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ORIGINAL ARTICLE

Low Birth Weight and its Relationship with Anemia during Third Trimester among Females

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ABSTRACT

Background: Low birth weight (LBW) is a major problem in different societies especially developing countries.
Aim: To compare the frequency of anemia during third trimester among females with low and normal birth weight.
Study design: Descriptive cross sectional.
Methodology: Study conducted at Department of Obstetrics and Gynaecology, Jinnah Hospital, Lahore. Patients (n=160) were enrolled through probability convenient sampling. All babies underwent assessment for birth weight in minimum clothing using weighing machine following standard protocol and procedure and labeled as low or normal birth weight as WHO criteria. Data was evaluated by using SPSS v.24. Chi square was applied with P-value of <0.05 was considered as significant. Quantitative variables were presented as mean±SD while categorical data was presented as percentage.
Results: Mean age of participants was 27.1±5.1 years. There were 61 patients (38.1%) with parity ≤ 2 and 99 patients (61.9%) with parity >2. Comparison of frequency of anemia during 3rd trimester among females with low and normal birth weight revealed statistically significant difference (p=0.049*).
Keywords: Anemia, Low Birth Babies, Pregnancy and Parity.

INTRODUCTION

Low birth weight (LBW) is a major problem in different societies especially developing countries. Weight less than 2500g is taken as low birth weight. This health issue has many adverse effects that results in enormous physical, psychological, economic costs as well as social burden.[1] According to literature review, its prevalence ranges from 9-35% of live births in some developing countries, but are estimated to be substantially higher with unreliable incidences.[2] Moreover, these figures appear to be on the rise and show marked variation within the regions. A study conducted in Karachi showed a frequency of low birth weight as 10.6% while another study conducted in Rawalpindi reported a frequency of 27.4%[3,4].

Anemia of pregnancy is quite common issue faced by females that is associated with high morbidity and morbidity among them. The prevalence of anemia among pregnant females in Pakistan ranges from 24% to 91% which has brought Pakistan in the category of countries where anemia is a severe public health problem.[5] Studies have shown inconsistent results regarding its relationship with low birth weight. Studies showed a significant relationship between low birth weight and anemia during the third trimester of pregnancy[6,7].

One study reported the frequency of anemia among low birth weight as 20% as compared to 7.5% among normal birth weight babies[8]. Similarly another study reported anemia in 69.81% of the low birth weight babies as compared to the 52% in normal birth weight babies[9]. However, substantial evidence is also there showing that there is no effect of anemia on the birth weight of babies[10,11]. This makes the relationship between low birth weight and anemia as controversial. The rationale of this study is to determine the frequency of low birth weight and its relationship with anemia among females delivering in labor room of tertiary care hospital. The prevalence of low birth weight has shown variation while studies conducted so far regarding the relationship of low birth weight with anemia has also shown similar trends and inconsistencies.

Thus, this study provided information regarding the magnitude of low birth weight and generated further evidence regarding the relationship of anemia with low birth weight. This study highlighted the importance of timely management of anemia in context with the prevention of low birth weight and provided baseline data to conduct further research regarding the causative factors of low birth weight and pathogenesis and management of low birth weight due to anemia to avoid these preventable consequences.

Objective was to compare the frequency of anemia during third trimester among females with low and normal birth weight.

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METHODOLOGY

It was a descriptive cross sectional study conducted at Jinnah Hospital-Lahore. Patients (n=160) were enrolled through probability convenient sampling. All babies underwent assessment for birth weight in minimum clothing using weighing machine following standard protocol and procedure and labeled as low or normal birth weight as WHO criteria. Females having Age (18-35 years), delivering in the labour room of tertiary care hospital with gestational age >37 weeks on LMP were included. Females who had parity > 5, multiple pregnancies on ultrasound, ante-partum hemorrhage and diabetes were excluded. Complete history and examination was done at time of enrollment. Informed consent was taken. Baseline investigations were done at start of study.
Statistical analysis: Data was evaluated by using SPSS v.24. Chi square was applied with P-value of <0.05 was considered as significant. Quantitative variables were presented as mean ± SD while categorical data was presented as percentage.

RESULTS

Mean age of participants was 27.1±5.1 years while mean gestational age was 38.6±1.2 weeks. There were 61 patients (38.1%) with parity ≤2 and 99 patients (61.9%) with parity >2 as summarized in table-1.

