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## A co-relational study to measure the placental weight and birth weight among non-anemic and anemic pregnant women

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### Abstract

Pregnancy is a unique interesting and frequently joyous time in female life because it highlights the mother's remarkable, innovative, and nurturing powers even as offspring a bridge to the future. It is the time during which one or more babies develop inside a woman's womb. Anemia is a relatively common condition during pregnancy that carries several health hazards for both the mother and the unborn child. Anemia mainly effects on placental weight and birth weight.

**Method:** A descriptive design was used in the study. A total of 60 pregnant women (30 non anemic and 30 anemic) were selected through the convenience sampling technique. A self-structured tool was used to collect the data.

**Result:** The comparison of placental weight among non-anemic and anemic pregnant women. The data displays that mean $\pm$  SD 514.00 $\pm$ 14.28 of non-anemic placental weight and 557.00 $\pm$ 12.90 of anemic placental weight. The t value is 12.23 at  $p < 0.05$ . That was significant. The comparison of birth weight among non-anemic and anemic pregnant women. The data displays mean $\pm$  SD 3.13 $\pm$ 0.34 of non-anemic birth weight and 2.07 $\pm$ 0.18 of anemic birth weight. The mean difference is 1.05. The t value is 14.758, at  $p < 0.05$ , and was significant. The Correlation between placental weight and birth weight among non-anemic and anemic pregnant women which was calculated using the Pearson correlation coefficient. The results show that there was a negative correlation between placental weight and birth weight ( $r = -0.105$ ) in non-anemic pregnant women and a positive correlation between placental weight and birth weight (0.027) which was non-significant. The association was found in the Duration of marriage between placental weight and monthly income of birth weight with selected demographical variables at  $p < 0.05$ .

**Conclusion:** According to the findings, anemia during pregnancy is a dangerous condition that harms both placental weight and birth weight. This study found that placental weight was increased and birth weight was decreased in anemic women.

**Keywords:** Placental weight, birth weight, non-anemic, anemic, pregnant women

### Introduction

Anemia causes changes in the functioning of the brain which causes the malfunctioning of neurotransmitters. Therefore, infants and young children with iron deficiency anemia are at risk for developmental disorders related to cognitive, social, emotional, and adaptive function. Previous studies have delays in both shown delays in motor development [1]. According to the World Health Organization (WHO), a survey estimates that 55.9% of pregnant women worldwide have anemia. Anemia is prevalent in India, according to the National Health Survey of Families, which relies on data from 2015–16 and explicitly notes increases in anemia for pregnant women. In 2016, 50.4% of pregnant women were reported to be anemic. In developing nations, anemia during pregnancy is more common. Around 56% of people in South East Asia have anemia. Anemia in pregnancy is a common occurrence in India, where it ranges from 40 to 80% [2].

Anemia during pregnancy has a significant impact on the placenta. The placenta, also known as "the life of the fetus in utero," performs a variety of activities to support the fetus' development and communicates with both the mother and the growing fetus. The most significant and trustworthy source of details regarding the baby's prenatal experiences [3]. The placenta has an important role in intrauterine life.

The impaired placental function was a major cause of fetal growth restriction. The small placenta might restrict intrauterine fetal development and reduce placenta efficiency just before delivery [3, 4]. Birth weight is one of the most attainable and misinterpreted variables in epidemiology. A baby's weight during birth firmly corresponds with fatality risk in the initial year and barely with progression trouble in childhood and the threat of different diseases in adulthood. Epidemiological findings show that children under 2, 500 gm are around 20 times more likely to die as compared to heavier infants. Moreover, 20 million babies are born underweight each year accounting for 15.5% of all births and 16.5% in developing countries. Several research studies have been conducted to determine the causes of low birth weight, and the results show that the causes can be categorized into a variety of social, biological, psychological, and nutrition-related aspects [5, 6]. Balanced fetal and placental growth is important for fetal development; maternal environmental disturbances can alter this balance, increasing the risk of cardiovascular disease, immunological disease, and metabolic syndrome in adulthood [7].

