



## PROSPECTIVE STUDY ON PREVALENCE OF ANEMIA IN PREGNANT WOMEN AND ITS ASSOCIATION WITH MATERNAL AND FETAL OUTCOME

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### ABSTRACT

Anaemia is one of the most common nutritional deficiency disorders affecting the pregnant women in the developing countries. Anaemia during pregnancy is commonly associated with poor pregnancy outcome and can result in complications that threaten the life of both mother and foetus. **Objective:** The objective of the study was to estimate the prevalence of anaemia among the women who are pregnant and to determine its association with maternal and foetal outcomes. **Materials and methods:** Two hundred pregnant women of gestational age >37 weeks with previous and recent Haemoglobin report were included in the study and were followed up till 7 days post delivery. Appropriate statistical tests were applied. **Results:** Among the study group, 63% of pregnant women had anaemia from which about 24% of the women had maternal and foetal morbidity. Out of the 63% of anemic pregnant women, 2.38% had postpartum hemorrhage, 2.74% had preeclampsia, 3.17% went into LSCS, 1.58% had obstructed labour. The fetal complications include low birth weight (27.7%) followed by preterm delivery (3.17%) and birth asphyxia (2.38%). **Conclusions:** A high prevalence of anaemia in pregnant women increases the maternal and foetal risks. To improve the maternal and foetal outcome, all the pregnant women must be prevented of anaemia by prophylactic iron administration, must be diagnosed of anaemia at an early stage, and be treated to avoid further antenatal and postnatal complications.

### KEYWORDS :

#### INTRODUCTION-

Anaemia has been recognized as the most common form of nutritional deficiency worldwide, particularly in developing countries like India. Though anaemia is easily treatable and preventable disease, it continues to be significantly associated with pregnancy.<sup>1</sup> Diminished intake and increased demand, excess demand in case of multigravid woman and altered metabolism along with the background characteristics like low socioeconomic status, illiteracy, early age of marriage associated with increase in susceptibility to infectious diseases like hookworm infestations may serve to be the underlying factors associated with prevalence of anaemia during pregnancy.<sup>2</sup>

Haemoglobin value of <11 g/dL is defined as anaemia in pregnancy. Anaemia in pregnancy can be further divided as mild, moderate and severe anaemia for haemoglobin level 9–10.9 g/dL, 7–8.9 g/dL and severe <7 g/dL.<sup>3</sup>

Apart from maternal mortality, anaemia in pregnancy may result in low birth weight, intrauterine growth retardation, still-birth, and neonatal death.<sup>4</sup>

The key for safe motherhood is reduction of maternal anaemia. The risk factors of anaemia particularly during pregnancy are multifactorial and complex. So, knowledge of these risk factors is very much essential to prevent anaemia and its consequences.<sup>5</sup>

The prospective observational study is undertaken to estimate the prevalence and to study maternal and early neonatal morbidity and mortality associated with anaemia in a pregnant woman.<sup>8</sup>

#### MATERIALS AND METHODS

This prospective study was conducted at tertiary care centre in Dakshina Kannada, India, for the period of 3 months. Data was being collected randomly from 200 pregnant women of

gestational age >37 weeks. A consent form was filled by each participant before conducting the study. Haemoglobin level during the first visit was compared with the haemoglobin level in the latest visit. Any history of iron or blood transfusion undergone during the antenatal period was asked. Improvement in the Haemoglobin levels was observed in those with low haemoglobin levels. Patient was followed upto 7 days post delivery for any maternal and foetal complications.

The HB measurements of the pregnant woman were measured using HemoCue analyzer (HemoCue Hb 301). Anaemia was classified based on the WHO criteria; HB concentration of <11 g/dl was considered as anaemia. HB concentration of 9–10.9 g/dl, 7–8.9 g/dl, and <7 g/dl was considered as mild, moderate, and severe anaemia, respectively.