Table-1: Demographic parameter of enrolled participants

Parameters	Categories	Number (%)
Age (years)	18-25	63 (39.4%)
	16-35	97 (60.6%)
Mean ± SD	27.1 ± 5.1	
Gestational Age (week)	37.1-40	147 (91.9%)
	40.1-42	13 (8.1%)
Mean ± SD	38.6 ± .2	
Parity (weeks)	≤ 2	61 (38.1%)
	> 2	99 (61.9%)
Gender of Baby	Males	89 (55.6%)
	Females	71 (44.4%)

Low birth weight was found in 137 cases (85.6%) as shown in figure-1 and anemia in 111 mothers (69.4%). Majority of females

had anemia in third trimester (figure-2) while minority had low birth weight.

Figure-1: Low birth weight cases distribution

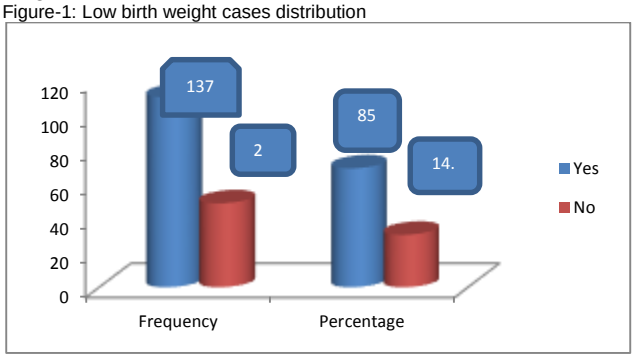
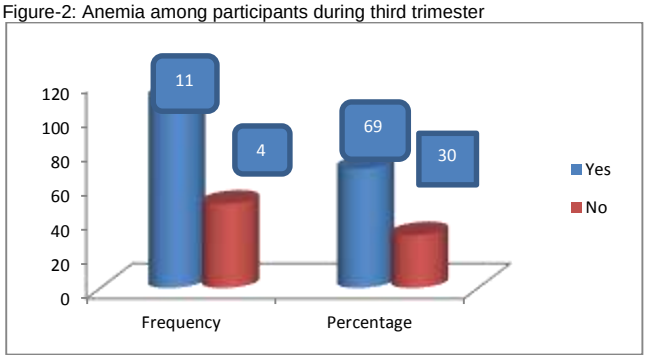


Figure-2: Anemia among participants during third trimester



Comparison of frequency of anemia during 3rd trimester among females with low and normal birth weight revealed statistically significant difference (p=0.049).

Table-2: Anemia among females with low and normal birth weight

Anemia	Low birth weight		Total	P value
	Yes	No		
Yes	20	91	111	
No	3	46	49	**0.049***

*Statistically significant

Data was stratified for age among participants with respect to anemia for having low birth weight as shown in table-3.

Table-3: Data stratified for age among participants

Age (Year)	Anemia in 3rd trimester	Low Birth Weight		Total	P value
		Yes	No		
18-25	Yes	11	32	43	**0.013***
	No	0	20	20	
26-35	Yes	9	59	68	0.692
	No	3	26	29	

*Statistically significant

DISCUSSION

Weight less than 2500g is taken as low birth weight according to literature review and WHO criteria. Many studies have reported that low birth weight babies catch more infections and have high death rates[12,13]. There are many factors (diet, social, economics and lifestyle) that contribute to low birth weight deliveries during or before pregnancy[14]. One study reported that nutritional deficiency of iron, vitamin-B12 and folic acid contribute to poor outcomes of pregnancy[15].

According to many previous studies, ionic iron plays a role in formation of new hemoglobin. Hemoglobin is the carrier and transporter of oxygen transportation in blood to various organs of body.[16] Anemia during pregnancy is usually caused by deficiency of iron resulting in defective erythropoiesis or presence of infections. Infections influence the metabolism of new hemoglobin as per literature review[17].

Few studies analyzed reported that hemoglobin less than 11g/dl increases LBW risk in the first trimester.[18] Our results were in line with many previous studies as women having anemia had babies with low birth weight as shown by p-value of 0.049. Similarly many previous studies showed a positive relationship between anemia of pregnancy and low birth weight[18,19] thus supported our findings.

Limitations of study: Financial constrains and limited resources with no genetic workup and long follow-ups added to limitations. It was a single centre study.

CONCLUSIONS

It was concluded that there was an association of maternal anemia in pregnancy with increased risk of LBW babies. However more studies will be required to develop relationship between anemia and pregnancy outcomes.

Author's contribution: MF, SN&SR: Overall supervision and Write up and literature review, **AAS&AN:** Literature review help in write-up.

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