### Need of study

Pregnancy is a life event that requires major physiological and psychological changes for the mother. Many adaptations occur throughout each trimester, the main purpose is to promote fetal growth. Pregnancy is a sensitive period in a woman's life. Pregnant women must avoid risk factors that can affect their health and the growth and development of their children [8]. A placenta is a physiological link between the mother and her fetus. Life-sustaining oxygen is one of the nutrients that are given from mother to fetus through the placenta. Additionally, the mother receives fetal waste for elimination. Since pregnant women and fetuses come into contact with each other here, maternal or fetal illnesses may have placental consequences. On the other hand, primary placental anomalies can harm the health of the mother and the fetus. Therefore, a placenta examination may reveal information on the fetus' response to maternal illnesses or the reason for premature delivery, fetal growth restriction, or neurodevelopmental disability. In cases of fetal or neonatal death, the placental investigation is a crucial and even clinically significant part of the autopsy [9].

Using the placental ratio as a marker, infants with possible in-utero growth disturbance can be identified, so that their postnatal growth and future health status can be monitored. Thus, there may be the effect of maternal anemic condition on placental growth in turn may affect the newborn growth and development. Therefore, there was a need to assess the effect of maternal anemic condition on the placenta through

placental examination. And further correlate the changes in placental weight with the birth weight of the baby. So the investigator felt that there was a need to find out whether maternal anemia has some effect on placental volume and neonatal outcomes.

### Aim of the study

The aim of the study is to measure the placental weight and birth weight among non-anemic and anemic pregnant women at SGRD, Hospital, Vallah, Amritsar.

### Objectives of study

To measure and compare the placental weight and birth weight among non-anemic and anemic pregnant women  
To find out correlation between placental weight and birth weight among non-anemic and anemic pregnant women  
To find out association between placental weight and birth weight with selected Socio-demographically variables in both groups

### Research Methodology

A Descriptive research design was utilized to achieve the aim of the study. The research setting is the physical location where data collection takes place. The present research was carried out in the labor room and gynae OT of Sri Guru Ram Das Hospital, Amritsar, Punjab. The target population was the entire aggregate of cases that meet the designed set of criteria. The population comprised pregnant mothers who were undergoing delivery at SGRD hospital, Vallah, Amritsar. The Sample size was 60 pregnant women (Non-anemic pregnant women n=30) and women (anemic pregnant women n=30). Non-probability Convenience Sampling Technique was used to select the sample.

### Part A- Socio-demographic profile

It consists of items for obtaining information from pregnant women:

i.e., Age, educational status, occupational status, monthly family income, type of family, habitat, lifestyle, duration of marriage, awareness about anemia, and dietary history.

### Part B- Clinical profile

It consists of items for obtaining information from pregnant women i.e., Gravida, Parity, antenatal visit, iron and folic acid supplements, Period of gestation, hemoglobin, and weight gain during pregnancy.

### Part C- Obstetrical profile

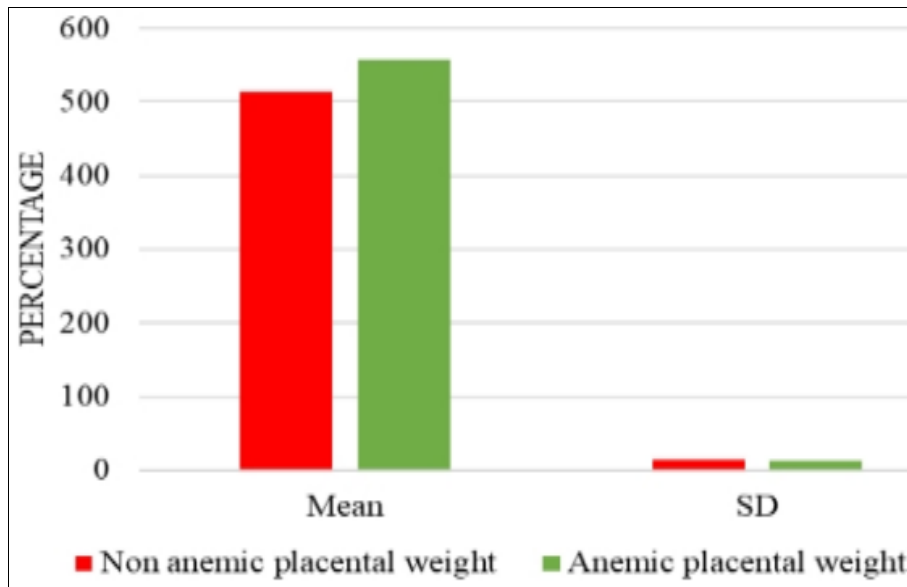
It consists of items for obtaining information from pregnant women: i.e. Placental weight and Birth weight

