

# A study of correlation between maternal hemoglobin and birth weight of new born

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## Abstract

**Introduction:** Anemia is the commonest medical disorder in pregnancy. It is especially more common in developing countries because of poor nutritional and high prevalence of parasitic infestation **Aims and Objectives:** To Study correlation between maternal hemoglobin and birth weight of new born. **Methodology:** This was a cross-sectional study conducted in Vinayaka Missions Kirupananda Variyar Medical College And Hospital, Seeragapadi, Salem from June 2012 to June 2013. All antenatal cases getting admitted for delivery at Vinayaka Missions Kirupananda Variyar Medical College And Hospital were included into the study. The statistical analysis was done by the chi-square test analyzed by SPSS 19 version software. **Result:** In our study we have seen that the majority of the new born to mothers with mild anemia were with birth weight >2500 i.e. 19(90.48%) followed by 2251-2000 -1 (4.76%), 2000-2250 were 1 (4.76%), < 2000 were 0(0%). The majority of the patients with moderate anaemia the new born were with birth weight>2500 were 55(59.14%), 2251-2500 were 16(17.2%), 2001-2250 were 18 (19.35%), <2000 Were 4 (4.3%). The majority of the new born to mothers with severe anemia with birth weight <2000 were 4 (57.14%), 2001-2250 were 2(28.57%), 2251- 2500 were 1 (14.29%), >2500 were 0 (0%). As the grade of severity of anemia increases the birth weight in new born decreases this observed difference is statistically significant ( $\chi^2 = 40.89, df=6, p<0.0001^{***}$ ) **Conclusion:** It can be concluded from our study that as the severity of Anemia in pregnant women increases the birth weight in new born significantly decreases.

**Key Words:** Maternal hemoglobin, birth weight of new born, IUGR.

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## INTRODUCTION

Anemia is the commonest medical disorder in pregnancy. It is especially more common in developing countries because of poor nutritional and high prevalence of parasitic infestation<sup>1, 2</sup>. Prevalence of anemia among pregnant women in developing countries averages 56%

with a range of 35% to 100% among various regions of the world<sup>3</sup>. Anemia in pregnancy is considered one of the major risk factors contributing to maternal health in developing countries<sup>4</sup>. An association of anemia with adverse maternal outcome such as puerperal sepsis, antepartum hemorrhage, post partum hemorrhage and maternal mortality is no longer a debatable issue<sup>5, 6, 7</sup>. Anemia during pregnancy may also contribute to perinatal morbidity and mortality by increasing the likelihood of intrauterine growth retardation and preterm delivery. Severe anemia significantly increases the risk of neonatal complication<sup>8</sup>. The more severe the anemia the greater the risk that the mother will deliver a low birth weight baby due to intra uterine growth retardation<sup>9,10</sup>. Anemia is directly related to risk of preterm delivery, inadequate gestational weight gain and increased perinatal mortality<sup>11</sup>. There is an adverse relationship between mother's anemic condition and birth outcomes. Anemia among women results in high risk of premature

delivery, low birth weight babies and also one of the causes of termination and abortion<sup>12</sup>

### MATERIAL AND METHODS

This was a cross-sectional study conducted in Vinayaka Missions Kirupananda Variyar Medical College And Hospital, Seeragapadi, Salem from June 2012 to June 2013. All antenatal cases getting admitted for delivery at Vinayaka Missions Kirupananda Variyar Medical College And Hospital were included into the study while Women who received blood transfusion during antenatal period, Women receiving immunosuppressive therapy, Women on drugs causing bone marrow suppression were excluded from the study. Exclusion criteria were based on information from the patients or attenders with review of antenatal record and previous medical records. About 150 antenatal mothers who attended obstetrics department for delivery were included in the study after obtaining informed consent from the mothers. Selection of mothers was by Simple Random Sampling Procedure (Lottery method). Relevant history was taken in all mothers. Only third trimester hemoglobin was recorded. Data regarding maternal hemoglobin was collected from antenatal records. Birth weight was measured using electronic weighing machine. Machine was balanced to zero position each time before taking measurement. Babies were weighed naked at '0' hour of life using electronic weighing machine. Weighing machine was checked periodically by known standard weights. The statistical analysis was done by the chi-square test analyzed by SPSS 19 version software.

