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Study of Anemia during Pregnancy in Multigravida Women

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Anemia is a prevailing health issue faced by many women during their pregnancy. World Health Organisation has proposed the level of hemoglobin in women during pregnancy to classify anemia. The present work was done on 204 women subjects of Darbhanga district who were pregnant, to study the pattern of anemia specially in multigravida women. Data was collected from different antenatal units. In the present study, we deduced that maximum number of women were anemic, also anemia had a higher prevalence in women with higher parity.

Keywords: Anemia; haemoglobin; Darbhanga; parity.

1. INTRODUCTION

Anemia is defined as a decrease in the total circulating red cell mass below normal limits.

In anemia there is a reduction in the oxygen-carrying capacity of the blood, which leads to tissue hypoxia. The measurement of red blood cell mass is not easy, so anemia is diagnosed based on the reduction in the hematocrit i.e., the

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ratio of packed red cells to total blood volume and the hemoglobin concentration.

The World Health Organization (WHO) defines anemia in pregnant women as hemoglobin level below 11 g/dl [1].

The Centers for Disease control (CDC) recommends that hemoglobin in pregnant women should not be allowed to fall below 10.5 g/dl [2].

According to Indian Council of Medical Research (ICMR), anemia is classified as: [3].

Mild anemia	8.0 – 10.9 g/dl
Moderate anemia	5.0 – 7.9 g/dl
Severe anemia	< 5 gm/dl

In the industrialised world, anemia affects 10–12% of women in the reproductive age range, but it affects 70–80% of women in India, according to reports. Anemia is associated with higher maternal morbidity and mortality. Iron deficiency anemia is among the most prevalent medical disorders that pregnant women experience. Pregnant women typically have low iron reserves in addition to the normal hemodilution-related drop in hemoglobin. Due to the pregnant woman's lack of iron supplementation and much faster expansion of plasma volume compared to the rise in red cell volume, the hemoglobin level somewhat decreases during pregnancy [4].

Poor pregnancy outcomes have apparently been linked to anemia, especially when it appears in the third trimester. In addition to the prevalent causes of anemia in pregnant women, women with higher birth orders are more likely to have poorer iron replacement following a pregnancy event. Anemic women are more prone to experience maternal difficulties in the third trimester, such as infections, toxemia, antepartum hemorrhage, heart failure, and pre-eclampsia. Additionally, they incur the chance of prenatal hazards like low birth weight, premature labor, developmental delays, and even neonatal demise [5].

Of the maternal deaths due to anemia in South Asia, 80% occur in India [6].

Increased physiological and fetal needs, inadequate intake, poor absorption caused by endemic diseases like malaria and hookworm infestation, and blood loss owing to many pregnancies throughout the pregnancy or during and after labor are all factors that contribute to anemia in obstetrics [7].

Inability to replenish their iron stores is common in pregnant women who have moderate to severe anemia in the late second and early third trimesters. Therefore, even with active transport across the placenta, insufficient iron may be delivered to the growing fetus with concomitant detrimental effects, such as long -term neurodevelopmental damage of the infant [8].

Poor maternal and fetal outcomes, including antepartum and postpartum hemorrhage, gestational diabetes, hypertension, anemia, and preterm birth, can be caused by multiparity.

2. MATERIALS AND METHODS

The present work was carried on 204 pregnant female subjects of Darbhanga district, Bihar, who visited hospitals for their antenatal care.

Data was collected from those hospitals for the assessment of the objective of the study under taken.

For the study under taken the following parameters were taken into consideration and accordingly the data was collected:

1. Age of the women
2. Hemoglobin level (Automated CBC)
3. Severity of anemia
4. Gestational age
5. Gravida
6. Any other medical complaints

All complication criteria were included like thalassemia, etc.

After the data were collected, suitable statistical tools were applied to deduced the final result.

