A PROSPECTIVE STUDY ON PREVALENCE AND MANAGEMENT OF ANAEMIA IN PREGNANCY WITH PERINATAL OUTCOME

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HOW TO CITE THIS ARTICLE:
Chintan Upadhyay, Ratna Bulusu, Nisha Shah. "A prospective study on prevalence and management of anaemia in pregnancy with perinatal outcome". Journal of Evolution of Medical and Dental Sciences 2013; Vol2, Issue 35, September 2; Page: 6664-6672.

ABSTRACT: BACKGROUND: Anemia during pregnancy is highly prevalent in India. There is predominance of iron deficiency anemia (nutritional anemia). Pregnancy is the condition which increases requirement of nutrients especially iron and folic acid & also causes hemodilution. Because of these reasons, anemia gets aggravated in pregnancy. The incidence varies with literacy, socio-economic status, family support and financial stability. Anemia in pregnancy has adverse effects on maternal and fetal health. Chronic anemia during pregnancy can cause glossitis, stomatitis, changes in nails and skin, breathlessness, cardiac failure in mother. Obstetrical complications like low birth weight babies, IUGR, increased rate of preterm deliveries & increased perinatal mortality are also known. PPH also worsens the situation. Severe anemia in mother may lead to serious neurological damage in the fetus. This study is aimed at finding out the prevalence and type of anemia during pregnancy. This study will definitely help to decrease the burden of anemia and its complications. **OBJECTIVES:** To study the Hb level in pregnant women during first visit, 30th week, and 36th weeks of gestation. To note the type and degree of anemia. To note the need for medical therapy and its route of administration and/or blood transfusion. To note the maternal and neonatal outcome thereafter. **METHODS:** The study was carried out in the Department of Obstetrics and Gynaecology, Dr. B. R. Ambedkar Medical College and Hospital, Bangalore for a period of two years. A prospective randomized study conducted on 200 pregnant women. All subjects were analyzed in full details and hemoglobin estimation done during 1st visit, at 30th week and 36th week of gestation. They were classified according to WHO criteria. According to degree of anemia all the subjects were treated and maternal and perinatal outcome were studied. **RESULTS:** The incidence of mild anemia 29.5%, moderate anemia 53% and 17.5% severe anemia noted. In the booked cases, perinatal outcome was good compared to unbooked and referred cases. The parameter of poor fetal outcome like preterm birth, IUGR, IUD and NICU admission were more in the unbooked and referred cases. **CONCLUSION:** Anemia in pregnancy continues to be a major problem in developing countries with maternal and fetal complications. Correct diagnosis and treatment of the underlying cause can improve the diagnosis. Ensuring maternal iron sufficiency during gestation is the most cost effective method of preventing perinatal iron deficiency and related morbidities.
KEYWORDS: Anemia; Pregnancy; Maternal outcome; Neonatal outcome

INTRODUCTION: "Pregnancy is special: let's make it safe"

Pregnancy is a unique experience in every woman's life. The thought of a growing foetus in the mother's womb, indeed is nature's way of expressing the attributes of motherhood.[1]

Anemia in pregnancy is one of the most important public health problems not only in India but also in most of the South East Asian countries. About 16% to 40% of maternal deaths occur due

to anemia. Most of the pregnant patients presenting to outpatient department have iron deficiency anemia. Most of the population in India lives in rural areas where the better health care services are not available to them.

Standards lay down by WHO suggests hemoglobin below 11 gm% as anemia. According to standards laid down, incidence of anemia during pregnancy in India ranges between 65% to 75%.[2]

In India the National Nutritional Anemia Control Programme (NNACP) was initiated in 1970 to provide free iron folic acid supplementation to pregnant women commencing from second trimester to three months postpartum. In a recent study, the Healthcare and Research Association for Adolescents and Nutrition Foundation of India, New Delhi, studied and concluded that prevalence and severity of anemia in rural pregnant women was 84%, of which 9.2% were severe anemia. The Indian Council Medical Research (ICMR)'s data also shows 84.2% anemia prevalence in rural pregnant women, of which 13.1% were severe anemia.[3]

Anaemia, the most preventable cause of maternal mortality, should be eradicated from the female population in the coming years that will ensure better maternal and perinatal health, happy family and a healthy nation. Multifaceted approach is needed to correct anaemia in pregnant women. It is very necessary that anaemia with pregnancy is managed on war footing. Hence the need for this study to reaffirm the various consequences of anaemia and to effectively counsel women to prevent further obstetrical mishap due to a condition which could be easily corrected in vast majority of cases.

AIMS AND OBJECTIVES:

1. To study the Hb level in pregnant women during first visit, 30th week, and 36th weeks of gestation.
2. To note the type and degree of anemia.
3. To note the need for medical therapy and its route of administration and/or blood transfusion.
4. To note the maternal and neonatal outcome thereafter.

