

Research Article

Anaemia in pregnant mothers attending antenatal clinic at primary health centre, Devarayasamudra, Kolar, Karnataka, India

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ABSTRACT

Background: Anaemia in pregnancy continues to be a problem inspite of national programs for its prevention and control. It is an important factor in maternal morbidity and mortality. Nutrition education during pregnancy and the consumption and supply of iron and folic acid tablets is still not universal as envisaged in the RCH programme. The objectives of the study were to study the prevalence of anaemia among pregnant mothers attending antenatal clinic and to study the knowledge and practices regarding prevention of anaemia in pregnant mothers.

Methods: A cross sectional study was conducted at PHC Devarayasamudra on 50 pregnant women attending antenatal clinic. A pre tested questionnaire was applied to know the utilization and delivery of ANC services. Hemoglobin estimation was done by using Sahli's method. A focused group discussion was conducted to find the knowledge and practices regarding anaemia and its prevention.

Results: The mean age of pregnant women in the study is 22 years and 6% were below 18 years. Primi constituted to 40%. 60% had at least one child. At least one home visit by ANM was made in all of the women. 54% of the women received IFA tablets from PHC and 10% were given prescription for IFA and 40% of the women never consumed it. Only 46% of women had ever used any temporary family planning method. 70% of women did not use sanitary latrine and 14% of them did not wear footwear during open field defecation. 64% of the women had anemia. About 52% of the women had no knowledge on the importance of consuming iron rich nutritious diet during pregnancy.

Conclusions: Anaemia in pregnancy continues to be a problem. The delivery of services to prevent and control anaemia is not as expected under RCH programme. The knowledge of the pregnant mothers regarding anaemia and its prevention is poor.

Keywords: Anaemia, Pregnant women, Iron deficiency, Iron supplementation, Prematurity

INTRODUCTION

Anaemia during pregnancy is a global public health challenge facing the world today, especially in developing countries.¹ It is an important factor in maternal morbidity and mortality. Maternal anaemia is associated with poor intrauterine growth and increased risk of preterm births and low birth weight rates.² Most of the studies have reported this problem to be of high magnitude especially in developing countries.

WHO has estimated that prevalence of anaemia in pregnant women is 14% in developed and 51% in the developing countries and 65 – 75% in India.³ Prevalence of anaemia in South Asian countries is among the highest in the world. India contributes to about 80% of the maternal deaths due to anaemia in South Asia.⁴ The prevalence rates are dependent of the food habits, life style and socio economic conditions prevailing.

Iron deficiency is the most prevalent cause of anaemia and most of it is preventable by iron supplementation and correcting other micro nutrient deficiency.⁵ Other causes of anaemia in developing countries are hook worm infestation, malaria, tuberculosis and HIV. In developed countries inflammatory bowel disease, malignancies and malnutrition play an important role.

The definition of anaemia is based on hemoglobin value. According to the World Health Organization (WHO), anaemia in pregnancy is defined as hemoglobin concentration of less than 110g/L.⁶ Anaemia ranges from mild (10.0-10.9g/dl), moderate (7-9.9g/dl) to severe (<7g/dl).⁷ There is 8 to 10 fold increase in maternal mortality rate (MMR) when hemoglobin falls below 5g/dl.⁸

Early detection and effective management of anaemia in pregnancy can contribute substantially to reduction in maternal morbidity/mortality and improve the perinatal outcome. Successful management of anaemia in pregnancy depends on accurate and acceptable methods of detecting anemia, assessing its severity and monitoring response to treatment.⁹

The objective of this study is to know the prevalence of anaemia among pregnant women attending antenatal clinic and their knowledge and practices regarding prevention of anemia.

METHODS

A community based cross sectional study was conducted in December 2011 at Primary health centre, Devarayasamudra, Kolar district. The study population consisted of 50 pregnant women attending antenatal clinic. A pre-tested questionnaire was applied by face to face interview to know about the demographic factors like age, occupation, education, caste, obstetric factors like age at marriage, age at first child, gravidity, parity, and dietary factors. Knowledge about anemia, practices regarding its prevention and utilization of antenatal care services were also sought. Hemoglobin was estimated using Sahli's method. Anaemia was defined as hemoglobin less than 11g/dl. Ethical clearance was obtained by institutional ethical clearance committee. Patients who were anemic were appropriately treated and their confidentiality maintained. A focused group discussion was conducted to assess the knowledge about anaemia and practices regarding its prevention. The results were tabulated and analyzed.

RESULTS

In this cross sectional study of 50 pregnant women, the following were the results.

The mean age of women who attended antenatal clinic at the primary health centre was 22 years $\pm$ 3.006 years.

The mean age at marriage of these women was 18.5 years.

The mean age at first child birth was 19.5 years.