3. RESULTS

In the study conducted required data was collected from all together 204 pregnant women. Data collected was primarily divided on the basis of anemia i.e., mild, moderate and severe. This grading was done on the basis of standards led by WHO [1]. Thereafter, the data was categorised on the basis of type of anemia in different gestational age and the gravida of the pregnant women.

The results obtained showed that not all the pregnant women taken into consideration were anemic some were non-anemic also. Also, no case of mild anemia was found.

The study showed that the prevalence of severe anemia in the women with 1st gravid was minimum i.e., 0 and that with the women with 3rd and multigravida was much higher i.e., 21 and 15 respectively. Also, each woman with multigravida was anemic either moderate or severe.

Also, the result was deduced that maximum no. of women was anemic along with that the incidence of moderate anemia was found to be 72.54% and that of severe anemia was 20.11% and 7.35% women were non-anemic.

Also, 43 out of 47 (91.48%) women of 1st gravida, 24 out of 44 (54.54%) women of 2nd gravida, 13 out of 28 (46.42%) women of 3rd gravida and 13 out of 29 (44.82%) with multigravida came for their antenatal care in 1st trimester.

Table 1. Correlation between gestational age and anemic women

Gestational Age	No. of women	Non-Anemic	Moderate Anemia	Severe Anemia
First Trimester	93	11; χ^2=2.53	71; χ^2=0.18	11; χ^2=3.16
Second Trimester	41	3; χ^2=0.00	35; χ^2=0.93	3; χ^2=3.33
Third Trimester	70	1; χ^2=3.34	42; χ^2=1.52	27; χ^2=11.89
Total	204	15	148	41

The chi-square statistic is 26.89. The p-value is 0.00001
The result is significant at p<0.01

Table 2. Correlation between gravida and anemic women

Gravida	No. of women	Non- anemic	Moderate Anemia	Severe Anemia
First gravida	58	11; χ^2=10.64	47; χ^2=0.58	0; χ^2=11.66
Second gravida	51	2; χ^2=0.82	44; χ^2=1.32	5; χ^2=2.69
Third gravida	51	2; χ^2=0.82	28; χ^2=2.19	21; χ^2=11.27
Multigravida	44	0; χ^2=3.24	29; χ^2=0.27	15; χ^2=4.29

The chi-square statistic is 49.7692. The p-value is <0.00001
The result is significant at p<0.01

