

# PREVALENCE AND RISK FACTORS ASSOCIATED WITH ANEMIA AMONG PREGNANT WOMEN IN A TERTIARY CARE HOSPITAL

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## **Abstract:**

The Objectives of our study was to determine the prevalence of anemia and the factors affecting hemoglobin status among pregnant women. Anemia majorly affects the developing countries causing maternal and fetal morbidity and mortality. According to WHO, prevalence of anemia in pregnant women in developed and developing countries is 14% and 51% respectively. This was a retrospective study conducted for a period of 9 months in the Department of Obstetrics and Gynecology at GMC, Amritsar, Punjab. A total of 1124 patients were enrolled in the study after taking written and informed consent. The hemoglobin was measured by automated cell counter method and those with hemoglobin level <11 g/dl were considered as anemic and included in the study. The data was collected from registers maintained in our department. In our study, overall prevalence of anemia among pregnant women getting admitted to our IPD was 78.2%. Patients mostly belonged to mild category being 67.1%. 23.4% patients were under moderate category whereas 7.2% and 2.3% were in severe and very severe categories respectively. Age, education status, occupation, no. of pregnancies, no. of abortions and family size were the factors associated with anemia in pregnant women. This continuing high burden of anemia is due to various socioeconomic and obstetric factors. Faulty dietary habits and lack of knowledge of iron rich food also contributes to anemia. Another cause is lack of utilization of resources provided under various programmes by Govt. of India. So to deal with this problem, pressing steps should be taken.

**Keywords:** Anemia, pregnancy, prevalence

## INTRODUCTION

Anemia is the decrease in oxygen carrying capacity of blood. Anemia is a major health problem affecting majorly the developing countries. It has major consequences on human health. It affects all age groups but pregnant women and children are most susceptible. Anemia is considered as a major cause of maternal and fetal morbidity and mortality in developing countries [1]. 41.8% of pregnant and 30.2% of non-pregnant women are anemic [2]. According to WHO, prevalence of anemia in pregnant women in developed and developing countries is 14% and 51% respectively. India contributes to about 80% of maternal death due to anemia in South Asia [3]. According to WHO, anemia is defined as Hemoglobin <11 g%. It is classified as mild 10-10.9 g%, moderate 7-9 g%, severe <7 g% according to hemoglobin concentration [3]. Anemia leads to premature birth, low birth weights, fetal cognitive impairment and even fetal death during pregnancy [4]. Maternal complications include pre-eclampsia, antepartum hemorrhage, puerperal sepsis, thromboembolic complications, subinvolution, failure of lactation and delayed wound healing. Most common nutritional disorder in the world is Iron Deficiency Anemia. It affects 2 billion people worldwide [5]. Identification of risk factors contributing to anemia in pregnant mothers is important to prevent maternal and fetal complications.

Due to the abundant burden of anemia in our country, many maternal health programmes have been introduced by the Govt. of India, but anemia reduction is lower than expected compared to South Asian countries [6]. This is due to lack of utilization of resources provided under various programmes by GOI. This may be because of lack of awareness which contributes towards anemia [7]. Thus, this study was taken up to establish evidence-based information on prevalence of anemia and factors affecting anemia among pregnant women.

## OBJECTIVES

The objectives of this study were as follows:

1. To determine the prevalence of anemia among pregnant women.
2. To determine the factors affecting hemoglobin status among pregnant women.

