www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossrefDOI: https://dx.doi.org/10.18535/jmscr/v6i7.31

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Maternal Hemoglobin Levels during Pregnancy and their relation with Birth Weight of Neonates

Authors
Dr Sandhyarani Maharana[1], Dr Debasish Das[2]
[1]Prof. and Head of the Department, Department of Physiology, Govt. Medical College, Balasore, Odisha
[2]Asst. Prof. Govt. Medical College Baleswer, India

Abstract
Background: *Maternal anaemia is common medical disorder in developing countries. Anaemia in pregnancy results in complications such as low birth weight, preterm birth, increased fetal mortality and morbidity. Also, it has reported to increase the risk of adverse perinatal outcome. The aim of this study was to evaluate the relation between haemoglobin levels in third trimester in pregnant women and the birth weight of baby.*
Methods: *This is a observational study conducted in the department of obstetrics and gynaecology, govt. medical college balasore. Data of 100 pregnant women and newborn which is taken from records are included in the study. All pregnant women with term gestation, singleton pregnancy, with live fetus willing to participate in the study were included.*
Results: *Of 100 women, 65 had anaemia. The prevalence of anaemia was 65% of which 76% had mild anaemia, 24% had moderate anaemia. Mean Hb levels were 10.9gm/dl among non-anaemic mothers and mean birth weight was 2.91 Kg whereas mean hemoglobin level 9.1gm/dl and 2 in anaemic mothers and mean birth weight of baby was 2.38kg.*
Conclusions: *Anaemia in pregnancy is one of the causes of poor perinatal outcome. Hence proper antenatal care and counseling can reduce occurrence of anaemia in pregnancy.*

Introduction

In developing countries majority of pregnant women suffered from anemia.(1) In one of the studies conducted on a large population, it was estimated that 87% of the Indian pregnant women are anemic.(2) It is a well established fact that there is a physiological drop in hemoglobin (Hb) in the mid trimester(2). This physiological drop is attributed to increase of plasma volume and hence decrease of blood viscosity(3) lead to better circulation in placenta(4). In developing country many pathological causes and nutritional deficiency are reason for anemia. Causes include iron deficiency, malaria, helminthic infection.(5) Anemia during pregnancy has been inconsistently associated with an increased risk of preterm delivary and low birth weight (LBW).(6,7) LBW, which includes preterm birth and intra uterine growth restriction(8,9)results in higher risks of mortality and morbidity.

WHO defines anaemia as haemoglobin concentration of ≤11 g/dl. Centre for Disease Control (CDC) defines anaemia as haemoglobin ≤11 mg/dl in first and third trimester and <10 gm/dl in second trimester. However, in developing countries like India, the lower limit is accepted as <10 g/dl, because of prevailing socio economic deprivation.(10,11) WHO reports the

incidence 0f 35-75% in developing countries and 18% in developed countries. Prevalence of anaemia is 43% in women in developing countries and 12% in developed countries. In India, it is 88%. (2bharati)

Our objectives were to assess the association between anemia and LBW.

Method

Study Design

This was an observational study. No specific intervention for the sake of study was done. Hb concentration of mother and the birth weight of baby was obtained from the hospital record during delivery. Record of 100 pregnant women were obtained randomly from the depart. of obstetrics and gynecology at govt. medical college, baleswers. After obtaining informed consent from all the participants they were included in the study. According to the level of hemoglobin. patients were divided into 4 groups; Group 1; Hb > 10.0 gm/100ml (Non anemic group), Group 2; Hb= 8.1-10 gm/100ml (mild anemia) Group 3; Hb=. 5-8 gm/100ml (moderate anemia) Group 4; Hb <5 gm/100ml (severe anemia).

Exclusion Criteria

Pregnant women with one of the following at booking were excluded:

1. Diabetes mellitus.
2. Hypertension (including pregnancy-induced hypertension).
3. Toxoplasmosis, Rubella, Cytomegalovirus, Herpes infection.
4. Diagnosed renal or cardiac illness.
5. Smoker or alcoholic.
6. Hemoglobinopathies (e.g. thalassemia).
7. Multiple gestation.

Statistics

All data analysis was done using SPSS V 16 statistically software package. The data are presented mean ± SD, and statistical analysis is carried out using pearson correlation coefficient

Ethical Committee Approval

The medical college ethical committee had approved this study.