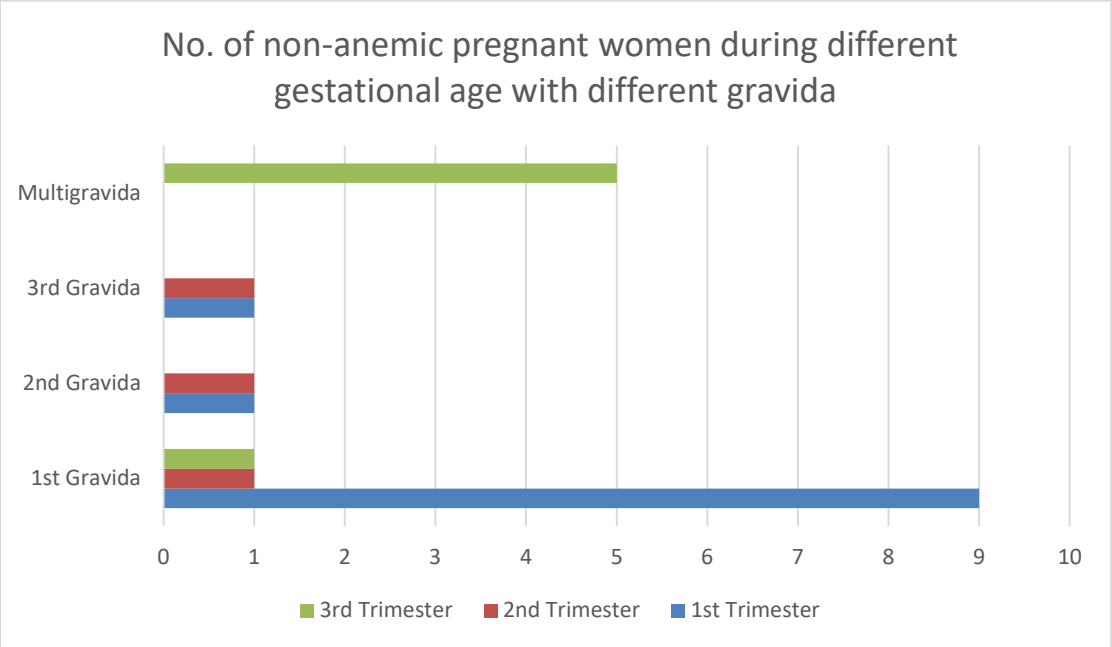

Fig. 1. Graphical distribution of non-anemia pregnant women during different gestational age with different gravid

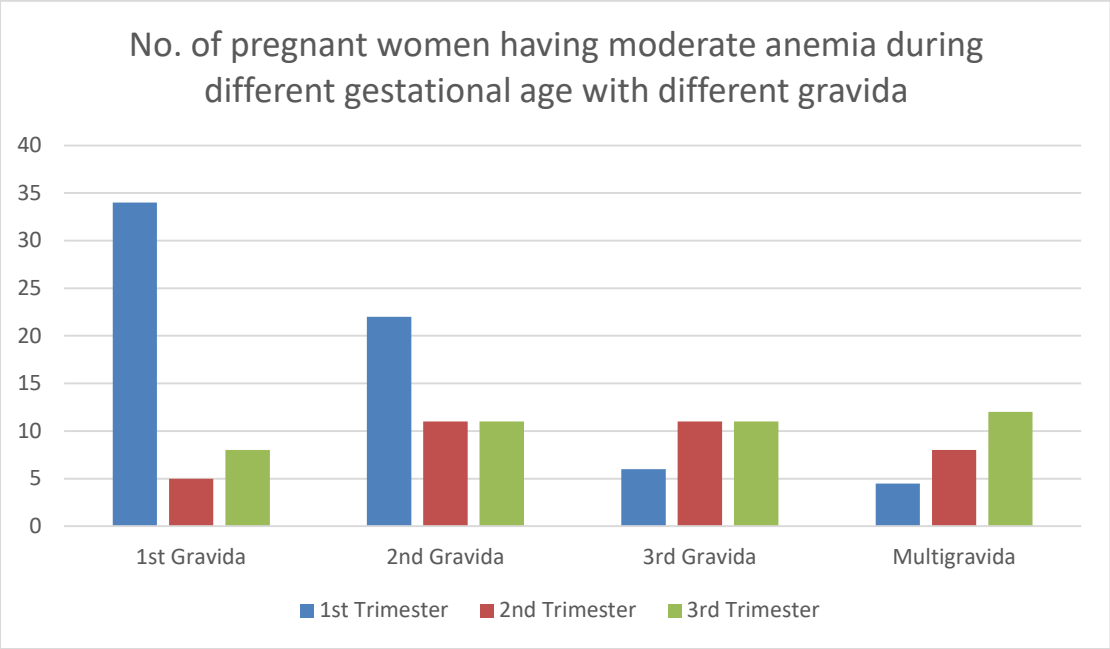

Fig. 2. Graphical distribution of pregnant women having moderate anemia during different gestational age with different gravida

