Biomedical and Biopharmaceutical Research
Abbreviation: Biomed. Biopharm. Res.
Volume: 16: Issue: 02 |Year: 2019
Page Number: 35-40

A Study on the Prevalence of Anaemia in Pregnancy and Its Role as a Risk Factor for Low Birth Weight in Term Pregnancies: Hospital-based cross-sectional study

Dr. Shraddha Shivaji Talekar[1], Dr. Himanshu Shekar[2], Dr. Amitava Dutta[3], Dr. Naresh Kumar Munda[4]

[1] Associate Professor, Department of Obstetrics & Gynaecology, Faculty of Faculty of Jagannath Gupta Institute of Medical Sciences and Hospital, West Bengal.

[2] Assistant Professor, Department of Pathology, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

[3] Assistant Professor, Department of Pathology, Faculty of Dr. VRK Women's Medical College, Telangana, India

[4] Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Corresponding Author

Dr. Naresh Kumar Munda

Assistant Professor, Department of Community Medicine, Faculty of Icare Institute of Medical Sciences and Research and Dr. B C Roy Hospital, Haldia, India

Received: 17-11-2019

Accepted: 07-12-2019

Published: 23-12-2019

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Abstract

Background: Anemia during pregnancy is a major public health concern, especially in developing countries. It has been associated with adverse outcomes including low birth weight (LBW), preterm labor, and perinatal mortality. Objective: To estimate the prevalence of anemia in pregnant women and determine whether anemia is a significant risk factor for low birth weight in term pregnancies. Methods: A cross-sectional observational study was conducted on 38 pregnant women who delivered at term. Hemoglobin levels were measured, and newborn birth weights recorded. Anemia was defined as Hb <11 g/dL. Maternal demographics, risk factors, and outcomes were analyzed. Results: Prevalence of anemia was found to be 63.2%. Among the anemic group, 58.3% of babies had low birth weight (<2.5 kg), compared to 14.3% in the non-anemic group. Anemia showed a significant association with low birth weight. Conclusion: Anemia in pregnancy is highly prevalent and significantly associated with low birth weight in term deliveries. Screening and timely management are crucial to improving neonatal outcomes.

KEYWORDS: Anaemia, pregnancy.

INTRODUCTION

Anemia, particularly iron deficiency anemia, is a common complication of pregnancy, affecting nearly 50% of pregnant women globally. In India, the prevalence is higher due to nutritional deficiencies, poor socioeconomic conditions, and lack of early antenatal care. Anemia in pregnancy reduces oxygen-carrying capacity, impacting fetal growth and development. Low birth weight (LBW), defined as a weight less than 2.5 kg at birth, is a major contributor to neonatal morbidity and mortality. Anemia during pregnancy is a common issue, affecting roughly 37% of pregnant women globally[1].

The World Health Organization defines anemia in pregnancy as a hemoglobin concentration below 11.0 g/dL in the first and third trimesters and below 10.5 g/dL in the second trimester. This condition can lead to various adverse outcomes for both mother and child[2].

Prevalence: Globally, around 37% of pregnant women have anemia. In low and middle-income countries, the prevalence can be as high as 56%. In India, anemia affects approximately half of all pregnant women. Impact

of Anemia: Maternal: Increased risk of maternal mortality, postpartum haemorrhage, preterm birth, and low birth weight babies. Fetal/Neonatal:
Increased risk of intrauterine growth retardation, low birth weight, and perinatal death.
Causes of Anaemia in Pregnancy: Iron Deficiency: The most common cause, due to increased iron requirements during pregnancy. Folate and Vitamin B12 Deficiency: Can also contribute to anaemia. Infections: Malaria, hookworm, tuberculosis, and HIV can exacerbate anaemia. Other factors: Socioeconomic status, education level, and geographic location can also influence prevalence. Addressing Anemia: Iron and folic acid supplementation: A key intervention to prevent and treat anemia. Nutritional education and counseling: To promote a balanced diet and address dietary deficiencies[3]. Early detection and management: Regular antenatal checkups and timely treatment are crucial. Addressing underlying causes: Treating infections and other health conditions that contribute to anemia

This study aims to evaluate the prevalence of anemia in pregnant women and assess its relationship with the occurrence of low birth weight in term pregnancies.