The data were analysed using IBM SPSS Statistics V22.0 (IBM United States). The quantitative measures are presented by mean and standard deviation and qualitative variables by proportions. Chi-square test.  $P \leq 0.05$  was considered statistically significant.

#### Inclusion Criteria

Pregnant women of gestational age >37 weeks attending ANC who filled the consent form having their Haemoglobin (Hb) report.

#### Exclusion Criteria

Unwilling pregnant women and who did not have haemoglobin report with them were excluded from the study.

#### Statistical Analysis

The data were analyzed using SPSS version 22; frequency, percentage and Chi-square test were used.

#### RESULTS

In our study, 200 pregnant women of gestational age >37

weeks were included. The demographic characteristics of the pregnant women are shown.(Table 1). The most common age group in our study was 20-30 years (54.5%) and majority were of low socioeconomic status (57.5%). Multiparity patients were associated with (81%) risk of anaemia. Maximum numbers of study subjects were of Hindu in religion (94.5%). Gestational age of 25 weeks and above were associated with increased risk of anaemia(43%)

**Distribution Of Pregnant Women According To Variable Characteristics (Table 1)**

PARAMETER	NUMBER	PERCENTAGE	P value	SIGNIFICANCE
AGE GROUP (YEARS)				
<20	88	44	0.781100633	NON SIGNIFICANT
20-30	109	54.5	0.521417625	NON SIGNIFICANT
>30	3	1.5	0.102981377	NON SIGNIFICANT
RELIGION				
HINDU	189	94.5	0.819430492	NON SIGNIFICANT
MUSLIM	11	5.5	0.613978138	NON SIGNIFICANT
SOCIOECONOMIC STATUS				
LOW	115	57.5	3.784	NON SIGNIFICANT
MIDDLE	84	42	9.1742	NON SIGNIFICANT
HIGH	1	0.5	9.1742	NON SIGNIFICANT
GRAVIDA				
PRIMI	38	19		
MULTI	162	81	0.038267545	SIGNIFICANT
DURATION OF PREGNANCY (WEEKS)				
<12	48	24	6.7987	NON SIGNIFICANT
25 WEEKS AND ABOVE	86	43	1.12357	NON SIGNIFICANT

Among the pregnant women, 63% suffered from anaemia, majority had mild anaemia (46%), followed by moderate anaemia (15%). Only (2%) were suffering from severe anaemia while the rest had no anaemia. [Table 2].

**Distribution Of Severity Of Anaemia According To Who Criteria**

Hb Level	Severity of anaemia	No. of cases	Percentage
<7	Severe	4	2
7.1-8.9	Moderate	30	15
9-10.9	Mild	92	46
>11	Normal	74	37

Association of anaemia with low socioeconomic status was found to be 60%, 20% and 7% for mild, moderate and severe and no anaemia respectively [Table 3] which was statistically significant [P = 0.03]. No significant association of severity of anaemia with the educational status of the pregnant women was detected.

**Distribution Of Pregnant Women According To Socio Economic Status With Respect To Severity Of Anemia (table 3)**

ANEMIA	SOCIO-ECONOMIC STATUS		TOTAL (%)
	LOW(%)	MIDDLE AND HIGH(%)	
SEVERE+MODE RATE	20(10)	14(7)	34
MILD	60(30)	32(16)	92
NORMAL	7(3.5)	67(33.5)	74
TOTAL	87(43.5)	113(56.5)	200(100)

