



Anaemia and its Effects on Pregnancy

Authors

Dr V. Usha Rani¹, Dr. B. Vijayalaxmi², Dr R. Sarala Devi³

¹Associate Professor, Department of Obstetrics and Gynaecology, Kakatiya Medical College, Warangal, Telangana State Mobile no: 98491 92900

²Associate Professor, Department of Obstetrics and Gynaecology, Government Medical College, Siddipet, Telangana State

³Professor and Head, Department of Obstetrics and Gynaecology, Kakatiya Medical College, Warangal, Telangana State

Corresponding Author

Dr B. Vijayalaxmi

Email: dr.bvlaxmi.gmcs@gmail.com

Abstract

Anaemia is one of the most common nutritional deficiency diseases observed globally. It has been estimated that nutritional anaemia affects almost two-thirds of pregnant women in developing countries. This study was conducted between January 2016 to June 2017 at Government maternity hospital, Hanamkonda, Telangana state after obtaining permission from hospital ethics committee. The aim of this study was to know the prevalence of anaemia and its effects in pregnant women. Pregnant women of all trimesters, aged between 18-36 years were included in this study. The mean height was 150.35 ± 5.36 cm and mean weight 40.8 ± 14.6 kgs. Most of people (46%) of people were belongs 2nd pregnancy, 40% were of 1st and 14% were belongs to 3rd pregnancy. pregnant woman was considered anaemic if haemoglobin was < 11 g/dl. Severity of anaemia was measured as follows: mild if Hb was 9.0–10.9 g/dl; moderate if Hb was 7.0–8.9 g/dl; and severe if Hb was < 7.0 g/dl. Most of patients (62%) were suffering with anaemia. About 33% of patients were anaemic throughout pregnancy. Severe anaemia was observed in 12 patients. Most of pregnant mothers were delivered through caesarean section and normal delivery is noted in only 33% of pregnant people. The mean gestation of the babies born to anaemic mothers was lesser (37 wks) compared to babies born to non-anaemic mothers (39 wks). Babies born to the anaemic mothers remained lighter (2.6 kgs) compared to their counter parts (3.2kgs).

Keywords: Anaemia, Pregnancy, low birth weight, prevalence.

Introduction

Spinal anaesthesia is widely practised all over the world for Global data shows that 56% of pregnant women in low and middle income countries have anaemia^[1]. World Health Organization (WHO) has defined anaemia in pregnancy as the haemoglobin

(Hb) concentration of less than 11 g/dl^[2]. According to WHO, anaemia is considered to be of a public health significance or problem if population studies find the anaemia prevalence of 5.0% or higher. The role of anaemia in pregnancy and iron on the growing foetus has been studied in the last few decades. The outcome of these studies is either

inconclusive or at the most supportive of the popular notions held so far regarding pregnancy outcome and anaemia.^[3-4] Hence, most of the countries have adopted the policy of supplementing pregnant women with iron and folic acid with a View that increasing the Hb levels has some beneficial effect during pregnancy.^[5]

The causes of anaemia during pregnancy in developing countries are multifactorial; these include micronutrient deficiencies of iron, folate, and vitamins A and B12 and anaemia due to parasitic infections such as malaria and hookworm infections like TB and HIV^[6-7]. Contributions of each of the factors that cause anaemia during pregnancy vary due to geographical location, dietary practice, and season.

To determine the prevalence of anaemia and the dietary and socioeconomic factors associated with anaemia in pregnant women living in and around Hanamkonda in Telangana state.

Material and Methods

Global data shows that 56% of pregnant women in low and middle income countries have anaemia^[1]. World Health Organization (WHO) has defined anaemia in pregnancy as the haemoglobin (Hb) concentration of less than 11 g/dl^[2]. According to WHO, anaemia is considered to be of a public health significance or problem if population studies find the anaemia prevalence of 5.0% or higher. The role of anaemia in pregnancy and iron on the growing foetus has been studied in the last few decades. The outcome of these studies is either inconclusive or at the most supportive of the popular notions held so far regarding pregnancy outcome and anaemia.^[3-4] Hence, most of the countries have adopted the policy of supplementing pregnant women with iron and folic acid with a view that increasing the Hb levels has some beneficial effect.^[5]

The causes of anaemia during pregnancy in developing countries are multifactorial; these include micronutrient deficiencies of iron, folate, and vitamins A and B12 and anaemia due to parasitic infections such as malaria and hookworm

infections like TB and HIV^[6-7]. Contributions of each of the factors that cause anaemia during pregnancy vary due to geographical location, dietary practice, and season.

To determine the prevalence of anaemia and the dietary and socioeconomic factors associated with anaemia in pregnant women living in and around Hanamkonda in Telangana state

Results

A total of 200 patients were included in this study. All the demographic data, pregnancy history was shown in table 1. Pregnant people aged between 18 to 36 years were included of mean height of 150.35±5.36 cm and mean weight 40.8±14.6 kgs with mean BMI 25.67 were included in this study. Most of people (46%) of people were belongs 2nd pregnancy, 40% were of 1st and 14% were belongs to 3rd pregnancy.