METHODOLOGY

This study was conducted in a tertiary hospital. After obtaining institutional ethical committee approval. It was Cross-sectional observational study conducted on 38 patients in the department of Obstetrics & Gynaecology, at a tertiary care centre, from April / 2019 to October/2019
Total 38 participant were approached to project among them No one were excluded in this study and Total 38 Confirmed cases were included on the basis of fulfilling of the eligibility criteria.
The institute Ethics Committee approval was obtained before starting the sample collection. A written and informed consent was taken from the patient regarding the study in his/her vernacular language and English. In this study Patients were subjected to: A detailed history of sign & symptoms and its duration. Detailed history of systemic diseases and its duration, medication were noted. Patients were subjected to General physical examination.

Study Design:

Hospital-based cross-sectional study

Study Population:

38 term pregnant women (gestational age ≥37 weeks) who delivered at a tertiary care hospital

Inclusion Criteria:

- Singleton term pregnancies
- Hemoglobin estimated at or after 28 weeks of gestation
- Delivery at ≥37 weeks

Exclusion Criteria:

- Preterm deliveries
- Chronic illness (renal disease, tuberculosis, hemoglobinopathies)
- Multiple pregnancies

Definitions:

- **Anemia:** Hemoglobin <11 g/dL (WHO criteria)
- **Low birth weight:** <2.5 kg

Flowchart: Study Design and Methodology

Pregnant Women Admitted for Delivery at Term
↓
Screened for Inclusion/Exclusion Criteria
↓

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Haemoglobin Level and Birth Weight Measured
↓
Categorized into Anemic and Non-Anemic
↓
Analysis of Low Birth Weight Association
↓
Statistical Analysis and Interpretation

Statistics and analysis of data

Data is put in excel sheet then mean, median and association is analyzed by SPSS version 20. Chi-square test was used as test of significance for qualitative data. Continuous data was represented as mean and SD. MS Excel and MS word was used to obtain various types of graphs such as bar diagram. P value (Probability that the result is true) of Pvaue <0.05 was considered as statistically significant after assuming all the rules of statistical tests. Statistical software: MS Excel, SPSS version 22 (IBM SPSS Statistics, Somers NY, USA) was used to analyse data. Sample size is calculated by N master statistical software

RESULTS

In this study we found that Anaemia in Pregnancy is associated with demographic profile of patient. 57.9% of Anaemia in Pregnancy is due to Primigravida followed by 42.1 %% Multigravida.

Anaemia in Pregnancy were belong to 18–25 years age group Its prevalence is 42.1%(Table 1)

Age is also associated factors for Anaemia in Pregnancy

63.2% Anaemia in Pregnancy were associated with Rural Residence (Table 1)

Demographic Factors of Study Participants Table 1 (n=38)

Demographic Parameter	Frequency (n)	Percentage (%)
Age 18–25	16	42.1%
Age 26–30	14	36.8%
Age >30	8	21.1%
Primigravida	22	57.9%
Multigravida	16	42.1%
Rural Residence	24	63.2%
Urban Residence	14	36.8%
Booked ANC	26	68.4%
Unbooked ANC	12	31.6%

Anaemia in Pregnancy have many risk factors Poor dietary iron intake

Low socioeconomic status, Teenager pregnancy and Short inter-pregnancy interval

Risk Factors of Anaemia in Pregnancy Table 2 (n=38)

Risk Factor	Number (n)	Percentage (%)
Poor dietary iron intake	22	57.9%
Low socioeconomic status	20	52.6%
Teenage pregnancy	6	15.8%

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Risk Factor	Number (n)	Percentage (%)
Short inter-pregnancy interval	5	13.2%
Poor antenatal care	12	31.6%
Multiparity	16	42.1%

RESULTS

Prevalence of Anemia:

- Anemic (Hb <11 g/dL): 24 (63.2%)
- Non-anemic: 14 (36.8%)

Birth Weight Outcomes:

Group	LBW (<2.5 kg)	Normal Birth Weight (≥2.5 kg)	Total
Anemic (n=24)	14 (58.3%)	10 (41.7%)	24
Non-anemic (n=14)	2 (14.3%)	12 (85.7%)	14

- A statistically significant association ($p < 0.05$) was observed between anemia and low birth weight.

