

Study of Factors Affecting Anemia among Pregnant Women in Najaf City

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ABSTRACT

Background: This study has particular importance because it explores the relation of the results of this study with the hemoglobin level of pregnant women of various age groups and its relationship with complications in pregnancy. Anemia during pregnancy is a significant risk to the mother's and baby's health, and can cause complications like obstructed labor, postpartum hemorrhage, preeclampsia, low birth weight and birth asphyxia. The aim of this study: was to explore the differences in Haemoglobin levels of pregnant women across the different age groups and the possible relationship between Haemoglobin level and different pregnancy complications. **Methodology:** The study was undertaken using a systematic procedure for the collection of blood samples from pregnant women. After cleaning the place of blood collection with alcohol, blood was collected using disposable syringes. 2 mL of blood was then placed in a tube containing an anticoagulant and hemoglobin was analyzed with a hematocrit device. **Results:** showed significant differences in the mean level of hemoglobin according to age groups, and the younger pregnant women had lower mean levels of hemoglobin than older pregnant women. Hemoglobin levels were important to the prediction of pregnancy outcomes, with complications like abortion, obstructed labour and postpartum haemorrhage having significant associations. **In conclusion,** this study helps to clarify the complex interplay between changes in hemoglobin levels by age group in pregnant women and the development of pregnancy complications. The results highlight the need for personalised interventions and nutrition programmes to combat anaemia and improve maternal and foetal health outcomes. Further research and continued surveillance are needed. Increased interventions and optimization of the care provided for pregnant women of various ages were recommended.

Keywords: Anemia, Obstructed Labor, Pregnant Women.

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INTRODUCTION

Anemia in pregnancy is a common and significant problem of pregnancy in all pregnant women around the globe. The concept of anemia in pregnancy is very important not only for the well being of the mother but also for the foetus and the child as well (Abu-Ouf and Jan 2015).

During pregnancy, anemia is usually identified when hemoglobin is below target, as it reduces the efficiency of the blood's transport of oxygen. The causes of anemia in pregnant

women can be complex, ranging from nutritional deficiencies, physiological changes, and underlying health conditions (Balcha et al. 2023).

Iron deficiency is one of the main causes of anemia in pregnant women. Rising iron needs during pregnancy for fetal development and growth in the mother's blood volume can result in low iron levels. Also, low levels of other micronutrients like folic acid and vitamin B12 may worsen anemia in this sensitive time (Georgieff 2020).

When a pregnant woman has anemia, she and her developing baby are at risk. Maternal complications can include increased fatigue, increased risk of infection, and decreased resistance to blood loss during labor. The risks to the fetus include low birth weight, preterm birth and developmental delays (Linder and Ipe 2022).

It is essential to encourage pregnant women to eat a balanced diet that includes iron, folic acid and vitamin B12. This involves adding leafy greens, lean protein and fortified cereals to their diets. Iron and folic acid supplementation is also prescribed by healthcare professionals to correct nutritional deficiencies when diet alone is not enough, and can help ensure sufficient Hb levels (Morrison et al. 2023). Regular prenatal care is very important to help keep track of hemoglobin levels and to detect anemia early. This enables prompt action and modifications to the management plan. Comprehensive health education for the pregnant women on the significance of their nutritional intake, compliance to prescribed supplements, and also the indicators of anemia allows them to take an active role in their own health (Wakwoya et al. 2023). Finally, understanding the meaning, risk factors and possible complications of anemia in pregnancy pave the way for adequate preventive measures. By addressing nutritional deficiencies and promoting overall maternal health, healthcare providers can play a pivotal role in ensuring a safer and healthier pregnancy journey for expectant mothers.

METHODS

Study population

Patients were recruited from Maternity Obstetric Hospital and private clinics in the Al-Najaf governorate.

Subjects

A total of 255 blood samples were collected from pregnant females, who visiting the outpatient clinics in the Maternity and

Pediatrics Teaching Hospital, in addition to some private clinics in Al-Najaf city during a period from November (11) 2023 to January (4) 2024.

Statistics Analysis

Statistical Package of Social Sciences (SPSS) v23 (Inc., Chicago, IL, USA) software (Ozdamar,2005).

RESULTS

Distribution of Hemoglobin Levels Among Pregnant Women Across Different Age Groups

A 255 blood samples were collected from pregnant women. Their average age was 31.46 ± 12.06 . The ages of pregnant women were divided into age groups as shown in **Figure 1**, where the most vulnerable group was the group (28 – 32y) years old, while the least affected groups were the group (13-17y) years old.

Age Group: 13-17y

The study included 12 pregnant women in the age group 13-17y. The mean hemoglobin level for this group was found to be 8.5 g/dL with a standard deviation of ± 1.5 . This indicates a moderate level of variability in hemoglobin levels within this age range. The measured hemoglobin values suggest that these young pregnant women may be experiencing some degree of anemia, though the severity varies.