### RESULT

**Table 1:** Distribution of the patients as per the birth weight in mild anaemia

Birth weight	No. (%)
< 2000	0(0%)
2001-2250	1(4.76%)
2251- 2500	1(4.76%)
>2500	19(90.48%)

The majority of the new born were with birth weight >2500 i.e. 19(90.48%) followed by 2251- 2500 - 1(4.76%), 2001-2250 were 1(4.76%), < 2000 were 0(0%).

**Table 2:** Distribution of the patients as per the birth weight in moderate anaemia

Birth weight	No. (%)
<2000	4(4.3%)
2001-2250	18(19.35%)
2251- 2500	16(17.2%)
>2500	55(59.14%)

The majority of the patients with moderate anaemia the new born were with birth weight >2500 were 55 (59.14%), 2001-2250 were 18 (19.35%), 2251- 2500 were 16 (17.2%), <2000 Were 4 (4.3%).

**Table 3:** Distribution of the patients as per the birth weight in severe anaemia

<2000	4(57.14%)
2001-2250	2(28.57%)
2251- 2500	1(14.29%)
>2500	0(0%)

The majority of the new born to mothers with severe anemia with birth weight <2000 were 4 (57.14%), 2001-2250 were 2 (28.57%), 2251- 2500 were 1 (14.29%), >2500 were 0 (0%).

**Table 4:** Distribution of the patients as per the correlation of Grade of Anemia and Birth weight of new born

Birth weight	Mild anaemia No. (%)	Moderate anaemia No. (%)	Severe anaemia No. (%)
< 2000	0(0%)	4(4.3%)	4(57.14%)
2001-2250	1(4.76%)	18(19.35%)	2(28.57%)
2251- 2500	1(4.76%)	16(17.2%)	1(14.29%)
>2500	19(90.48%)	55(59.14%)	0(0%)

( $\chi^2 = 40.89, df=6, p<0.0001***$ )

From above table it is clear that as the grade of severity of anemia increases the birth weight in newborn decreases this observed difference is statistically significant ( $\chi^2 = 40.89, df=6, p<0.0001***$ )

### DISCUSSION

Anemia is a major health problem that affects 50% of the pregnant women worldwide<sup>12</sup>. According to the World Health Organization (WHO)<sup>13</sup>, the diagnosis of anemia in pregnant women is established when the concentration of Hb is below 11 g/dl, this being the borderline between "physiologic anemia during pregnancy" and true anemia during pregnancy. Anemia during pregnancy is associated with high rates of maternal and perinatal mortality, low birth weight, premature delivery, and other adverse birth outcomes<sup>14</sup>. The association between maternal Hb levels during pregnancy and adverse outcomes is controversial. In our study we have seen that the majority of the new born to mothers with mild anemia were with birth weight >2500 i.e. 19(90.48%) followed by 2251- 2500 - 1 (4.76%), 2000-2250 were 1 (4.76%), < 2000 were 0 (0%). The majority of the patients with moderate anaemia the new born were with birth weight >2500 were 55 (59.14%), 2001-2250 were 18 (19.35%), 2251- 2500 were 16 (17.2%), <2000 Were 4 (4.3%). The majority of the new born to mothers with severe anemia with birth weight <2000 were 4 (57.14%), 2001-2250 were 2 (28.57%), 2251- 2500 were 1 (14.29%), >2500 were 0(0%). As the grade of severity of anemia increases the birth weight in newborn decreases this observed difference is statistically significant ( $\chi^2 = 40.89, df=6, p<0.0001***$ ) These results are in accordance with Several studies ; they have reported that severe anemia in

early pregnancy is associated with adverse outcomes, such as low birth weight (LBW)<sup>16,17</sup>, although others have revealed no such association<sup>18,19</sup>. A study by Yi *et al.*, showed that anemia before pregnancy was associated with an elevated risk of preterm delivery<sup>20</sup>. Kozuki *et al* found that moderate to severe maternal anemia have a link with intra-uterine growth retardation<sup>21</sup>.

## CONCLUSION

It can be concluded from our study that as the severity of Anemia in pregnant women increases the birth weight in new born significantly decreases.

