# Frequency of Anemia in Women with Preterm Labour

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**Abstract**

**Objective:** To determine the frequency of anemia in women experiencing preterm labor, recognizing the critical association between anemia and adverse maternal and perinatal outcomes.

**Materials and Methods:** This cross-sectional study was done from September 2023 to November 2023 after approval from the Institutional Review Board IRB NO. MRC/1RB/23017. After informed consent 192 pregnant females were included after Institutional Review Board approval. A self-developed questionnaire gathered sociodemographic data, and hemoglobin levels were measured. Statistical analysis employed SPSS version 23, utilizing chi-square for comparisons.

**Results:** Among the 192 participants, 27.1% were anemic. Bivariate analysis revealed a significant association between anemia and rural residence (p=0.012). No significant correlation was found with other sociodemographic factors.

**Conclusion:** The study emphasizes the high frequency of anemia in women experiencing preterm labor, supporting the need for heightened public awareness and early screening initiatives. Maternal anemia significantly correlates with preterm births, emphasizing the importance of managing gestational anemia to mitigate adverse outcomes. Public health interventions should target women of reproductive age and healthcare providers to ensure timely screening and management of maternal anemia, ultimately contributing to the reduction of preterm births and associated complications.

**Keywords:** Anemia, iron-deficiency, preterm birth, maternal health, perinatal outcomes, public health, gestational anemia, sociodemographic factors, hemoglobin levels, pregnancy complications, public awareness.

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## Introduction

Anemia is a condition where the body has lower than normal levels of hemoglobin, leading to decreased oxygen-carrying capacity of red blood cells.[1] Pregnant women are more vulnerable to anemia, with global prevalence rates of 42%. Iron deficiency is the primary cause of anemia in pregnancy, accounting for around 95%. Anemia during pregnancy can lead to poor maternal and fetal outcomes, including preterm labor, pre-eclampsia, sepsis, and postpartum hemorrhage.[2] Preterm labor refers to the onset of regular uterine contractions before the 37th week of pregnancy, leading to the opening of the cervix and ultimately resulting in the birth of a baby that is not fully developed.[3] This can pose significant health risks to the baby, as they may not be fully capable of breathing, feeding, and regulating their body temperature without medical assistance.[4] Iron deficiency and hypoxia, caused by anemia, can lead to maternal and fetal stress, which raises norepinephrine levels in serum, inducing maternal and fetal stress. This stress stimulates the synthesis of corticotrophin-releasing hormone (CRH), which is a major

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risk factor for preterm labor.[5] Preterm deliveries are a significant public health challenge with far-reaching effects, constitute a major cause of long-term morbidity and perinatal mortality. Over half of all cases of long-term morbidity are associated with preterm deliveries, while 75% of perinatal deaths result from prematurity.[6] A study conducted in Abbottabad showed that 41.5% of the patients with preterm labor had iron deficiency anemia.[5] While according to Frayne et al preterm labour was observed in 25% percent of anemic pregnant women in Australia, while in Tasmania, there is a prevalence of 18% of Iron Deficiency Anemia (IDA) among expectant women. This study highlights the importance of monitoring and addressing the issue of IDA during pregnancy.[7] Moreover preterm infants are at heightened risk of developing respiratory, gastrointestinal, and cognitive issues, which can have long-lasting implications for their overall health and well-being[6] Therefore, it is important to manage gestational anemia before it leads to far-reaching complications. The WHO guidelines define anemia during pregnancy as hemoglobin levels below 110g/L.[8] As the previous studies have shown variation in the frequency of anemia in women with preterm labour So, based on these results, public awareness can be created regarding this major public health issue among pregnant women as well as treating clinicians for a better future outcome in every aspect to reduce adverse maternal and perinatal outcomes.

## Material and Method

This cross-sectional study was done from September 2023 to November 2023 after approval from the Institutional Review Board IRB NO. MRC/1RB/23017. After informed consent pregnant females were included in our study. Those not giving consent were excluded from the study. A sample size9 of 192 was used using a 95% confidence interval and 5% margin of error. The questionnaire was self-developed after literature search. Questionnaire was filled by an interview. Hemoglobin test was done as per standard protocols. Hemoglobin less than 11mg/dl was categorized as anemics. Consecutive sampling was done till the completion of the sample size. The sample was completed using convenience sampling.

SPSS version 23 was used to enter, code, and analyze the gathered data. For age mean and standard deviation was calculated. Chi-square was used to compare the sociodemographic characteristics of anemics and non-anemics. A p-value less than 0.05 was taken as significant.

## Results

A total of 192 pregnant females in the study had a mean age of 28.14 years with a standard deviation of 5.88

**Table 1:** *Socio-demographic characteristics of study respondents n= 192.*

| Variables | Frequency (n) | Percentage (%) |
|---|---|---|
| **Age** | | |
| Less than 30 years | 142 | 74.0 |
| More than 30 years | 50 | 26.0 |
| **Educational Status** | | |
| Below matriculation | 136 | 70.8 |
| Matriculation | 4 | 2.1 |
| Graduate | 52 | 27.1 |
| **Residence** | | |
| Urban | 80 | 41.7 |
| Rural | 112 | 58.3 |