## MATERIALS AND METHODS

This was a retrospective study conducted in the Department of Obstetrics and Gynecology at GMC, Amritsar, Punjab. The study was conducted for a period of 9 months. Inclusion and exclusion criteria were defined. Inclusion criteria included all the antenatal patients requiring admission for obstetric reasons and exclusion criteria being patients with antepartum hemorrhage, coagulopathies, chronic liver and renal disorder. A total of 1124 patients who meet the inclusion and exclusion criteria were enrolled in the study after taking written and informed consent. The hemoglobin was measured using automated cell counter method and those with hemoglobin level <11 g/dl were considered as anemic and were investigated further to be assessed according to the Indian Council of Medical Research (ICMR) classification. Data were collected using pre-designed and pre-tested structured questionnaire. Questionnaire was both in English and local language. All the questionnaires were checked for completeness and consistency on a daily basis. The data were collected by studying the admission and birth registers maintained in the

department. Various details like sociodemographic data, obstetric factors and hemoglobin status were noted. The data were analyzed for using Statistical Package for the Social Sciences 18.0 version.

## RESULTS

In our study, overall prevalence of anemia among pregnant women getting admitted to our IPD was 78.2%. As shown in Table 1, among 1124 anemic patients included in the study, majority i.e. 620 women (55.2%) were in the prime age group of 20-30 yrs, 11.4% patients were in the < 20 yrs age group and 33.4% patients were in the age group of 30 years and above. Most of the patients were illiterate with literacy rate of 37.6%. According to the occupation 86.4% patients were homemaker and 13.6% were either laborer or employees. According to the religion, most of the patients were Sikh and Hindus being 54.8% and 42.4% respectively but very few belonged to other religion

**Table 1: Sociodemographic characteristics of antenatal anemic women (n= 1124)**

Age	n (%)
<20 yrs	128(11.4%)
20-30 yrs	620(55.2%)
>30yrs	376(33.4%)
Education status	
Literate	423(37.6%)
Illiterate	701(62.4%)
Occupation	
Homemaker	971(86.4%)
Laborer/Employee	153(13.6%)
Religion	
Sikh	616(54.8%)
Hindu	477(42.4%)
Muslim	20(1.8%)
Others	11(1%)

Table 2 shows prevalence of anemia according to obstetric factors. Anemia was assessed according to gravida, prior history of abortions and family size. There were almost similar no. of patients in primigravida and multigravida group but slightly higher in multigravida group (58.6%) than primigravida group (41.4%). More than 2/3 rd of patients had history of prior abortions (77.3%) with 22.7% who had no abortions. Anemia was more prevalent in patients with family size more or equal to 2 (64.1%) but when family size was less than 2, 35.9 % patients were found to be anemic.

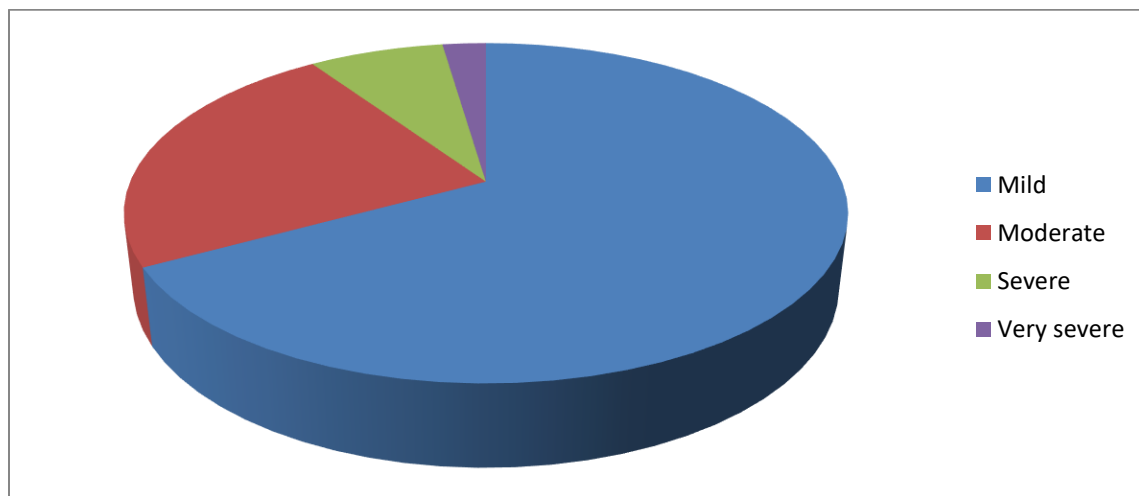
**Table 2: Obstetric factors of antenatal anemic women (n= 1124)**