Table .1: History and demographic data

S.no	Parameter	Number (%)
1	Age	
	18-24	72 (36%)
	24-30	96 (48%)
	30-36	32 (16%)
2	Weight	
	Normal weight	40.8±14.6
	Obesity	55.5±10.6
3	Height	150.35±5.36
4	Gravidia	
	1 st pregnancy	80(40%)
	2 nd pregnancy	92(46%)
	3 rd pregnancy	28 (14%)
5	Inter pregnancy interval	
	1 year	54(27%)
	2 years	66(33%)
6	Iron supplementation	
	Yes	98(49%)
	No	102(51%)

Pregnant woman was considered anaemic if haemoglobin was <11 g/dl. Severity of anaemia was measured as follows: mild if Hb was 9.0–10.9 g/dl; moderate if Hb was 7.0–8.9 g/dl; and severe if Hb was <7.0 g/dl. Most of patients (62%) were suffering with anaemia. More than half of our mothers were anaemic to start with. Higher percentage of anaemia was seen in the second trimester (98%) and was lowest in the third

trimester (34%). About 33% of patients were anaemic throughout pregnancy, 42% patients were normal with 11.2 to 12.4g/dl of haemoglobin. Anaemia was classified as mild, moderate and severe anaemia. Mean Hb levels in all three trimesters were showing the mild anaemia. Severe anaemia was observed in 12 patients with less than 7 g/dl. Almost all anaemic patients were supplemented with iron and folic acid supplements.

Table 2: Haemoglobin levels in pregnant women

Anaemia	Number (%)	Mean Hb
No	76(38%)	11.8
Mild	86(43%)	9.6
Moderate	26(13%)	8.2
Severe	12(6%)	6.4

Table 3: Haemoglobin levels in 3 trimesters

gestation period	Number (%)	Mean Hb
1 st trimester	34	9.32
2 nd trimester	98	9.02
3 rd trimester	68	10.32

Table 4: Pregnancy complication

s.no	Parameter	N0(%)
1	Caesarean sections	172(66%)
2	Pregnancy related complications	42(21%)
3	Preterm delivery	36(18%)
4	Low birth weight	44(22%)
5	Still birth	7(3.5)
6	Early neonatal death	9(4.5)

Discussion

Anaemia has been a very important nutritional disorder in the world. Anaemia during pregnancy is a public health problem especially in developing countries and is associated with adverse outcomes in pregnancy. However, many of these women were already anaemic at the time of conception, with an estimated prevalence of anaemia of almost 50% among non pregnant women in developing countries [8].

The primary cause of anaemia during pregnancy worldwide is iron deficiency secondary to chronic inadequate dietary intake and menstruation, heightened by the physiologic demands of the foetus and maternal blood volume expansion during pregnancy [9]. Genetic causes and poor hygiene that may lead to infections and infestations are other contributing factors [10].

Anaemia during pregnancy is reported to have negative maternal and child health effect and increase the risk of maternal and perinatal mortality [11]. The negative health effects for the mother include fatigue, poor work capacity, impaired immune function, increased risk of cardiac diseases and mortality [12].

According to the Nutrition Impact Model Study's 2011 estimates, the worldwide prevalence of anaemia in pregnant women was 38%, translating into 32 (28 to 36) million pregnant women globally. Because of the persistently high burden of disease, the World Health Organization has long recommended the prenatal use of iron supplements in low and middle income countries, and this is also recommended in many high income countries [12].

In our study 62% people were anaemic. In one of the studies conducted on a large population, it was estimated that 87% of the Indian pregnant women are anaemic. [5] prevalence of anaemia and low BMI among pregnant women from Eastern Maharashtra evaluated and observed that 90% of the women were anaemic [13].

In our study only 1(0.5%) patient was died throughout the study period but some studies have shown that anaemia during pregnancy contributes to 23% of indirect causes of maternal deaths in developing countries [1]. This study shows that low birth weight children in anaemic mothers compared to normal mothers. Some authors have reported an inverse relation between the second trimester Hb and birth weight [14].

In our study anaemic mothers have preterm delivery and low birth weight children. Anaemia in pregnancy is associated with increased risk of preterm birth and low birth weight babies [1,15]. A retrospective study has shown no association between the first trimester anaemia and low birth weight. [16] This could well suggest that third trimester Hb is an important factor in determining birth weight. It is well known that rapid growth of fetus occurs in the third trimester. Iron and other micronutrient accretion rates are the highest in the same trimester as well. This physiology explains the association of third trimester Hb and low birth

weight. In contrast to the above, association of preterm delivery with maternal anaemia is quite striking. Except for the first trimester, anaemia in other trimesters has shown significantly increased incidence of preterm delivery. This association appears strongest in the third trimester. There are many studies showing similar association^[1,5,15,16].