Age Group: 18-22y

This age group comprised 57 pregnant women. The mean hemoglobin level was 7.9 g/dL with a standard deviation of ± 0.9 . The lower mean hemoglobin level is relatively, indicating a higher incidence of anemia in this age level. Standard deviation of ± 0.9 shows moderate consistency in hemoglobin level but still there is variability in it.

Age Group: 23-27y

58 pregnant women aged 23-27 were studied. The mean level of hemoglobin was 9.1 g/dL for this group with a standard deviation of ± 1.3 . The mean hemoglobin value seems to be

in healthier range as it is higher and the standard deviation shows some variation.

Overall, this group appears to have better hemoglobin levels compared to the previous two age groups.

Age Group: 28-32y

In this age group, there were 59 pregnant women. The mean hemoglobin level was 8.7 g/dL with a standard deviation of ± 0.5 . The slightly lower mean hemoglobin level may indicate a mild prevalence of anemia. However, the narrow standard deviation suggests a more consistent range of hemoglobin levels within this group.

Age Group: 33-37y

The study included 44 pregnant women aged 33-37. The mean hemoglobin level was 8.8 g/dL with a standard deviation of ± 0.9 . This suggests a moderate level of consistency in hemoglobin levels, with a relatively higher mean compared to the previous age group. The variability in hemoglobin levels within this group appears to be within a moderate range.

Age Group: 38-42y

The smallest group in the study consisted of 25 pregnant women aged 38-42. The mean hemoglobin level for this group was 9.0 g/dL with a narrow standard deviation of ± 0.3 . The higher mean and low standard deviation indicate a more uniform and healthier range of hemoglobin levels within this age group.

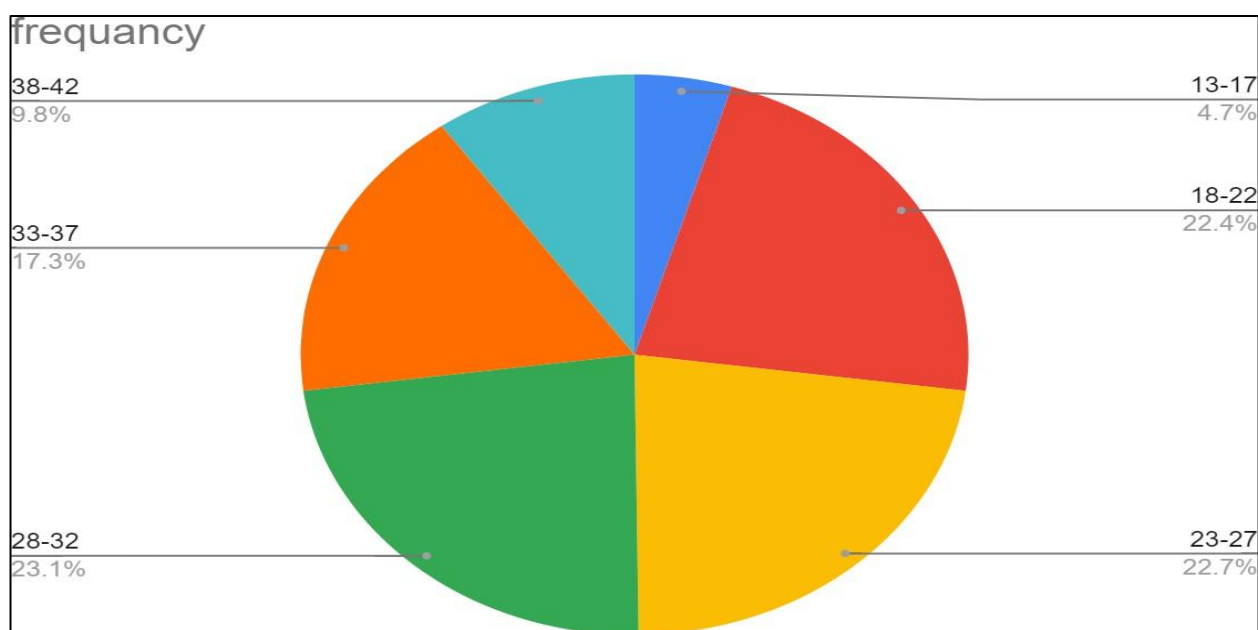


Figure (1) Distribution of Hemoglobin Levels Among Pregnant Women Across Different Age Groups.

Table 1 reveals age-related variations in hemoglobin (HGB) levels among pregnant women. Specifically, the mean HGB of the youngest age group (13-17y) was 8.5 g/dL, and the mean HGB of the oldest age group (38-

42y) was 9.0 g/dL. The mean HGB level was a cause for concern in the age group with the highest frequency (18-22y) with a value of 7.9 g/dL, suggesting nutritional problems.