Gravida	n (%)
Primigravida	465(41.4%)
Multigravida	659(58.6%)
Abortions	
No	255(22.7%)
Yes	869(77.3%)
Family size	
<2	404(35.9%)
≥2	720(64.1%)

Table 3 shows the degree of anemia and the prevalence. Anemia was characterized into mild, moderate, severe and very severe category. Patients mostly belonged to mild category being 67.1% in this group. 23.4% patients were under moderate category whereas 7.2% and 2.3% were in severe and very severe category respectively. Figure 1 pictorially represents burden of anemia according to category.

**Table3: Severity of anemia in antenatal anemic women (n= 1124)**

Severity of anemia	n (%)
Mild	754(67.1%)
Moderate	263(23.4%)
Severe	81(7.2%)
Very Severe	26(2.3%)

**Fig 1: Severity of anemia in antenatal anemic women (n= 1124)**

## DISCUSSION

Anemia is major health problem affecting especially pregnant women. This problem of anemia is more rampant in developing countries than developed countries. Anemia in pregnancy adversely affects the pregnant patients and also causes harmful effects on fetus like IUGR, prematurity, depleted iron stores in body. In the postpartum period it can cause subinvolution of uterus, secondary PPH and failure of lactation.

In our study overall prevalence of anemia among pregnant women using WHO cut-off criteria of Hemoglobin concentration of 11 g/dL was 78.2%. Nutrition foundation of India and ICMR task Force has observed prevalence of 84% and 84.9% respectively [2,8]. In a study by Agarwal KN et al, they observed that >90 per cent of women were anemic in pregnancy and lactation [9]. According to WHO; prevalence of anemia is 18% among pregnant women in the developed countries. Higher literacy rate, better socioeconomic conditions and better utilization of health facilities seems to an important factor leading to decrease in prevalence of anemia.

In our study most of the pregnant women who were anemic belonged to age group of 25-35 yrs which is similar to the study by Suryanarayana R et al. In their study the prevalence of anemia was 62.3% in pregnant women, and it was observed that anemia was common in the age group of 21–30 years [10]. In yet another study by Qadir MA et al, they saw no significant difference among different age groups with prevalence of anemia, but numerically higher observations were recorded in the age groups of less than 30 years [11]. This may be because of repeated pregnancies and short interpregnancy interval which hampers the repletion of iron stores and leads to anemia.

In a study by Mangla et al, they found that the prevalence and severity of anemia was higher in illiterate patients. [12]. The high prevalence of anemia was strongly associated with low socioeconomic status and hence their attitude for knowledge and health seeking. This is in collaboration to our study in which we saw that 62.4% anemic patients belong to illiterate group. The patients who are never exposed to education miss the chance of acquiring the knowledge of major health problems. Due to lack of awareness, they are less likely to approach health care facilities in hour of need. So to pay attention to this issue, Government of India has launched various programmes to educate and correct anemia which starts at school level.

In our study most of the anemic women were homemaker by occupation. This may be because women tend to neglect their own health and healthy eating habits as they don't find time being engaged in household chores and taking care of family and children. This in turn leads to anemia and more chances of complications. In one study by Sharma *et al.*, 62% patients who had anemia were Hindus by religion [13]. Most of our anemic patients were Sikhs and Hindus being 54.8% and 42.4% respectively. This may be because this study was carried out in Amritsar, Punjab, which is a Sikh and Hindu dominated area. Thus chances of inclusion bias are present.