## REFERENCES

1. Guidotti R.J. Anaemia in pregnancy in developing countries. *Br.J.Obstet.Gynaecol.* 2000; 107:437-38.
2. Vanden Broek N. Anaemia in sub Saharan countries. *Eur J ObstetGynaecolReprod Biol.* 2001;96:4-6
3. World Health Organisation. The prevalence of anaemia in women: A tabulation of available information, 2<sup>nd</sup> Ed, Geneva WHO, 1992.
4. AbouZahr C, Royston E. Maternal mortality. A Global factbook World Health Organisation, Geneva, 1991
5. Roy S, Chakrawarthy P S, Maternal and Perinatal outcome in severe anaemia. *J.Obstet Gynae Ind* 1992; 42:743-50.
6. Bondevik G T, Ulstein M, Lie, lie R T, Rana G, K Vale G. The prevalence of anaemia in pregnant Nepali women – A study in Kathamandu, *Acta ObstetGynaecolScand* 2000; 79(5):341-9.
7. Ulstein M, Rana G, Yangzom K, Gurung R, Karki A, Gurung G *et al.* Some fetal and pregnancy parameters in Nepal. *ActaObstetGynaecolScand* 1998; 67:47-52.
8. Ram Hari Ghimire and Sita Ghimire. Maternal and fetal outcome following severe anaemia in pregnancy –journal of nobel medical college, 2013:Vol 2, No. 1, Issue 3. 22-26
9. Scholl, T.O, Hediger, M.L, Fischer, R.L and Shearer, J.W (1992). Anaemia vs Iron deficiency: increased of preterm delivery in a prospective study. *Am.J.Clin.Nutr.* 55:985-988 16. Rajaratnam. A, R. X. Jolly, V. Sampathkumar (1999) Anaemia in pregnancy : impact of iron, deworming and IEC. RUHSA department. mother care project
10. Murphy, J.F, O'Riordan, J., NewCombe, R.G., Coles, E.C and Pearson, J.F (1986). Relation of haemoglobin levels in first and second trimesters to outcome of pregnancy. *Lancet* 1:992-995
11. Mousumi Gogoi, Ranjan Kumar Prusty – maternal anaemia, pregnancy complications and birth outcome: Evidence from north East India. *Journal Of North East India Studies.* Vol3, No.1, Jan-Jun 2013:74-85.
12. Ahankari A, Leonardi-Bee J. Maternal hemoglobin and birth weight: systematic review and meta-analysis. *Int J Med Sci Public Health.* 2015; 4(4): 435-445
13. World Health Organization. Nutritional Anemias: report of a WHO Scientific Group. Geneva, Switzerland: 1968, Tech Rep Series 405
14. Sukrat B, Wilasrusmee C, Siribumrungwong B, *et al.* Hemoglobin concentration and pregnancy outcomes: a systematic review and meta-analysis. *BioMed research international* Volume 2013, Article ID 769057, 9 pages.
15. Hamalainen H, Hakkarainen K, Heinonen S. Anaemia in the first but not in the second or third trimester is a risk factor for low birth weight. *Clin Nutr* 2003; 22(3): 271–275.
16. Scanlon KS, Yip R, Schieve LA, Cogswell ME. High and low hemoglobin levels during pregnancy: differential risks for preterm birth and small for gestational age. *ObstetGynecol* 2000; 96(5 Pt 1):741–748.
17. Bakacak M, Avci F, Ercan O, Kostu B., *et al.* The effect of maternal hemoglobin concentration on fetal birth weight according to trimesters. *J MaternFetal Neonatal Med* 2014; 1–5.
18. Mathews F, Youngman L, Neil A. Maternal circulating nutrient concentrations in pregnancy: implications for birth and placental weights of term infants. *Am J Clin Nutr* 2004; 79(1):103–110.
19. Abeysena C, Jayawardana P, de Seneviratne AR. Maternal haemoglobin level at booking visit and its effect on adverse pregnancy outcome. *Aust N Z J ObstetGynaecol* 2010; 50(5):423–427.
20. Yi S, Han Y, Ohrr H. Anemia before pregnancy and risk of preterm birth, low birth weight and small-for-gestational-age birth in Korean women. *European journal of clinical nutrition* 2013; 67(4):337-342.
21. Kozuki N, Lee AC, Katz J. Moderate to severe, but not mild, maternal anemia is associated with increased risk of smallfor-gestational- age outcomes. *The Journal of nutrition* 2012; 142(2): 358-362

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