### Results

**Table 1 a):** Comparison of Placental weight among non-anemic and anemic pregnant women N=60

Comparison	Mean± SD	Mean D	t value	DF	p-value
Non-anemic placental weight	514.00±14.28	43.00	12.23	58	0.01*
Anemic placental weight	557.00±12.90				

\*Significance NS: Non significance

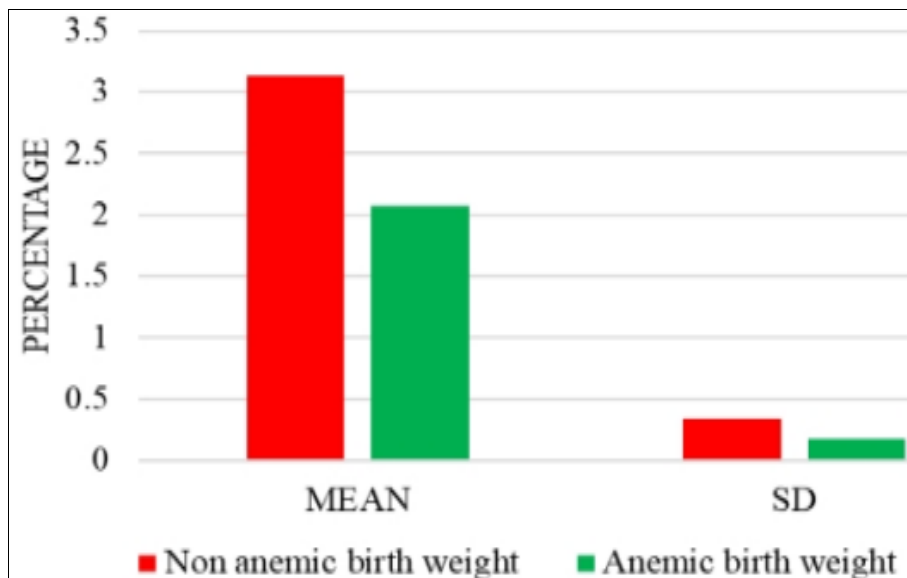


**Fig 1:** Distribution of comparison of placental weight among non-anemic and anemic pregnant women

**Table 2 b):** Comparison of Birth weight among non-anemic and anemic pregnant women N=60

Comparison	Mean± SD	Mean D	t value	DF	p-value
Non-anemic birth weight	3.13±0.34	1.05	14.758	58	0.01*
Anemic birth weight	2.07±0.18				

\*Significance NS: Non significance

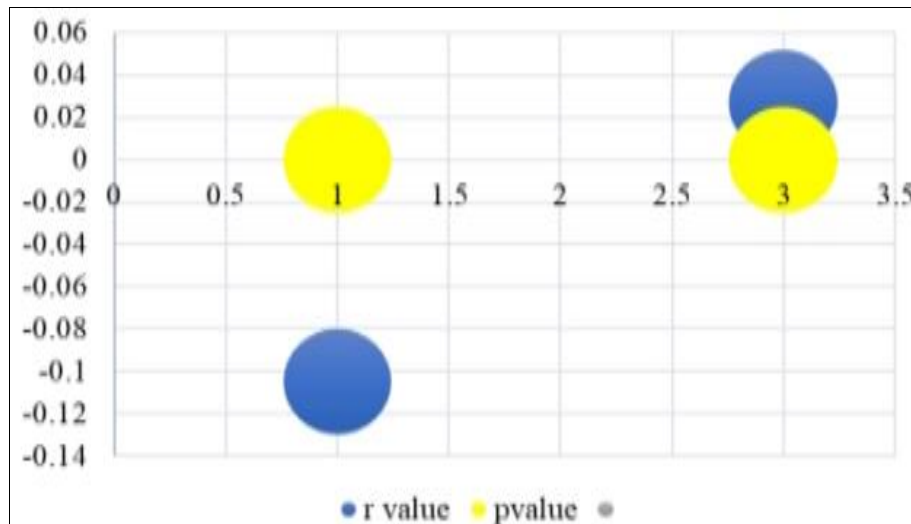


**Fig 2:** Distribution of Comparison of Birth weight among non-anemic and anemic pregnant women

**Table 3:** Correlation between Placental weight and Birth weight among non-anemic and anemic pregnant women N=60

Correlation	Variables	r value	p-value
Non-anemic	Placental weight and birth weight	-0.105	0.58 <sup>NS</sup>
Anemic	Placental weight and birth weight	0.027	0.88 <sup>NS</sup>