**Distribution Of Pregnant Women According To Complications And Anemia Status (table 4)**

Complication S During Delivery	Normal (%)	Anaemic (%)	Total	P Value	Significance
Anaemia status	74 (37)	126 (63)	200	0.27133	NON SIGNIFICANT
LSCS	2 (2.70)	4 (3.17)	6	1	NON SIGNIFICANT
LBW	15(20.2)	35 (27.7)	50	0.004	SIGNIFICANT
Preterm delivery	1(1.35)	4(3.17)	5	0.003	SIGNIFICANT
Prolonged labor	0	2 (1.58)	2	0.0001	SIGNIFICANT
Preeclampsia	2(2.74)	2 (2.74)	4	0.32	NON SIGNIFICANT
PPH	1 (1.35)	3 (2.38)	4	1.23	NON SIGNIFICANT
Birth asphyxia	0	2 (2.38)	2	0.002	SIGNIFICANT
Obstructed labor	3 (4.05)	2 (1.58)	5	1.45	NON SIGNIFICANT

During the follow-up, there was a significant improvement in the HB levels from a mean of 10.3-10.72 g%. The number of women having various grades of anaemia reduced and the number of women with normal HB increased during the follow-up this was statistically significant [TABLE 5].

**Comparison Of Anemia Status Between Baseline And At The End Of The Study**

Hemoglobin (g%)	Baseline N(%)	At Full Term N(%)	P value	Significance
<7	6(2.8)	4 (2.3)	0.52708926	NON SIGNIFICANT
7.1-9.9	49 (24.5)	30 (15)	0.03254378	SIGNIFICANT
10-10.9	97 (48.5)	92(46)	0.71608467	NON SIGNIFICANT
>11	54(27)	74(46.6)	0.01857614	NON SIGNIFICANT
TOTAL	200(100)	200 (100)		

**DISCUSSION**

Indian Council of Medical Research surveys showed that over 70% of pregnant women in the country were anaemic.[2] Similar prevalence rate of anaemia (63%) in pregnant women was observed in the present study. In contrast, very high prevalence was observed by Viveki *et al.*, Totega, Agarwal *et al.*, and Gautam *et al.* (82.9%, 84.9%, 84%, and 96.5%, respectively).[4,7,] However, lower prevalence was reported from Nepal (42.5%) and Haryana (51%) and NFHS-2 and 3 (49.7%).[1,2,4].

Severe anaemia among the participants in the present study was low (2%) which was similar to study by Kapil and Sareen (1.6%) and NHFS-2 (2.5%).[10] Whereas other studies reported higher prevalence; Totega (13.1%), Agarwal *et al.* (9.2%), Vivek *et al.* (7%), and Gautam *et al.* (22.8%).[4,7.]

Maternal anaemia is considered as risk factor for poor pregnancy outcomes, and it threatens the life of foetus. In the present study, about 24% of the women had maternal and foetal morbidity. LSCS, abortions, obstructed labour, PPH,

preeclampsia, prolonged labour, LBW, and birth asphyxia were commonly seen among anaemic pregnant women. In the present study, 27.27% of anaemic pregnant women delivered low birth weight babies. A study by Sangeetha in Bangalore reported highest (63%) prevalence of LBW among pregnant women, whereas Marahatta observed least (16.6%). [1,6] The other foetal complications among pregnant women in the present study include premature delivery (0.2%) and birth asphyxia (0.5%).

In the present study, gravida status, and duration of pregnancy of pregnant women were significantly associated with anaemia. A study by Chowdhury *et al.* in Bangladesh also found that education of women was significantly associated with anaemia in pregnancy, whereas in a study by Singh *et al.* observed an insignificant association between anaemia and gravida. [7]

There was a significant statistical association between anaemia and complications during pregnancy in the present study, which is similar to the study conducted by Nair *et al.* [8]

## CONCLUSION

Anaemia in pregnancy increases the maternal and foetal risks. Age of the pregnant women, socio economic status, and parity were found to be risk factors contributing for anaemia in pregnant women.

To improve the maternal and foetal outcome, all the pregnant women must be prevented of anaemia by prophylactic iron administration, must be diagnosed of anaemia at an early stage, and be treated to avoid further antenatal and postnatal complications.

Health education on reproductive health, monitoring the consumption of iron folic acid tablets, early diagnosis of high-risk pregnancy, and appropriate management are important health-care measures to be undertaken.

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