Table 1: Age group of women.

Age of women at present pregnancy	No of women	Percentage
< 18 years	3	6
18- 20 years	21	42
21 - 25 years	21	42
>25 years	5	10
Total	50	100

Most of the women were in the active reproductive age group of 18-25 years.

Table 2: Gravida status of pregnant mothers.

Antenatal mothers in study	No of women	Percentage
Primigravida	20	40%
Mothers with atleast 1 child	30	60%
Total	50	100%

Majority of the women in this study had atleast one child.

Table 3: Socio demographic profile.

Education status	No of women	Percentage
Illiterate	14	28%
Higher primary school	10	20%
High school	17	34%
Pre university	07	14%
University degree	02	4%
occupation	No of women	Percentage
House wife	35	70%
Coolie/ labourer	12	24%
Office work/ clerk	03	6%
Socio economic status	No of women	Percentage
Higher middle class	4	8
Middle class	3	6
Lower middle class	12	24
Lower class	11	22
Below poverty line	20	40
Caste	No of women	Percentage
Schedule caste	24	48%
Schedule tribe	12	24%
Others	14	28%

Most of the women were literate in this population, and were from lower socioeconomic status. 14% of women were teenage pregnant, a significant figure. Majority of women (80%) had home visit by ANM.

Table 4: Teenage pregnancy.

Age at first pregnancy	No of women	Percentage
16 years	3	6
17 years	1	2
18 years	3	6
total	7	14

Table 5: Delivery of services.

Home visit by ANM	No of women	Percentage
Atleast one visit	40	80
No visit	10	20
total	50	100

Table 6: Utilization of services provided in antenatal care:registration of pregnancy.

Time of registration	No of women	Percentage
Early registration	31	62
Late registration	19	38
Total	50	100

Table 7: Utilization of services provided in antenatal care: IFA supplements.

IFA supplements	No of women	Percentage
Received from PHC	27	54
Prescribed at PHC taken outside	5	10
Not received at PHC or taken outside	18	36
Total	50	100

Table 8: Utilization of services provided in antenatal care : tablets consumption among those who received IFA.

IFA (100 tablets)	No of women	Percentage
Consumed	30	93
Not consumed	2	7
Total	32	100

Table 9: Utilization of services provided in antenatal care: temporary family planning services utilization for birth spacing.

Family planning method	No of women	Percentage
Cu T	23	46
OCP	0	0
Not used any method	27	54
Total	50	100

Majority of women had registered the pregnancy in early trimester, received and consumed iron supplementation. However the coverage of family planning method was

less than half of the population. Only 48% of the women had knowledge of consuming iron rich foods in their diet. Majority of the population (70%) had no access to sanitary latrine at their home

Table 10: No of ANC visits to PHC.

No of visits	No of women	Percentage
Minimum 3 visits	33	66
2 visits	12	24
1 visit	5	10
Total	50	100

Table 11: Wearing footwear to toilet and outside.

	Footwear to toilet	Percentage	Footwear outside	Percentage
Yes	43	86	46	92
No	07	14	04	8
Total	50	100	50	100

Majority of the women had the knowledge to wear footwear to the toilet. Women with chronic infections and gynecologic causes constituted 6% and 4% of the population.

Table 12: Grading of anaemia.

Grading of anaemia	No of women	Percentage
No anaemia	17	34
Mild anemia	29	58
Moderate anemia	4	8
Severe anemia	0	0
Total	50	100

Two thirds (66%) of the women were found to be anaemic in this population and 28 women (56%) of the women were pale on examination.

DISCUSSION

Anaemia in pregnancy continues to be a major public health problem all over the world. It has become an invisible pandemic similar to chronic illness like tuberculosis and HIV. In developing countries, reproductive age starts at a young age. Women get married earlier than 18 years and become pregnant within a year of marriage. There is no awareness on population control and women bear children without proper gap. As a result many women are anaemic before they become pregnant. Pregnancy increases the effects of anaemia and leads to more risks and consequences. As pregnancy goes on for nine months, the onset of anaemia and its effects are difficult to see in its initial stages. Anaemia does affect patients at all age groups. Pregnant women are at more risk for anaemia due to various causes.

A substantial proportion of women become anaemic during their pregnancy in both developing and developed

countries. Estimates from the World Health Organization report that from 35% to 75% (56% on average) of pregnant women in developing countries, and 18% of women from industrialized countries is anemic.¹⁰ The highest proportions of individuals affected are in Africa and in Southeast Asia.