In a study by Nair et al, the prevalence of anemia was found to be more common in antenatal women with two abortions [14]. In our study also prevalence was more in patients with history of Abortions. Also in Uche-Nwachi EO et al study there was a positive correlation between the number of spontaneous abortions and the likelihood of developing anemia at final hemoglobin reading [15]. The positive association with anemia seems to be because

abortion causes acute blood loss, which depletes stores of iron in the body. Most of the patients conceive soon after abortion, hence adequate time is lacking for repletion of body stores.

According to the results of our study, anemia was more prevalent when no. of children were  $\geq 2$ . In another study pregnant mothers who had been living within a family of more than four members were more likely to be anemic compared to those living with  $< 2$  family members [16]. In yet another study which was conducted in Jordan, anemia prevalence between groups of pregnant mothers living with different family sizes were statistically not significant. This may be because in this study, variation in family size was less and this may have led to final results [17].

Studies have also been conducted about association of child spacing with anemia in pregnant women. In a study in Westmoreland Jamaica, they saw that child spacing of  $< 2$  years was a major factor associated with anemia in pregnancy. Furthermore, a study in Westmoreland Jamaica (1999) identified child spacing of less than two years as a major factor associated with anemia in pregnancy [15]. According to a study as the parity level increases the incidence of anemia in pregnancy also increases, with primigravida women showing an incidence of only 46.00% while multigravida women showed a much higher incidence of 70.67% [18]. This study is in concordance with our study in which multigravida had higher prevalence of anemia than primigravida. Multigravida patients due to repeated pregnancies and less space interval between pregnancies gets less chances to restore their reserves of iron so has more chances of developing anemia.

In a study by Shi H et al, 18 948 443 pregnant women were studied and mean age was 29.42 years. The prevalence of anemia was found to be 17.78%. 9.04% had mild anemia, 2.62% had moderate anemia, 0.21% had severe anemia, and 5.90% had anemia of unknown severity [19]. In yet another study by Stephan et al, they saw that most of the pregnant women falls into mild and moderate category being 42.2% and 45.2% respectively. Patients belonging to severe category were 12.6% [20]. In our study, patients mostly belonged to mild category being 67.1%. 23.4% patients were under moderate category whereas 7.2% and 2.3% were in severe and very severe category respectively. So most of patients belonging to mild and moderate category can be managed on OPD basis, but patients having severe and very severe anemia require admission and aggressive management as these patients are more likely to develop all types of complications.

## CONCLUSION

In our study, the prevalence of anemia among pregnant women was high. Various factors like, socioeconomic status, occupation, educational status, dietary intake of iron rich foods and tablets contribute to high burden of anemia in developing countries. Another cause is lack of utilization of resources provided under various programmes by Govt. of India. This may be because of lack of awareness among general population which finally contributes towards anemia [7]. Accessing the knowledge regarding anemia, nutrition, availability of various free governmental services, and importance of spacing between the pregnancies on health of the mother and the baby and educating about the

same may improve prevalence of the anemia. There is a need to implement anemia control program more aggressively because anemia in pregnancy is associated with increased maternal and fetal morbidity and mortality. The ultimate objective is to treat anemia through early diagnosis. Various measures to prevent anemia include screening programs for anemia, health awareness campaigns, frequent visits by ASHA/ANM workers to pregnant women. Simple measures like cooking food in iron utensils, fortification of food with iodized salt, and iron folic acid supplements goes a long way in improving maternal health. All these steps ultimately help to ensure safe motherhood and achieve the target development goals of the millennium set by Government of India.