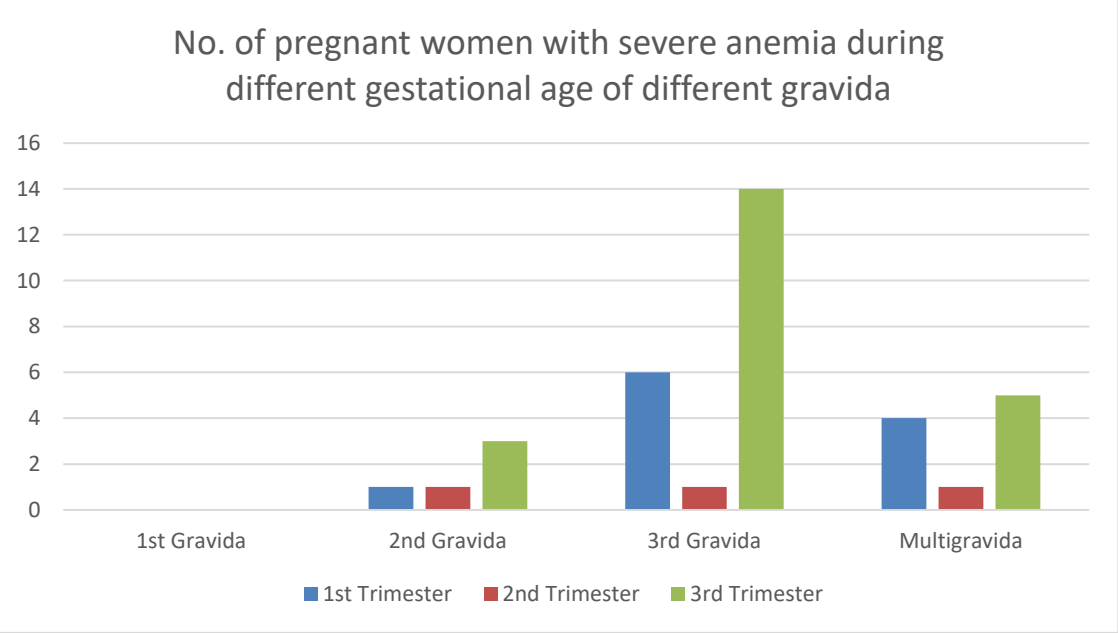

Fig. 3. Graphical distribution of pregnant women with severe anemia during different gestational age with different gravid

4. DISCUSSION

The study showed that severe anemia was more prevalent with multigravida women which is similar to the result obtained by Savaliya, et al., [5], where it is stated that multiparity itself is a major risk factor of anemia.

Also, the study conducted is in agreement with study done by Al-Farsi, et al., [9]; where also the women with higher parity showed more prevalence of anemia during pregnancy. Same result was obtained by Abdelmageed, et al., [10]; where grand multiparity was significantly associated with anemia i.e., grand multipara were 1.48 times more likely to have anemia.