In South Asia, India being most populous nation, population more than 1.25 billion, contributes highest to the prevalence of anaemia in pregnancy. Prevalence of anaemia in pregnant Indian women is 49.7%, against the global prevalence of 41.8%. India contributes to about 80% of the maternal deaths due to anaemia in South Asia and anaemia is an important cause of maternal mortality.¹¹ In India, anaemia is directly or indirectly responsible for 40 percent of maternal deaths. There is 8 to 10-fold increase in MMR when the hemoglobin falls below 5 g/dL.¹² Anaemia begins in childhood, worsens during adolescence in girls and gets aggravated during pregnancy.¹²

Iron deficiency is the most common cause of anaemia in pregnancy. It is the only nutrient deficiency that is significantly prevalent in low-resource countries.¹³

Deficient reserves of iron in the body are the main cause. Deficient reserves may be due to inadequate absorption like in malabsorption, chronic atrophic gastritis, and calcium mixed diet. Diets containing phytates and phenolic compounds impair the absorption of iron. Excessive intake of proton pump inhibitors reduces the acidity of gastric mucosa impairing the absorption of iron. Inadequate intake of iron rich foods (meat, poultry, fish, dry fruits, green leafy vegetables, and jaggery) is the important reason for deficient reserves of iron. Inadequate intake of vitamin C reduces iron absorption. The next important cause is the folate deficiency in pregnant women. In recent years, the contribution of B12 deficiency has been highlighted.¹⁴ Hook worm infestation, ascariasis, tuberculosis, chronic diarrhea, HIV, schistosomiasis, and importantly malaria in endemic areas are important causes for anemia.

In India, the prevalence of anaemia is high because of fewer intake of iron, folic acid and food sources that prevent iron absorption, coupled with poor bioavailability of iron is the major factor responsible for prevalence of anemia.¹⁵ Assuming that at least 10% of oral iron is absorbed, due to deficient intake it only makes up to less than 50% of daily requirement needed. At least 5mg/day in early months of pregnancy and up to 10mg/day in last months of pregnancy is required. Total of about 1500mg of iron in antenatal period is required to be absorbed to avoid the effects of anemia.

Non communicable diseases like inflammatory bowel diseases, malignancy, chronic liver disease and congenital causes like aplastic anaemia and thalassemia could pose a big threat in pregnant women. Blood loss in various forms like hemorrhage, bleeding through

menstruation, gynecologic causes, which are ignored at initial stages form a minority of pregnant women. Young age at marriage, multiparity, poor socioeconomic status, illiteracy, poor nutrition compound the problem of anaemia in pregnant women. Poor sanitation facilities, poor hygiene and contaminated drinking water increase the risks for communicable diseases which in turn increase the load of the problem. Other types of anaemia are due to thalassemia, sickle cell anemia, hemolytic anaemia and aplastic anemia.

Anaemia leads to variety of manifestations like tiredness, easy fatigability, dizziness, lethargy, breathlessness, pedal edema, cardiac failure. The adverse effects of anaemia on the child are intrauterine growth retardation, still birth, low birth weight, prematurity and pre term delivery.

The effects of anaemia on the mother are more pronounced during the third trimester of pregnancy. Mothers are prone for infections, sepsis, poor weight gain, postpartum hemorrhage and shock, preterm labour and heart failure. The immunosuppression caused by anaemia is mostly the cause for increased risk of infections and adverse effects on the pregnancy and its outcome. Early identification and treatment of infections in pregnancy improve the outcome for both mother and child. The major consequences of anaemia in pregnancy are maternal mortality and morbidity as well as low birth weight leading to increased infant mortality.^{16,17}

Women with mild anaemia during pregnancy are able to continue their routine work as they are well compensated by increased blood volume. Moderate anaemia patients have restricted capacity regarding their routine activities and are more prone for the adverse effects on the outcome of pregnancy. Patients with severe anaemia are often decompensated and have increased cardiac output, tachycardia, breathlessness and palpitations. Unless these patients are admitted and treated immediately, they go into cardiac failure, pulmonary edema and ultimately die of minimal blood loss during delivery. These cases directly increase the maternal mortality. Along with this any obstetric complications like twins, pregnancy induced hypertension, diabetes, and antepartum hemorrhage will contribute to the adverse outcome along with anemia. Therefore all anemic women are to be treated as high risk group.

Neonates of anemic mothers are born with suboptimal iron stores and are at high risk of developing iron deficiency anemia.¹⁸ Neonates continue to suffer from anaemic mothers as the breast milk also contains low content of iron. Poor iron stores at birth, low iron content of breast milk and low dietary iron intake through infancy and childhood results in high prevalence of anaemia in childhood.¹⁹⁻²¹ It may lead to poor cognitive functions, neurological disabilities and failure to thrive. Neonates may be born with distress requiring prolonged resuscitation in intensive care facilities. In 102 Indian

women in the first stage of labor, higher maternal hemoglobin concentrations were correlated with better Apgar scores and with a lower risk of birth asphyxia.²² Young girls who attain menarche early and women who marry at young age are anemic due to blood loss. This in turn leads to a vicious cycle of anemic mother - anemic child - anemic daughter - anemic mother.