METHODOLOGY:

MATERIALS: The study titled “PREVALENCE AND MANAGEMENT OF ANEMIA IN PREGNANCY WITH PERINATAL OUTCOME” was conducted in the department of Obstetrics and Gynaecology, Dr. B. R. Ambedkar Medical College and Hospital, Bangalore, Karnataka.

Period of study: 2 Years, from 1st September 2009 to 31st August 2011.

Selection of the patient: A prospective randomized study was conducted on all pregnant women during 1st visit, at 30th and 36th week of gestation, attending OPD as well as IPD of OBG Department in Dr. B. R. A. M. C. H., Bangalore.

Sample size

200 antenatal cases attending the OPD of Dr. B. R. Ambedkar Hospital.

METHODS: After taking detailed history and consent for screening, the data was collected by examination of OPD and IPD patient. All the subject were analyzed in full details regarding age,

literacy, socio economic status, parity, interval between conceptions, significant past history and other complication associated with anemia were noted.

Subjects were followed further by through general physical, systemic and obstetric examination. This was done as per the proforma prepaid for the study.

Data was collected from all obstetric patients at 1st visit, 30th weeks & 36th weeks of gestation.

The investigations that done on these subjects were:

1. Hemoglobin percentage: Quantitative estimation of hemoglobin was done by Sahli's Method.
2. Peripheral smear: The type of anemia was studied by peripheral smear examination.

All the subjects were classified according to WHO criteria and According to degree of anemia all the subjects were treated with either oral iron or intravenous iron or blood transfusion and carefully followed in the antepartum, intrapartum and postpartum periods.

Finally, the mode of delivery, maternal and perinatal outcome were studied in all the study subjects.

Statistical methods employed

1. The Mean
2. Standard Deviation (SD)
3. Chi-Square Test
4. Fisher Exact Test
5. Significant figures
   - \+ Suggestive significance (p value: $0.05<p<0.10$)
   - * Moderately significant (p value: $0.01<p \leq 0.05$)
   - ** Strongly significant (p value: $p \leq 0.01$)

RESULTS:

Table 1: Table showing comparison between SES with severity of anemia

	Severity of anemia			p value
	Mild (n=59)	Moderate (n=106)	Severe (n=35)	
SES				
• Lower	47	87	31	0.539
• Middle	12	19	4	

Severity of anemia was more common in lower socio-economic group than middle and upper socio economic class. p value is 0.539 which is not significant.

Table 2: Table showing comparison between B/UB/R with severity of anemia

	Severity of anemia			p value
	Mild (n=59)	Moderate (n=106)	Severe (n=35)	
Booked /Unbooked				
• Booked	37	60	9	0.009**
• Unbooked	15	28	16	
• Referred	7	18	10	

A severity of anemia was more common in unbooked and referred cases. p value 0.009 which is significant.

Table 3: Table showing comparison between parity with severity of anemia

	Severity of anemia			p value
	Mild (n=59)	Moderate (n=106)	Severe (n=35)	
Parity				
• Primigravida	28	31	7	0.012*
• Multigravida	31	75	28	

Multiparity is more prone for anemia compare to primigravida. p value 0.012 is significant.

Table 4: Table showing comparison of risk factors with severity of anemia

Risk factors	Severity of anemia			p value
	Mild (n=59)	Moderate (n=106)	Severe (n=35)	
PE	8(13.6%)	14(13.2%)	17(48.6%)	<0.001**
PROM	8(13.6%)	17(16%)	10(28.6%)	0.152
OLIGO	1(1.7%)	9(8.5%)	3(8.6%)	0.194
HYPOTHYROID	3(5.1%)	1(0.9%)	1(2.9%)	0.261
RH-VE	1(1.7%)	7(6.6%)	2(5.7%)	0.416
PLACENTA PRV	0(0%)	1(0.9%)	1(2.9%)	0.403
GDM	4(6.8%)	2(1.9%)	0(0%)	0.109
GHTN	0(0%)	4(3.8%)	2(5.7%)	0.231
ABRUPTIO PLACENTA	1(1.7%)	1(0.9%)	0(0%)	0.724

With the severity of anemia the incidence of risk factors were increased. As shown in the table pre-eclampsia (48.6%) and PROM (28.6%) are more common with severe anemia, which is significant.