Result

Table 1: Mother's demographic prophile

Mean age group of pregnant mother	22.18 yr
Mean hemoglobin concentration of non anemic mother	10.9gm/dl
Mean hemoglobin level in anemic mother	9.10gm/dl
Mean gestation	38.3 wks

Table 2: Maternal hemoglobin and fetal birth weight

Maternal Hb level	No. of subject	Mean birth weight
≥10 g%	35	2.91kg
8.1 to 10 g%	48	2.38kg
5 to 8 g%	15	
≤ 5 g%	0	

Table 3: correlation between mater Hb concentration and fetal birth weight

	Correlation coefficient	p-value
Maternal hemoglobin concentration ≥ 10gm/dl and fetal birth weight	0.0601	0.61 Not significant
Maternal hemoglobin concentration ‹10gm/dl and fetal birth weight	0.3483	0.002 Significant

Discussion

Anaemia in pregnancy is an important public health concern worldwide. WHO reports the incidence of 35% to 75% in developing countries and 18% in developed countries. Prevalence of anaemia is 43% in women in developing countries and 12% in developed countries. In India, it is 88%.[10,11,12,13]

Prevalence of anaemia in our study is 65%, of which 73% had mild anaemia, 26% had moderate type. The prevalence of anaemia was more in our study compared to study by Shukat et al.[14] where 47% women were anaemic and Tuladhar et al.[15] reported incidence of 41.1% among them 71.4% had mild anaemia, 24.4% had moderate anaemia and 4.2% had severe anaemia. Rana et al.[16] reported prevalence of anaemia of 46.2%, out of which 99.5% had mild anaemia,0.5% moderate anaemia and no case of severe anaemia. The high prevalence of anemia in our study could be due to no adequate diet and iron supplementation.

In this study, mean haemoglobin level was 10.9gm/dl among non- anaemic mothers and mean birth weight was 2.91 kg in this group. Whereas, mean haemoglobin level in anaemic mothers was 9.10gm/dl and mean birth weight was 2.18 in this group (Table 1,2). Similar findings were reported by Rana et al.[10] (mean Hb con was 11.5%, weight - 2.9 kg in non-anaemic and 9.2%, 2.6 kg in anaemic mothers respectively) and Nahum et al.[17] (with mean Hb con of 11.6 g% and mean birth weight of 3.5 kg in non-anaemic group).

When data tested by Pearson correlation between hemoglobin concentration and fetal birth weight nonanemic group showed a significant positive correlation Table 3.

Conclusion

This study showed that low prenatal hemoglobin status is associated with low birth weight in neonates. Anaemia in pregnancy is one of the causes of poor perinatal outcome. Maternal Anaemia is associated with the high risk of low birth weight, overall increases perinatal mortality and morbidity. Hence proper antenatal care and counselling can reduce the occurrence of anaemia in pregnancy.

Reference

1. WHO, 1998 . Global Database on Child Growth and Malnutrition .Geneva: WHO.
2. Kalaivani K. Prevalence and consequences of anemia in pregnancy.Indian J med Res. 2009;130:627–33.
3. Carlin A, Alfirevic Z. Physiological changes of pregnancy and monitoring. Best Practice & Research Clinical Obste-trics & Gynaecology 2008;22(5):801-823.
4. Tan EK, Tan EL. Alterations in physiology and anatomy during pregnancy. Best Practice & Research Clinical Obstetrics & Gynaecology 2013;27(6):791-802
5. van den Broek N , 1998 . Anaemia in pregnancy in developing countries . Br J Obstet Gynaecol 105: 385 – 390 .
6. Klebanoff MA , Shiono PH , Berendes HW , Rhoads GG , 1989 . Facts and artifacts about anemia and preterm delivery . JAMA 262: 511 – 515
7. Berkowitz GS , Papiernik E , 1993 . Epidemiology of preterm birth . Epidemiol Rev 15: 414 – 443 .
8. Xiong X , Buekens P , Alexander S , Demianczuk N , Wollast E , 2000 . Anemia during pregnancy and birth outcome: a meta-analysis . Am J Perinatol 17: 137 – 146 .
9. McCormick MC , 1985 . The contribution of low birth-weight to infant-mortality and childhood morbidity . N Engl J Med 312: 82 – 90 .
10. Stanley FJ , Watson L , 1992 . Trends in perinatal mortality and cerebral palsy in Western Australia, 1967 to 1985 . BMJ 304: 1658 – 1663 .
11. Rana SS, Sharma S, Chand A, Malla R. Relationship between maternal haemog-lobin and fetal weight. NJOG. 2013;8 (1):37-40.
12. WHO. World health statistics quarterly. Geneva: WHO; 1980: 197-224.
13. UNICEF. Reduction of low birth weight, a South Asia priority. Kathmandu: UNICEF Rosa; 2002.
14. Francis S, Nayak S. Maternal haemoglobin level and its association with pregnancy outcome among mothers. NUJHS. 2013;3(3):96-110.
15. Shaukat M, Zaheen A, Zaanam Q, Sheikh GA. Maternal anaemia, perinatal morbidity and mortality. J Pak Paed Assoc. 2002;80:88-98.
16. Tuladhar H. Anaemia in adolescent pregnancy. JNMC. 2000;2(1):19-21.
17. Nahum GG, Stanislaw H. High altitude exposure during pregnancy and low birth weight. J Rep Med. 2004;49(4):297-305.