



# Correlation of Maternal Hemoglobin Concentration with Birth Weight

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## Abstract

We did a pilot study to determine the correlation of maternal Hemoglobin concentration at labor with birth weight in Qazi Hussain Ahmed Medical Complex Nowshera. We recruited cases from labor room irrespective of age and gender, while the exclusion criteria were all candidates taking oral or IV iron therapy. Birth weight of babies was recorded from chart of patients. Independent t- test was used to see the difference in birth weight of anemic and non-anemic mothers. We observed a statistically significant difference in the concentrations of hemoglobin of the mothers with birth weight of new born babies (P=0.001).

**Keywords:** Maternal Anemia; Birth Weight; Iron Deficiency Anemia

## Background

Maternal anemia as defined by World Health Organization (WHO) [1] is significantly associated with Low birth weight. Sekhvat L reported that Maternal Anemia (Hb < 10 g/dl) is associated with statistically significant increased risk of low birth weight (< 2500 g) [2]. Researchers further investigated the relationship between maternal hemoglobin in the third trimester of pregnancy and maternal outcome in the form of birth weight. It was noted that low hemoglobin the third trimester is statistically significantly associated with low birth weight<sup>3</sup>. Hence we tried the same in our population to see the correlation of maternal iron deficiency anemia with birth weight of the new born.

## Methodology

This was a pilot cross sectional study was conducted in the Pathology department in collaboration of department of Gynecology and obstetrics, Qazi Hussain Ahmed Medical Complex, Medical Teaching Institution Nowshera, from 1st Jan 2019 to 21st May 2019. Here we present the association of

hemoglobin levels with birth weight. We recorded data from the labor room of the Qazi Hussain Ahmed Medical Complex Nowshera. Out of total, 67 babies had birth weight <2.5kg (Category 1) and 69 had birth weight >2.51kg (Category 2) and the same time the hemoglobin concentration of the mother at time of delivery was recorded from the chart data of the patient.

We categorized the birth weight data into two groups, low birth weight <2.5kg and normal >2.51kg. Similarly we divided patients into two categories on the basis of Hemoglobin concentration (Category 1, Hb < 11g/dl), (Category 2, Hb > 11.1g/dl) as per World Health Organization Guidelines [3]. We used independent T test to show the difference in birth weight of babies of anemic and non-anemic mother.

## Findings and Discussion

It was noted that there was a statistically significant difference in the concentrations of maternal hemoglobin with birth weight of newborn babies (p-value 0.001). Tables 1 & 2.

Pregnancy is most often associated with exhaustion of iron store and if not given iron therapy can result in morbid

outcome in the form of iron deficient babies [4,5].

Group Statistics					
	LBWCAT	N	Mean	Std. Deviation	Std. Error Mean
Hb%	1.00<2.5kg	67	10.3836	1.7457	0.21327
	2.00>2.51kg	69	12.0899	1.34985	0.1625

**Table 1:** Group Statistics.

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hb%	Equal variances assumed	4.21	.042	-6.38	134	.001	-1.706	.267	-2.234	-1.177
	Equal variances not assumed			-6.36	124	.001	-1.706	.268	-2.236	-1.175

**Table 2:** Independent Samples Test.

We tried to use risk estimate analysis on low birth weight with hemoglobin categories, it was noted that the risk of low birth weight in for cohort Hb category = 1.00<11g/dl was 2.2. While this risk was negligible for the cohort Hb category = 2.00>11g/dl to 0.43.

### Conclusion and Recommendations

Therefore it must be taken in consideration that making hemoglobin concentration above 11g/dl at delivery has an uphill positive impact on the birth weight of the babies. There is need for multidisciplinary approach to work for antenatal health care to have healthy outcome in term of healthy generation. Hence it is recommended that patients with Hb% less than 11g/dl must be screened, followed and remedial action may be taken well in time to combat iron deficiency in pregnancy specially in third trimester to avoid the fetal thirst for iron and to avoid neonatal morbidities and mortalities associated with IDA.

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