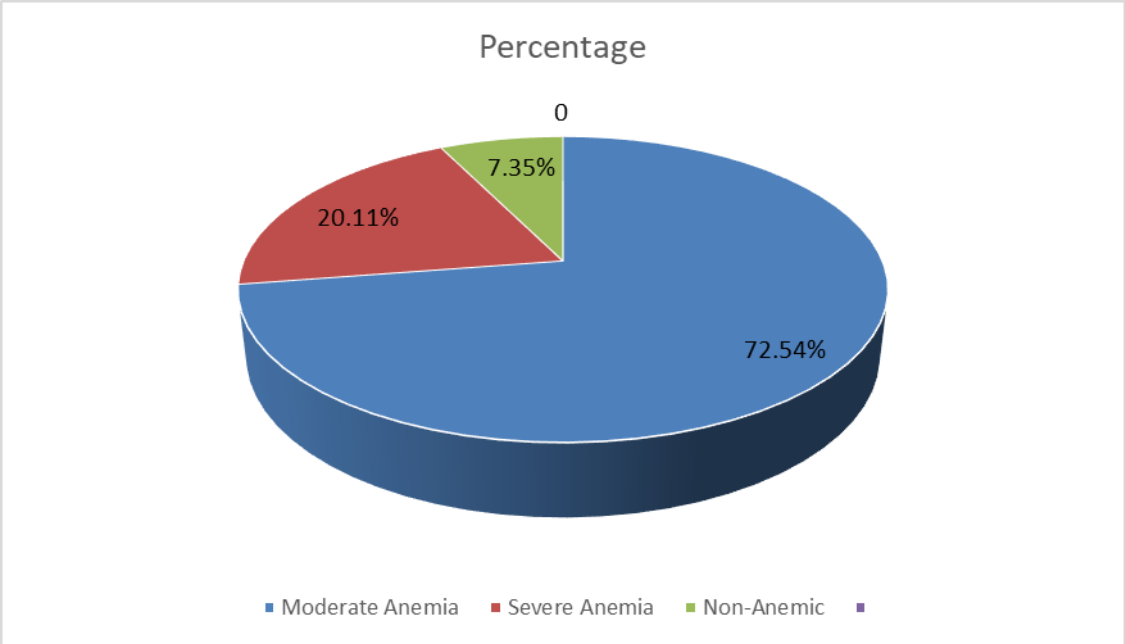

Fig. 4. Diagrammatic representation of percentage of pregnant women with different type of anemia

Similar findings were made in an Ethiopian meta-analysis, which discovered that primigravidae had a decreased incidence of anemia [11]. Also, the study we conducted similarities with the work done by Lebso, Anato and Loha in [12], where their results also showed that pregnant women with gravidity six and above were at a 2.59 higher risk for anemia.

This study showed a very high incidence of anemia in women during pregnancy i.e., 92.64%; which is similar to the result obtained by Bone, et al., [13] that was an incidence of 88.5% of anemia during pregnancy.

In the present study conducted, the prevalence of moderate anemia is about 72.55% and that of severe anemia is 20.09%, this finding is consistent with the research by Mangla and Singla [14] in a general hospital in a rural area of India named Sonipat, where they discovered that 15.88% of pregnant women had severe anemia and 37.05% had moderate anemia. This outcome is also comparable to the study by Toteja, et al. [15], in which moderate anemia was found to be prevalent in 60.1% of cases and severe anemia in 13.1%.

The present study showed that women with multiple pregnancy or multigravida had high incidence of anemia, which is in accordance with the work done by to Ahmed, et al. [16], where it was found that the possible reasons of anemia during pregnancy are gestational age, level of birth spacing, excessive blood loss in previous pregnancies or surgery. Also, study conducted by Lin, et al., [17], suggests that parity is a significant factor contributing to maternal anemia.

The study done doesn't show similarity with the one done by Karami, et al., [18], where they found a higher prevalence of mild anemia 70.8%, as there were no cases found for mild anemia in the present study.

Hemoglobinopathies are difficult to manage and control in India, where 67.0% of the population lives in rural areas. The β-thalassemias are prevalent with an estimated 7500-12000 new births each year. In the present study conducted no case of pregnant women with thalassemia was encountered, this can be attributed to the fact that very few thalassemic patients who survive till their reproductive age and if they make it up to there, they are mostly infertile. Pregnancy in women with thalassemia is possible with recent advancement in medical science but is still not available to most of the peoples and specially in India [19].

5. CONCLUSION

The findings in the study indicates that overall anemia during pregnancy is a high incidence

phenomenon i.e., 92.64% women were anemic during pregnancy, this can be due previous health issues, socio-economic status, lack of knowledge etc. Also, no cases of mild anemia were found which can be due to the fact that its symptoms are not prominent and so remain undetected. Result obtained in the study showed that anemia is least prevalent in 1st gravida women and most in multigravida women, this can be attributed to the fact of previous pregnancies and abortion, both of which contributes to blood loss. Adding on to it, nursing of new one demands increase in nutrition for the mother which are most of the time not met. Also sometimes, the generation of erythropoietin by the kidney, growth hormone from the pituitary, thyroid hormones, and other organ functions may not be sufficient to enhance RBC production in the bone marrow in situations of high demand, such as pregnancy, due to age-related changes and multigravida, all these incidences can lead to anemia during pregnancy.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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