Table 1: Distribution of Hemoglobin Levels Among Pregnant Women Across Different Age Groups.

Class	Frequency	HGB(g\dl) M $\pm$ STD
13-17y	12	8.5 $\pm$ 1.5
18-22y	57	7.9 $\pm$ 0.9
23-27y	58	9.1 $\pm$ 1.3
28-32y	59	8.7 $\pm$ 0.5
33-37y	44	8.8 $\pm$ 0.9
38-42y	25	9.0 $\pm$ 0.3

Complications and Anemia

The results in **Table 2** illustrate the distribution of pregnant women by complications and anemia status:

Abortion

Eighty percent (12 out of 15) of the pregnant women who had an abortion were found to be anemic. This shows a very important link between anemia and the occurrence of abortion in the population studied. The high percentage suggests that anemic status may be a contributing factor to the incidence of abortion.

Obstructed Labor

40% (4 out of 10) of the women with obstructed labor were found to be anemic. This finding indicates a moderate association between anemia and the occurrence of obstructed labor, suggesting that pregnant women with low levels of hemoglobin are at a higher risk of developing this complication. Women may be at a relatively higher risk of experiencing complications from obstructed labor.

Postpartum Hemorrhage (PPH)

In the anemic group, 86% (6/7) of the women had postpartum hemorrhage. This high percentage strongly suggests a relationship between anemia and the onset of postpartum hemorrhage. Anemic status could be a major

causative factor in the risk of postpartum hemorrhage.

Preeclampsia

Preeclampsia was diagnosed in 71.4% (5 out of 7) of the women who were found to be anemic. This high percentage of association between anemia and the development of preeclampsia is significant. It can be concluded that anemic women have a higher risk of developing preeclampsia as compared to non-anemic women.

Low Birth Weight (LBW) Babies

In cases of low birth weight babies, 57% (62 out of 109) of mothers were anemic. This result shows a significant association between maternal anemia and the chances of giving birth to babies with low birth weight. This may put anemic pregnant women at increased risk of giving birth to infants with low birth weight.

Birth Asphyxia

All cases of birth asphyxia (100%, 7 out of 7) occurred in mothers who were identified as anemic. This strong association suggests that anemic status in pregnant women may be a critical factor contributing to the occurrence of birth asphyxia. Addressing maternal anemia may play a crucial role in preventing birth asphyxia in newborns.

Table 2: Pregnant women with complications and anemia status distribution.

Complications	Percentage of Anemic Women
Abortion	80%(12/15)
Obstructed labor	40%(4/10)
Postpartum hemorrhage (PPH)	86%(6/7)
Preeclampsia	71.4%(5/7)
Low birth weight (LBW) babies	57%(62/109)
Birth asphyxia	100%(7/7)

DISCUSSION

The low levels of HGB in this group could be due to continuous physiological changes in adolescence, which increase the body's need for iron. It is this quick growth period that may lead to nutritional deficiencies that can contribute to anemia. A previous study (Annan et al. 2021) has linked with adolescent pregnancy to the increased risks of anemia in the adolescent girls due to enhanced nutritional needs.

In the population with the highest frequency the mean HGB for the 18-22 age groups was the lowest, The blood glucose levels are at 7.9 g/dl which indicates some nutritional issues may be present. A higher prevalence of anemia may be due to poor access to balanced diets or socio-economic factors. The same socio-economic factors were also associated with anemia in pregnant adolescents in another study (Sagalova et al., 2021).

The mean HGB levels of these age groups were relatively more healthful (9.1 g/dL and 8.7 g/dL, respectively). Optimum nutrition and physiological maturity may be contributing factors for hemoglobin status. Previous studies (Sunuwar et al. 2019) have highlighted the importance of balanced nutrition for healthy hemoglobin levels during pregnancy.

The moderate variation in the mean HGB observed (8.8 g/dL) indicates a balance

between physiological and nutritional factors. Interventions that are tailored with this variability in mind may be helpful. Alabduljabbar et al. (2021) noted the same variations in the level of hemoglobin among the pregnant women and highlighted the need to develop individual approach.

The older age group had higher mean HGB concentration (9.0 g/dL) which could be associated with higher nutritional awareness and better health care services. This is consistent with (Dutta et al. 2023), but further studies are needed to identify specific factors that affect the levels of hemoglobin in older pregnant women.

CONCLUSIONS

The study's examination of hemoglobin levels across different age groups revealed significant variations. Younger age groups, particularly 13-17 and 18-22, exhibited lower mean hemoglobin levels, suggesting potential vulnerabilities. On the contrary, older age groups, especially 38-42, displayed higher mean hemoglobin levels, emphasizing a potential age-related trend.

RECOMMENDATIONS

We recommend intensifying studies in this area, in addition to considering other indicators. We also recommend that the study

be broader and more comprehensive in the future to gather more information and results.

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Conflicts of interest

There are no conflicts of interest

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