Preterm and low birth weights are still the leading causes of neonatal deaths in developing countries like South Africa contributing to 30% of the deaths. It has also been associated with increased risk of intrauterine deaths low APGAR score at 5 minutes, and intrauterine growth restriction which is a risk for stunting among children of less than two years^[17,18]. High Hb/haematocrit and low birth weight have been documented by some authors. In another study from Nepal, wherein the outcome of 1400 pregnancies was studied retrospectively, no association was found between high haematocrit and either low birth weight or preterm deliveries^[19].

Conclusion

Anaemia in pregnancy was a mild public health problem. More than half of mothers (62%) were suffering with anaemia, however serious problem in the 6% of pregnant women. Anaemia was more frequently seen in second trimester followed by 1st trimester and almost all pregnant women in last trimester were supplemented with iron, folic acids. This anaemia leads to preterm deliveries with low birth weight children.

References

1. R. E. Black, C. G. Victora, S. P. Walker et al., "Maternal and child undernutrition and overweight in low-income and middle-income countries," *The Lancet*, vol. 382, no. 9890, pp. 427–451, 2013.
2. World Health Organization, *Iron deficiency anaemia: assessment, prevention and control: a guide for programme managers*, 2001.
3. Rusia U, Madan N, Agarwal N, Sikka M, Sood SK. Effect of maternal iron deficiency anemia on foetal outcome. *Indian J pathol Microbiol.* 1995;38:273–9.
4. Levy A, Fraser D, Katz M, Sheiner E. Maternal anemia during pregnancy is an independent risk factor for low birthweight and preterm delivery. *Eur J Obstet Gynecol Reprod Biol.* 2005;122:182–6.
5. Kalaivani K. Prevalence and consequences of anemia in pregnancy. *Indian J Med Res.* 2009;130:627–33.
6. S. Brooker, P. J. Hotez, and D. A. P. Bundy, "Hookworm-related anaemia among pregnant women: a systematic review," *PLOS Neglected Tropical Diseases*, vol. 2, no. 9, article e291, 2008.
7. L. H. Allen, "Anemia and iron deficiency: effects on pregnancy outcome," *American Journal of Clinical Nutrition*, vol. 71, no. 5, pp. 1280s–1284s, 2000.
8. World Health Organization. WHO/NUT/MCM/92.2. WHO; Geneva: 1992.
9. The prevalence of anemia in women: A tabulation of available information. Gopalan C. Current food and nutrition situation in south Asian and south-east Asian countries. *Biomed Environ Sci.* 1996; 9:102–16. [PubMed: 8886320]
10. Seshadri S. Prevalence of micronutrient deficiency particularly of iron, zinc and folic acid in pregnant women in South East Asia. *Br J Nutr.* 2001; 85.
11. L. H. Allen, "Anemia and iron deficiency: effects on pregnancy outcome," *American Journal of Clinical Nutrition*, vol. 71, no. 5, pp. 1280s–1284s, 2000.
12. G. A. Stevens, M. M. Finucane, L. M. De-Regil et al., "Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data," *The Lancet Global Health*, vol. 1, no. 1, pp. E16–E25, 2013.

13. Archana Patel,1 Amber Abhijeet Prakash,1 Prabir Kumar Das,1 Swarnim Gupta, Maternal anemia and underweight as determinants of pregnancy outcomes: cohort study in eastern rural Maharashtra, India. *BMJ Open* 2018;8:e021623. doi:10.1136/bmjopen-2018-021623.
14. Rasmussen S, Oian P. First- and second-trimester hemoglobin levels. Relation to birth weight and gestational age. *Acta Obstet Gynecol Scand.* 1993;72:246–51. [PubMed: 8389509]
15. Pena-Rosas JP, Viteri FE. Effects of routine oral iron supplementation with or without folic acid for women during pregnancy. *Cochrane Database Syst Rev.* 2006;(3):CD004736. [PubMed: 16856058].
16. Phaloprakam C, Tangjitgamol S. Impact of high maternal hemoglobin at first antenatal visit on pregnancy outcomes: A Cohort study. *J Perinat Med.* 2008;36:115–9. [PubMed: 18331205].
17. H. L. Kidanto, I. Mogren, G. Lindmark, S. N. Massawe, and L. Nystrom, “Risks for preterm delivery and low birth weight are independently increased by severity of maternal anaemia,” *South African Medical Journal*, vol. 99, no. 2, pp. 98–102, 2009.
18. A. Gebre and A. Mulugeta, “Prevalence of anemia and associated factors among pregnant women in north western zone of tigray, northern ethiopia: A cross-sectional study,” *Journal of Nutrition and Metabolism*, vol. 2015, Article ID 165430, 2015.
19. Bondevik GT, Lie RT, Ulstein M, Kvale G. Maternal hematological status and risk of low birth weight and preterm delivery in Nepal. *Acta Obstet Gynecol Scand.* 2001;80:402–8. [PubMed: 11328215].