DISCUSSION

This study demonstrates a high prevalence of anemia (63.2%) in term pregnant women, consistent with national data. The findings confirm that anemia is significantly associated with increased risk of delivering low birth weight infants[4].

Anemia compromises oxygen transport to the fetus, impairing intrauterine growth. Most affected women were from low socioeconomic backgrounds with inadequate antenatal care and poor nutritional status. Several risk factors can increase a pregnant woman's susceptibility to anemia. These include dietary deficiencies, particularly in iron and folate, as well as factors like closely spaced pregnancies, multiple pregnancies, and pre-existing health conditions. Morning sickness can also contribute by reducing nutrient intake.

In this study we found that Anaemia in Pregnancy is associated with demographic profile of patient. 57.9% of Anaemia in Pregnancy is due to Primigravida followed by 42.1 %% Multigravida. Anaemia in Pregnancy were belong to 18–25 years age group Its prevalence is 42.1%(Table 1)Age is also associated factors for Anaemia in Pregnancy

63.2% Anaemia in Pregnancy were associated with Rural Residence (Table 1)

Several demographic factors are associated with an increased risk of anemia during pregnancy. These include low socioeconomic status, low levels of education, and older age or parity. Additionally, younger women, those with irregular or no antenatal care, and women experiencing multiple pregnancies (high parity) are also at higher risk[5].

Here's a more detailed look at these factors: Socioeconomic Status: Low income and poverty:

Reduced access to nutritious food, healthcare, and sanitation facilities can lead to nutritional deficiencies, including iron deficiency, which is a major cause of anemia. Poverty and food insecurity Families with limited resources may struggle to afford a balanced diet, increasing the risk of anemia in pregnant women. Unemployment: Unemployment can exacerbate poverty and limit access to resources necessary for a healthy pregnancy[6].

Education Level: Illiteracy and low education: Women with lower levels of education may have limited knowledge about healthy eating habits, the importance of antenatal care, and the risks associated with anemia. Limited access to information: Education empowers women to make informed decisions about their health and seek appropriate medical care. Age and Parity: Younger women: Younger women, particularly adolescents, may

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be more susceptible to anemia due to nutritional demands of their own growth and development coinciding with pregnancy[7,9].

Older women: Women with high parity (having had many pregnancies) may experience iron depletion and nutritional deficiencies, increasing their risk of anemia Spacing of pregnancies: Closely spaced pregnancies may not allow sufficient time for the mother's body to recover and replenish iron stores, leading to anemia. Antenatal Care: Lack of or inadequate antenatal care: Regular antenatal checkups allow for early detection and management of anemia. Delayed or missed appointments: Missing appointments can delay or prevent timely interventions like iron supplementation. Other Factors: Rural residence: Rural areas may have limited access to healthcare facilities and resources, increasing the risk of anemia. Ethnicity: Certain ethnic groups may have higher rates of anemia due to genetic predispositions or cultural practices[10].

Multiple gestation: Carrying twins or triplets can increase the risk of anemia due to increased nutritional demand Dietary Factors: Iron Deficiency: Iron is crucial for hemoglobin production, and a lack of iron-rich foods in the diet can lead to iron deficiency anemia[11]. Folate Deficiency:

Folate (vitamin B9) is essential for red blood cell formation, and inadequate intake can cause folate-deficiency anemia. Vitamin B12 Deficiency: Vitamin B12 is also vital for red blood cell production, and deficiencies can lead to anemia[12].

Pregnancy-Related Factors: Closely Spaced Pregnancies: Having back-to-back pregnancies doesn't allow the body to replenish iron and other nutrients, increasing the risk of anemia. Multiple Pregnancies: Carrying twins or triplets increases the body's demand for iron and other nutrients, making anemia more likely[13].

Morning Sickness: Severe or persistent vomiting can hinder nutrient absorption and increase the risk of anemia. Other Health Conditions: Heavy Menstrual Periods Women with heavy menstrual bleeding before pregnancy may enter pregnancy with lower iron stores, making them more vulnerable to anemia.

Pre-existing Anemia: Women with anemia before pregnancy are at higher risk of developing anemia during pregnancy. Malabsorption Issues: Conditions like celiac disease or Crohn's disease can impair nutrient absorption, increasing the risk of anemia[14]. Certain Medical Conditions: Chronic illnesses like kidney disease or infections can also contribute to anemia[15].

