnancy and birth weight of the baby. The birth weight of the baby was not dependent on the mean hemoglobin levels at the time of registration or at the time of delivery. The mean hemoglobin levels were poor in post graduate degree holders than any other group and the difference is statistically significant which cannot be explained.

Conclusion

Majority of the women were in the 20-30 years age group, belonged to the scheduled castes community, from Below poverty line families and illiterate in their second gravida and primipara. At the time of registration majority of the women were moderately anemic majorly due to iron deficiency with anemia as the most common risk complicating pregnancy. Mean hemoglobin values at the time of registration did not vary significantly in respect to the age group, community, annual family income, gravid status, parity, outcome of pregnancy and birth weight of the baby. Majority of the deliveries were institutional resulting in high live birth and normal birth weight rates. Mean hemoglobin values at every visit varied significantly due to IFA supplementation. The birth weight of the baby did not dependent on the mean hemoglobin levels at the time of registration or at the time of delivery. All the women receiving IFA supplementation did not have adequate hemoglobin levels at the time of delivery and majority were mildly anemic.

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