\*Significance NS: Non significance



**Fig 3:** Distribution of Correlation between Placental weight and Birth weight among non-anemic and anemic pregnant women

### Discussion

The first objective was to measure and compare the placental weight and birth weight among non-anemic and anemic pregnant women. To compare the placental weight: the mean  $\pm$  SD was 514.00 $\pm$ 14.28 in the non-anemic group and 557.00 $\pm$ 12.90 in the anemic group, revealing that the mean difference was 43.00 and 't' value 12.23 at  $p < 0.05$  level. This indicates that there was a significant difference between non-anemic and anemic groups. Similarly, for birth weight: The mean  $\pm$  SD was 3.13 $\pm$ 0.34 in the non-anemic group and 2.07 $\pm$ 0.18 in the anemic group, revealing that the mean difference was 1.05 and 't' value 14.758 at  $p < 0.05$  level. This indicates that there was a significant difference between non-anemic and anemic groups. The study supported by Khatun *et al.* [23] conducted a comparative cross-sectional study to assess the ratio of placenta to birth weight in anemic and non-anemic mothers. The study was conducted on 82 anemic pregnancies and 203 non-anemic pregnancies in the Department of Obstetrics & Gynecology. Participants with hemoglobin concentration lower than 11 g/dl were included in the anemic group and 11g/dl or more in the non-anemic group. The study shows that the mean placental weight was 578.78 $\pm$ 141.80gm, mean birth weight was 2973.17 $\pm$ 680.97gm in the anemic group. Mean placental weight was increased in anemic pregnant women as well as decreased in non-anemic pregnant women and a significant difference was observed in this study. The second objective was to find out the correlation between placental weight and birth weight among non-anemic and anemic pregnant women. Findings revealed that there was a negative correlation between placental weight and birth weight ( $r = -0.105$ ) in non-anemic pregnant women and a positive correlation between placental weight and birth weight (0.027) and were non-significant at ( $p < 0.05$ ). The third objective was to find out the association between placental weight and birth weight with selected Socio-demographic variables in both groups. In the non-anemic group: The association between placental weight with selected Socio-demographic variables of non-anemic pregnant women was calculated with the help of ANOVA and unpaired 't'-test. The study concluded that it was non-significant with the Age of pregnant women (0.871), Educational status (0.891), Occupational status (0.185), Monthly family income (0.955), Type of family (1.000), Habitat (0.803), Lifestyle (0.839), Duration of marriage

(0.367), Dietary history (0.839) at  $p < 0.05$ . Similarly, the association between birth weight with Socio-demographic variables of non-anemic pregnant women was calculated with the help of ANOVA and unpaired 't'-test. The study was non-significant with the Age of subjects (0.820), Educational status (0.720), Occupational status (0.807), Monthly family income (0.667), Type of family (0.687), Habitat (1.000), Lifestyle (0.395), Duration of marriage (0.847), Dietary history (0.162) at  $p < 0.05$ .

In the anemic group: The association was found with the help of ANOVA and unpaired 't'-test with Socio-demographic variables of anemic pregnant women. The present study has drawn a conclusion that there was a significant association with the duration of marriage (0.041) at  $p < 0.05$ . But it was non-significant association with the age of subjects (0.217), Educational status (0.317), Occupational status (0.978), Monthly family income (0.607), Type of family (0.256), Habitat (0.693), Lifestyle (0.307), Dietary history (0.341) at  $p < 0.05$ .

The association between birth weight with Socio-demographic variables of non-anemic pregnant women was calculated with the help of ANOVA and unpaired 't'-test. In the study at the end, there was a significant association with monthly family income (0.001) at  $p < 0.005$ . But it was non-significant association with the age of subjects (0.511), Educational status (0.219), Occupational status (0.251), Type of family (0.649), Habitat (0.878), Lifestyle (0.672), Duration of marriage (0.138), Dietary history (0.383) at  $p < 0.05$ .

### Conclusion

The study concluded that placental weight was increased and birth weight decreased in anemic pregnant women. The results of the study also imply that early pregnancy registration, the provision of iron and folic acid supplements, the maintenance of dietary practice, and at least 4-5 antenatal visits in nine months all contribute to the improvement of the mother's health and hemoglobin level for the pregnancy.

### Conflict of interest

I clarify that I have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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