## REFERENCES

1. Benoist D et al. Worldwide Prevalence of Anaemia: WHO Global Database Onanaemia Geneva: World Health Organization Press; 2008. p. 1993-2005
2. Toteja GS, Singh P, Dhillon BS, Saxena BN, Ahmed FU, Singh RP, Prakash B et al. Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. Part 1 Report of ICMR task force study Food Nutr Bull. 2006 Dec;27(4):311-5.
3. WHO. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Vitamin and Mineral Nutrition Information System: Geneva, World Health Organization;2011. .
4. Levy A, Fraser D, Katz M, Mazor M, Sheiner E. Maternal anemia during pregnancy is an independent risk factor for low birth weight and preterm delivery. Eur J Obstet Gynecol Reprod. 2005;122:182-6.
5. WHO Guideline Daily Iron and Folic Acid Supplementation in Pregnant Women. Geneva: World Health Organization; 2012.
6. Kaur IP, Kaur S. A comparison of nutritional profile and prevalence of anemia among rural girls and boys. J Exerc Sci Physiother 2011;7:11-8.
7. Shwetha, & Prasad, K N. (2018). Prevalence of anemia among pregnant women - A cross-sectional study. Int J Med Sci Public Health. 2018; 7(12): 1023-1026
8. World Health Organization. The Prevalence of Anaemia in Women: A Tabulation of Available Information. Geneva: World Health Organization; 1992. p. 2.
9. Agarwal KN, Agarwal DK. Prevalence of anaemia in pregnant and lactating women in India. Indian J Med Res 2006;124:173-84..
10. Suryanarayana R, Chandrappa M, Santhuram AN, Prathima S, Sheela SR. Prospective study on prevalence of anemia of pregnant women and its outcome: A community based study. J Family Med Prim Care. 2017 Oct-Dec;6(4):739-743.
11. Qadir MA, Rashid N, Mengal MA, Hasni MS, Kakar SUD, Khan GM, Shawani NA, Ali I, Sheikh IS, Khan N. Iron-Deficiency Anemia in Women of Reproductive Age in Urban Areas of Quetta District, Pakistan. Biomed Res Int. 2022 Feb 9;2022
12. Mangla M, Singla D. Prevalence of anaemia among pregnant women in rural India: a longitudinal observational study. Int J Reprod Contracept Obstet Gynecol 2016;5:3500-5.

13. Sharma P ,Seema M, Ranjana N. Prevalence of anemia and socio-demographic factors associated with anemia among pregnant women attending antenatal hospital in Jaipur city, India. *Age (Omaha)*. 2013;20:20-5.
14. Nair MS, Raphael L, Chandran P. Prevalence of anaemia and associated factors among antenatal women in rural Kozhikode, Kerala. *Journal of Family Medicine and Primary Care* 11(5):p 1851-1857, May 2022.
15. Uche-Nwachi EO, Odekunle A, Jacinto S, Burnett M, Clapperton M, David Y et al. Anaemia in pregnancy: associations with parity, abortions and child spacing in primary healthcare clinic attendees in Trinidad and Tobago. *Afr Health Sci*. 2010 Mar;10(1):66-70.
16. Melku M, Addis Z, Alem M, Enawgawet B. Prevalence and Predictors of Maternal Anemia during Pregnancy in Gondar, Northwest Ethiopia: An Institutional Based Cross-Sectional Study. *Anemia*. 2014; 108593.
17. L. Al-Mehaisen, Y Khader, O Al-Kuran, FA Issa, Z Amarin et al. "Maternal anemia in rural Jordan: room for improvement," *Anemia*, vol. 2011, Article ID 381812, 7 pages, 2011.
18. Ramesh B, Praveen S, Jennifer J. "Multigravidity a Major Risk Factor of Anaemia in Pregnancy and its Comparison in Primigravida Women in Raichur". *National Journal of Laboratory Medicine*. 2017 Oct, Vol-6(4): PO22-PO27
19. Shi H Chen L, Wang Y, Sun M, Guo Y, Ma S et al. Severity of Anemia During Pregnancy and Adverse Maternal and Fetal Outcomes. *JAMA Netw Open*. 2022;5(2)
20. Stephen G, Mgongo M, Hussein Hashim T, Katanga J, Stray-Pedersen B, Msuya SE. Anaemia in Pregnancy: Prevalence, Risk Factors, and Adverse Perinatal Outcomes in Northern Tanzania. *Anemia*. 2018 May 2;2018