Low Socioeconomic Status: Limited access to nutritious food and healthcare can increase the risk of anemia. Low Education Level: Lack of knowledge about proper nutrition and prenatal care can also play a role Early detection, iron supplementation, and nutritional counseling during pregnancy are essential steps to reduce the burden of anemia and its complications.

CONCLUSION

Anemia is prevalent among pregnant women and is a strong independent risk factor for low birth weight even in term pregnancies. Routine screening and management of anemia should be an integral part of antenatal care to improve maternal and neonatal outcomes

SOURCE OF FUNDING: No

CONFLICT OF INTEREST

The authors report no conflicts of interest

SUBMISSION DECLARATION

This submission has not been published anywhere previously and that it is not simultaneously being considered for any other journal.

REFERENCES

1. Öztürk, M. *et al.* Anemia prevalence at the time of pregnancy detection. *Turk. J. Obstet. Gynecol.* **14**, 176 (2017).
2. Mawani, M., Ali, S. A., Bano, G. & Ali, S. A. Iron deficiency anemia among women of reproductive age, an important public health problem: Situation analysis. *Reprod. Syst. Sex Disord. Curr. Res.* **5**, 1 (2016).

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3. Osungbade, K. O. & Oladunjoye, A. O. Anaemia in developing countries: Burden and prospects of prevention and control. *Anemia* **3**, 116–29 (2012).
4. Bansal, P., Garg, S. & Upadhyay, H. P. Prevalence of low birth weight babies and its association with socio-cultural and maternal risk factors among the institutional deliveries in Bharatpur, Nepal. *Asian J. Med. Sci.* **10**, 77–85 (2019).
5. Rai, R. K. *et al.* The burden of iron-deficiency anaemia among women in India: How have iron and folic acid interventions fared?. *WHO South–East Asia J. Public Health* **7**, 18 (2018).
6. Suryanarayana, R., Santhuram, A. N., Chandrappa, M., Shivajirao, P. & Rangappa, S. S. Prevalence of anemia among pregnant women in rural population of Kolar district. *Int. J. Med. Sci. Public Health* **5**, 454–8 (2016).
7. Toteja, G. *et al.* Prevalence of anemia among pregnant women and adolescent girls in 16 districts of India. *Food Nutr. Bull.* **27**, 311–315 (2006).
8. Molloy, A. M., Kirke, P. N., Brody, L. C., Scott, J. M. & Mills, J. L. Effects of folate and vitamin b12 deficiencies during pregnancy on fetal, infant, and child development. *Food Nutr. Bull.* **29**, S101–S111 (2008).
9. Sehgal, R. *et al.* Prevalence of intestinal parasitic infections among school children and pregnant women in a low socio-economic area, Chandigarh, North India. *RIF* **1**, 100–103 (2010).
10. Desai, G. *et al.* Sickle cell disease and pregnancy outcomes: A study of the community-based hospital in a tribal block of Gujarat, India. *J. Health Popul. Nutr.* **36**, 1–7 (2017).
11. Deshpande, J. D., Phalke, D., Bangal, V., Peeyuusha, D. & Bhatt, S. Maternal risk factors for low-birth-weight neonates: A hospital based case-control study in rural area of western Maharashtra, India. *Natl. J. Commun. Med.* **2**, 394–398 (2011).
12. Roy, S. K., Mait, S., Sinha, N. K. & Manda, K. 2015 Maternal body-mass-index and socioeconomic factors predict gestational duration and birth weight: A cross-sectional study from India. *Cell Biol. Res. Ther.*
13. Noronha, J. A., Bhaduri, A., Bhat, H. V. & Kamath, A. Maternal risk factors and anaemia in pregnancy: A prospective retrospective cohort study. *J. Obstet. Gynaecol.* **30**, 132–136 (2010).
14. Adewara, S., Agba, D. Z., Abdu, M., Oloni, E. & Nwanji, T. Analysing rural–urban disparity in access to safe toilet in Nigeria. *J. Health Med. Nurs.* **48**, 2422 (2018).
15. Supply, W. J. W. & Programme, S. M. *Water for Life: Making it Happen* (World health organization, 2005)

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