Table 5: Table showing comparison between maternal outcomes with spacing between two pregnancies

Maternal outcome	Spacing between two pregnancies		p value
	<2 years (n=79)	>2 years (n=50)	
FTD	60(75.9%)	43(86.0%)	0.166
PTD	19(24.1%)	7(14.0%)	0.182
IUGR	11(13.9%)	3(6.0%)	0.159
IUD	2(2.5%)	1(2.0%)	1.000
Puerperium	11(13.9%)	5(10.0%)	0.510

In present study, who had spacing between two pregnancy <2 years had more pre term deliveries (24.1%), Intrauterine growth restriction (13.9%), Intrauterine death (2.5%) and puerperal complication (13.9%) compared to women who had spacing between two pregnancy >2 years.

Table 6: Table showing comparison between maternal outcomes with B/UB/R cases

	Booked/ Unbooked/ Referred			p value
	Booked (n=106)	Unbooked (n=59)	Referred (n=35)	
Maternal outcome				
• FTD	96(90.6%)	43(72.9%)	21(60%)	<0.001**
• PTD	10(9.4%)	16(27.1%)	14(40%)	<0.001**
• IUGR	12(11.3%)	7(11.9%)	4(11.4%)	0.994
• IUD	1(0.9%)	1(1.7%)	4(11.4%)	0.023*
• Puerperium	7(6.6%)	15(25.4%)	7(20%)	0.003**

In the present study, maternal outcome was good in booked cases. Preterm deliveries, intra uterine growth restriction and intrauterine death were more common in unbooked and referred cases, which is statistically significant.

Table 7: Table showing comparison between severities of anemia with spacing between two pregnancies

Severity of anemia	Spacing between two pregnancies	
	<2 years (n=79)	>2 years (n=50)
Mild	14(17.7%)	14(28.0%)
Moderate	47(59.5%)	27(54.0%)
Severe	18(22.8%)	9(18.0%)
Inference	Severity of anemia is positively associated with < 2 years of spacing between two pregnancies with p=0.370	

Table 8: Table showing comparison between fetal outcomes with B/UB/R cases

	Booked/ Unbooked/ Referred	p value

	Booked (n=106)	Unbooked (n=59)	Referred (n=35)	
Fetal outcome				
PT/FT	(0%)	(0%)	(0%)	<0.001**
• PT	10(9.4%)	16(27.1%)	14(40%)	
• FT	96(90.6%)	43(72.9%)	21(60%)	
IUGR				
• No	89(84%)	37(62.7%)	19(54.3%)	<0.001**
• Yes	17(16%)	22(37.3%)	17(48.6%)	
NICU				
• No	88(83%)	39(66.1%)	22(62.9%)	0.013*
• Yes	18(17%)	20(33.9%)	13(37.1%)	
IUD				
• No	105(99.1%)	58(98.3%)	31(88.6%)	0.023*
• Yes	1(0.9%)	1(1.7%)	4(11.4%)	

The incidence of preterm babies, IUGR, IUD and NICU admissions were more in unbooked and referred cases compared to booked cases.

Table 9: Table showing comparison between management with B/UB/R cases

Management	Booked/ Unbooked/ Referred			p value
	Booked (n=106)	Unbooked (n=59)	Referred (n=35)	
Oral	106(100.0%)	45(76.3%)	32(91.4%)	<0.001**
IV	51(48.1%)	33(55.9%)	19(54.3%)	0.589
BT	0	16(27.1%)	11(31.4%)	<0.001**

The requirement of blood transfusion were more in unbooked (27.1%) and referred (31.4%) cases compared to booked cases, which is statistically significant.

DISCUSSION: In the present study 200 women were studied. The present study aimed at prevalence and management of anemia in pregnancy with maternal and fetal outcome.

The various parameters of the subjects were studied, analyzed and evaluated with the standard literature reading available.

In present study, 29.5% mild, 53% moderate and 17.5% were severely anemic.

Majority of the anemic study subjects in the present study belonged to the age group of 20-24 years (46.5%). This was comparable with the results of Alli R et al.[4] The percentage of anemic women in his study was 40% in the same age group.

Low socio-economic status is said to predispose to anemia, poor nutrition being the leading cause of anemia.

In the present study, 82.5% of the anemic women belonged to the low socioeconomic group while 100% of women of the study of Alli R et al belong to the low socioeconomic group.[5] Findings of

the present study were also comparable with Rangnekar et al[6], in whose study 67% of anemic women belonged to low socio-economic group suggesting a close relationship between low socioeconomic conditions and pregnancy anemia.

Effective and adequate antenatal care is essential for early identification and treatment of anemia. In present study 53% of women were booked cases. 29.5% and 17.5% were unbooked and referred cases respectively. In present study 74.2% had severe anemias in unbooked and referred cases were also comparable with Awasthi A et al[7] (83.5%).

