



STUDY OF EFFECT OF MATERNAL HAEMOGLOBIN AT TERM WITH BIRTH WEIGHT AND APGAR SCORE- A CROSS SECTIONAL OBSERVATIONAL STUDY

Obstetrics & Gynaecology

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KEYWORDS

INTRODUCTION

Maternal Anaemia is one of the leading causes of maternal and neonatal morbidity worldwide. Maternal Anaemia is associated with poor intrauterine growth and increased risk of preterm births and low birth weight rates¹. Low birth weight inevitably leads to poor growth trajectory in infancy, childhood and adolescence². Among many causes of anaemia in women, iron deficiency is the most common cause, primarily due to menstrual loss and iron deficient diet. Maternal nutrition critically determines fetal nutrition and has a significant contribution to fetal and neonatal health. Maternal intakes of micronutrients such as folic acid and iron are crucial for fetal growth and development. Prevalence of Anaemia (2019-2021) is found to be 52.2%³.

Globally, about 18 million infants are born with Low birth weight of <2500g every year. Of these 40% are attributed to neonatal deaths⁴. This study aims to find a correlation between maternal haemoglobin at term with birth weight and APGAR score.

MATERIALS AND METHODS

This study was conducted in OBG department at Akash institute of medical sciences and research centre, on 200 postpartum mothers in postnatal ward. It was carried out from October 2024 to February 2025. Maternal haemoglobin at term, birth weight of baby, APGAR score at 1 minute and 5 minutes and placental weight was noted down. Following data was analyzed using SPSS version 25.

INCLUSION CRITERIA

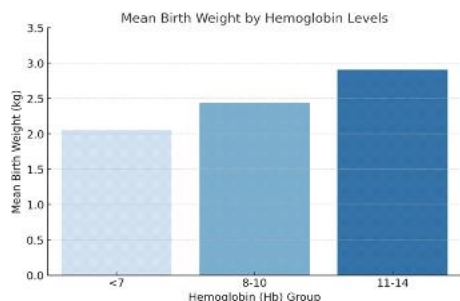
All term babies (>37 weeks) and babies born to women of age 21 - 35 were included

EXCLUSION CRITERIA

Babies born to women having Gestational diabetes mellitus, pregnancy induced hypertension, fever with rash, babies with congenital anomalies, neonates with RDS, TTNB, MAS. All babies were examined by investigator to assess full systemic information and birth weight was recorded. SPSS version 25 was used for statistical analysis.

RESULTS

This study included 200 postpartum mothers. Maternal Haemoglobin at term, birth weight, APGAR score was analyzed. Majority of cases (77.39%) have Hb more than 11g/dl. 22.6% of cases fall in the 8-11g/dl range. <10% of cases fall under 7g/dl.



Hb (g%)	Frequency	percentage (%)	Average Hb
>11	154	77.3	12.21
8-11	45	22.6	10.0
7-8	1	1.2	7.0

Hb(g%)	count	Mean birth weight (kgs)	Standard Deviation
7-8	1	2.05	0.07
8-11	45	2.44	0.44
>11	154	2.91	0.45

Mean birth weight was 2.05kgs for (Hb<7g/dl), 2.44kgs for group of mothers with Hb 8-10g/dl and 2.91 kgs for group of mothers with Hb 11-14g/dl. This study shows there is a direct relationship between Haemoglobin at term and birth weight of the baby.

Hb Range	count	Average APGAR
7-8	1	6
8-11	45	7.44
>11	154	7.9

The above table denotes that higher Haemoglobin levels were associated with better APGAR scores and lower haemoglobin levels were associated with lower APGAR scores indicating better perinatal outcome in groups with higher Haemoglobin levels.

Hb range	frequency	percentage (%)	average placental weight(g)
7-8	1	0.50	500
8-11	45	22.61	498
>11	154	76.88	488

In our study there is no correlation found between haemoglobin and placental weight. Reason may be due to less number of subjects studied and pregnant women with <7g haemoglobin only 1, might have contributed to no correlation.

Chi square test was performed between the 3 groups of haemoglobin 7-8, 8-11, >11g/dl with birth weight of 3 groups 2-2.5, 2.5-3.0 and >3kgs. Chi square value 22.80 and p-value 0.00014. Since p-value (<0.05). This suggests a statistically significant association between haemoglobin levels at term and birth weight and APGAR score of the baby.

DISCUSSION -

Maternal haemoglobin during pregnancy plays a crucial role in fetal development. In my study, we analyzed 200 postpartum mothers. Majority of cases (77.39%) have Hb more than 11g/dl. 22.6% of cases fall in the 8-11g/dl range. <10% of cases fall under <7g/dl. Mean birth weight was 2.05kgs for (Hb<7g/dl), 2.44kgs for group of mothers with Hb 8-10g/dl and 2.91 kgs for group of mothers with Hb 11-14g/dl. Statistical analysis was done using Chi Square test, p value 0.00014 which is statistically significant. In 2009 Kalaivani et al, did review of literature and found a strong association between maternal Anaemia and low birth weight which correlates with our study⁴. In 2011 Sekhvat et al conducted a cross sectional study on 1842 patients. Prevalence of Anaemia was 17.8% and associated with increased risk of low birth weight, which correlates with our study⁵. In 2022 Sah et al conducted a cross sectional study on 2418 term pregnant women. Multivariate logistic analysis that mothers who had low haemoglobin had higher odds of having low birth weight babies, which also correlates with our study⁶.

In our study higher Haemoglobin levels were associated with better APGAR scores and lower Haemoglobin levels were associated with poor APGAR scores at birth. In 2011 Sekhvat et al conducted a cross sectional study on 1842 patients and concluded Anaemia (Hb < 10g/dl) was associated with a significantly increased risk of lower APGAR scores at birth, which is consistent with our study⁷.

In our study there is no correlation found between haemoglobin and placental weight. Naomi Mitsuda et al (2020) evaluated 83354

singletons in a nationwide cohort at Japan. placental weight was significantly higher in women with moderate or severe Anaemia showing compensatory placental hypertrophy⁸. In our study there is no significant correlation due to less number of subjects.

CONCLUSION

Our study concluded that there is a direct relationship between maternal Haemoglobin at term and birth weight which is statistically significant as confirmed by chi square test. Maternal Anaemia is directly proportional to fetal growth. Vigilant screening during antenatal period and timely intervention can massively reduce the incidence of Anaemia in pregnancy, thereby reducing the incidence of low birth weight and adverse perinatal outcome.

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