**Table 2:** *Bivariate analysis to compare sociodemographic profile of anemics and non-anemics*

| Variables | | Anemics N=52 | Non-Anemics N=140 | P-value |
|---|---|---|---|---|
| Parity | Less than 2 | 22 (42.3%) | 72 (51.4%) | 0.261 |
| | More than 2 | 30 (57.7%) | 68 (48.6%) | |
| Gestational Age | Less than 28 weeks | 26 (50%) | 80 (57.1%) | 0.376 |
| | More than 28 weeks | 26 (50%) | 60 (42.9%) | |
| Place of Residence | Urban | 14 (26.9%) | 66 (41.1%) | **0.012** |
| | Rural | 38 (73.1%) | 74 (52.9%) | |
| History Of Preterm | Yes | 16 (30.8%) | 64 (45.7%) | 0.062 |
| | No | 36 (69.2%) | 76 (54.3%) | |
| Education | Below matriculation | 38 (73.1%) | 98 (70.0%) | 0.464 |
| | Matriculation | 0 (0.0%) | 4 (2.9%) | |
| | Graduate | 14 (26.9%) | 38 (27.1%) | |
| Age | Less than 30 years | 34 (65.4%) | 108 (77.1%) | 0.099 |
| | More than 30 years | 18 (34.6%) | 32 (22.9%) | |
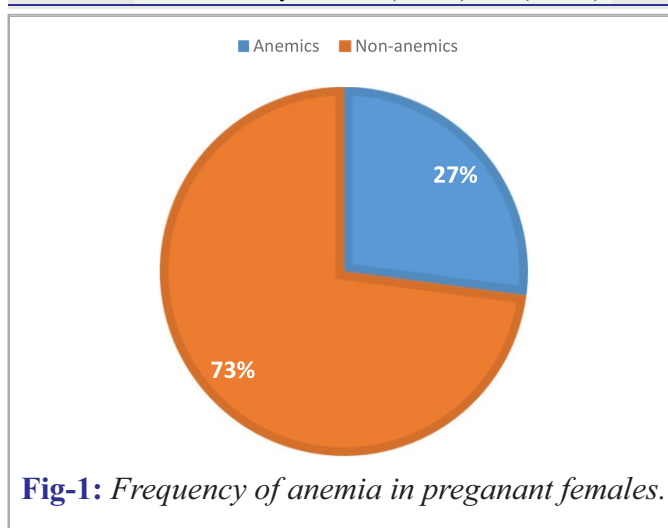


**Fig-1:** *Frequency of anemia in preganant females.*

years. The sociodemographic characteristics of study participants are shown in table. Bivariate analysis was done to compare sociodemographic characteristics of anemics and non-anemics as shown in Table 2. Anemics were significantly higher in rural residence. P-value 0.012. In this study there were 52 (27.1%) anemics and 140 (72.9%) were not categorized as anemics as shown in Figure 1.

## Discussion

Globally, anemia during pregnancy is thought to affect 41.8% of pregnant women. The mean age of our participants is $28 \pm 5.8$, whereas in a study conducted in India the median age of 388 females with diagnosis of pregnancy during first trimester was 27 years.[10] Out of the total study population,112(58.3 %) lived in urban areas whereas 80(41.7%) resided in rural areas whereas in another study conducted in India 270 (69.58%) were from rural and 118 (30.41%) were from urban back-ground.[11] Ninety-four (49%) of the pregnant ladies were para 2 whereas 89(51%) were para 3 and 4 whereas in British Columbia 264 patients had anemia, 87 (32.95%) patients were primigravida and 177 (67.04%) were multiparous females.[12]

Frequency of anemia in preterm labor was found in 52 (27.1%) patients. Studies have showed association of maternal anemia in pregnancy with increased risk of delivery of premature and low birth weight babies.[13] Research has been conducted to understand how anemia may predispose to preterm labour either directly or indirectly due to increased risk of infection. The direct effect is related to increased synthesis of corticotrophin releasing hormone as a result of tissue hypoxia. In various studies, frequency of anemia in patients with preterm labor was found to be 58.0%.[14]

In another study conducted in Turkey, frequency of anemia in patients with preterm labor was found to be 48.6%.[15] Anemia was significantly associated with resi-dence in rural area (p=0.012), similarly in a study con-ducted in India 61% of the rural population had anemia.[16] Half of the anemic females were of less than 28 weeks of gestation and half were more similarly in a study conducted in Canada 67% of the participants had anemia before 28 weeks of gestation.[17] There was no association found between level of education with anemia in this study, whereas in a study conducted in Ethopia a signifi-cant association <0.05 was found between no education and prevalence of anemia.[18]

In this study, 30% of the anemics had history of preterm labour. The overall relationship between maternal anemia during pregnancy and premature birth was significant (1.56 [95% CI: 1.25–1.95]) in a metanalysis which showed that premature birth and labour is a risk factor of anemia. Anemia is the most frequent blood disorder occurring during pregnancy and can result in complications during pregnancy.[19]

## Conclusion

This study concluded that frequency of anemia in women with preterm labour is quite high. So, we recommend that public awareness programs should be arranged regarding this major public health issue among women of reproductive age group as well as treating clinicians for early screening and management of maternal anemia in order to reduce the preterm birth

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## Authors Contribution

**SN:** Conceptualization of Project
**HA:** Data Collection
**AM, HA:** Literature Search
**QAZ:** Statistical Analysis
**AS:** Drafting, Revision
**SK:** Writing of Manuscript