Anemia in pregnancy is more common in women of high parity due to frequent pregnancy and inadequate spacing. Mean spacing between births has an impact on the hemoglobin status of women. In present study spacing between pregnancy < 2years was 61.2% and >2 years in 38.8%. It was comparable with Khandait DW et al[8], 55.9% and 44.1% in < 2 years and > 2years respectively.

Severity of anemia is positively associated with < 2 years of spacing between two pregnancies with p=0.370.

A definitely association has been suggested between severe anemia and pregnancy induced hypertension. In the present study, 22.5% women had pregnancy induced hypertension. It was comparable with Awasthi A et al[7] (24.5%) and Sarin AR et al[9] (28.5%).

The commonest type of anemia in the present study was Microcytic Hypochromic anemia (82.5%) followed by Dimorphic anemia (17.5%). Which was comparable with the study of Awasthi A et al[7] (66.5%), Rangnekar GA et al[6] (65%), Alli R et al[4] (68%).

In the present study, 91.5% of subject received oral iron. 51.5% and 13.5% received parenteral (IV) iron and blood transfusion respectively. The requirement of blood transfusion were more in unbooked (27.1%) and referred (31.4%) cases compared to booked cases, which is statistically significant.

Preterm deliveries (20%), IUGR (11.5%) and IUD (3%) were the important maternal outcome in present study, which was comparable with the study of Sarin AR[9] who observed that 31.2% women had preterm deliveries. High incidence of preterm deliveries, IUGR and IUD were seen in spacing between pregnancy < 2years.

In present study, 90.6% of women had FT deliveries, High incidence of preterm deliveries 27.1% and 40% in unbooked and referred cases compare to booked, which were statistically significant. IUD was more seen in the referred (11.4%) cases compared to booked cases, Postpartum complication were also high in unbooked (25.4%) and referred (20%), which were also statistically significant.

High incidence of adverse fetal outcome in the form of preterm (20%), IUGR (28%), NICU admission (25.5%) and IUD (3%) seen in present study. These were comparable with the observation of Awasthi A et al[7] PT (9.5%), IUGR (37.5%) and IUD (8%) and also comparable with Rangnekar et al[6] PT (73%), IUGR (4%) and IUD (16%).

In the present study, incidence of preterm deliveries in unbooked cases (27.1%) and referred cases (40%) were high compared with booked cases (9.4%). High incidence of IUGR was seen in unbooked (37.3%) and referred (48.6%) cases compared with booked cases (16%). As anemia predisposes to birth asphyxia due to placental insufficiency, need for NICU admission were more.

Among those unbooked (33.9%) and referred (37.1%) required more NICU admission compared to booked (17%) cases due to severe anemia. IUD was seen more in referred (11.4%)

cases with severe anemia and associated risk factors were severe pre-eclampsia, GDM and PROM. These all outcome were statistically significant.

Incidence of low birth weight babies in the present study was 46.3% which was comparable with 66% observed by Rangnekar et al[6] and 69.1% by Khalida H et al.[10]

One of the recent study done in Muscat in 2012 by Judith Angelitta and all suggests that maternal age, parity and late prenatal visit were independently associated with maternal anemia, low birth weight and preterm birth.[11]

In 2010 One study done in India through a retrospective approach, 4,456 women's hospital record were reviewed and the result shows that 17.9%(798) of them were anemic, out of this 2.15%(96) of them were found to be severely anemic and six out of 96 women died due to severe anemia[12]

Cochrane review 2009 shows that Microcytic hypochromic anemia resulting from iron deficiency is the most frequent form of anemia (76%), followed by folate deficiency (20%) and combined iron and folate deficiency (20%).[13]

CONCLUSION: Anemia is the commonest medical disorder in pregnancy which exists world over and is a very common problem in most of the developing countries. It is not only a medical problem, but is a major public health problem. In country like India, it is frequently severe and contributes significantly to maternal mortality and reproductive health morbidity.60-80% of pregnant women in developing countries have anemia and 40% of maternal deaths in the third world are related to anaemia. Among various causes of anemia, 90% are nutritional in origin. Iron deficiency is the commonest nutritional anemia followed by folic acid deficiency.

Iron supplementation during pregnancy in iron deficient mothers improves iron status during pregnancy and postpartum period, thus providing some protection against iron deficiency in the subsequent pregnancy. Ensuring maternal iron sufficiency during gestation is the most cost effective method of preventing perinatal iron deficiency and related morbidities.

Joint social and medical efforts are required for overall improvement of living status of women. Proper antenatal care is the basic requirement for prevention, early detection and treatment of anemia. Emphasis should be laid on prevention of anemia by active participation of governmental and nongovernmental organizations, FOGSI, local societies etc.

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Date of Submission: 19/08/2013.
Date of Peer Review: 20/08/2013.
Date of Acceptance: 24/08/2013.
Date of Publishing: 27/08/2013