It is well accepted that early detection and effective management of anaemia in pregnancy can substantially reduce maternal mortality and improve perinatal outcomes.²³ All pregnant women are offered anaemia screening in the form of hemoglobin estimation at the start of pregnancy. All women who are anemic in the first trimester are screened for other contributory causes for anaemia and treated for the same.

Iron supplementation in the form of iron and folic acid tablets are given to improve the stores needed later for blood volume expansion. Iron supplementation has time and again proven that it reduces the load of anemic pregnant women. Supplemental iron has proved beyond doubt that it increases the hemoglobin concentration in pregnant women, even in non-anemic and in last trimester of pregnancy. Several studies have showed that iron supplementation started in second trimester of pregnancy have shown increase in hemoglobin even up to 6 months postpartum period. This is important in women who become pregnant again soon after without any spacing or family planning.

The main measures to prevent anaemia in pregnant women will be through iron supplementation, dietary counseling, periodic screening during antenatal checkups, treatment of chronic illness and worm infestations, family planning and community surveillance. Extensive training for community health workers helps in carrying out these measures at ground level. They need to monitor the compliance of iron supplementation, and changes in dietary habits. Anaemia is just one manifestation of overall under nutrition and calorie and micronutrient deficiency in pregnant women. So supplementary feeding programs should aim at balanced nutrition of the pregnant women to improve the overall outcome.

Management of anaemia in pregnant women should become priority in practice. Compulsory screening of all pregnant women, dietary modifications and supplementation, coupled with blood transfusion and parenteral iron in severe anaemia have gone long way in reducing maternal morbidity and mortality.

Improving the maternal and reproductive health of women is a major challenge in developing countries like India. India was the first developing country to take up the national nutritional prophylaxis program among the South Asian countries of iron and folic acid supplementation to prevent anaemia among pregnant women and children.[†] Distribution of iron and folic acid tablets to all pregnant women irrespective of hemoglobin

status in any trimester was started under national anaemia prophylaxis program in 1972. They received elemental iron of 60mg and folic acid of 500mcg for 100 days during antenatal period. The patient compliance was poor and outcome marginally improved after two decades. It was later changed to national anaemia control program (NACP) in 1989 where women received 100mg of elemental iron. Women who were already anemic received two tablets daily.

District level household survey (DLHS) conducted to assess the implementation of national program demonstrated various deficiencies.²⁴ They included missed ANC checkups by women, non-availability of IFA tablets, non-compliance to consume IFA tablets and marginal improvement in anaemia in women who consumed IFA tablets. DLHS in 2006, demonstrated that there was slight improvement in percentage of women who were screened for anaemia and improved compliance regarding to consumption of IFA tablets.²⁵ These facts have shown that if all pregnant women are screened and treated appropriately in their antenatal period, it is possible to achieve the goal of decreased prevalence of anaemia in pregnancy.

Pregnant women with moderate to severe anemia, who present for anaemia control have benefitted by parenteral iron therapy in the form of iron sorbitol citrate injections given intramuscularly during the antenatal period. Oral supplementation in these women also continues at the same sitting. In this dual approach, it is possible for these women to become near normal during the time of delivery. The birth weight of child also improves with good perinatal outcome.

In spite of these measures, our country still faces a big hurdle in effective management of this problem and in reducing the incidence and prevalence of anaemia in pregnancy. The reasons are at various levels. Starting with planning, lack of resources, poor utilization of services and ineffective implementation of the plan. Along with this illiteracy, poverty, unemployment, ignorance, malnutrition, remote areas, underutilization of medical services and population explosion makes this problem more difficult to manage. Literature search in the last few years have shown little progress in the control of anaemia in pregnancy. Much more needs to be done to improve the accessibility of iron supplements, compliance of the pregnant women, screening and assessment, treatment of anemia, health education and empowerment of women to achieve our goals. A comprehensive plan with multiple interventions has to take effect on ground level to overcome this big hurdle in women health.

CONCLUSION

Anaemia continues to be a major risk factor for morbidity and mortality both in mother and child. Nearly half of the pregnant population is anemic in our country. Marginal

improvements have been achieved with national anaemia control program and more needs to be done. The main issues are the implementation of iron supplementation and periodic screening of pregnant women. Iron deficiency is the common cause for anaemia in pregnancy. Children born to anemic mothers are prone for low birth weight, prematurity and failure to thrive. Early recognition and appropriate management of pregnant women all through pregnancy substantially reduce the maternal morbidity and mortality. Health education and dietary counseling to all women in regard to this is valuable to tackle this difficult problem.

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