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ORIGINAL ARTICLE

Mean Placental Birth Weight Ratio at Term in Primigravidae

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ABSTRACT

Objective: To determine the mean placental birth weight ratio at term in primigravidae

Study design: Cross-sectional study

Place and Duration: Department of Obstetrics and Gynecology, Civil Hospital Karachi, duration was six months after the approval of synopsis from 1st January 2016 to 30th June 2016

Subjects and Methods: A total of pregnant women who fulfill the inclusion criteria were included in this study. After delivery, baby was weighed by using weight machine and weight of baby was also noted (as per operational definition). After expulsion of complete placenta, placental weight was measured by using weight machine. The placental-birth weight ratio (PBWR) were calculated as ratio of placental weight to neonatal weight multiplied by 100.

Results: Mean ± SD of maternal age was 24.77±4.04 with C.I (24.11----25.42) years. Mean ± SD of placental weight was 505.84±99.97 with C.I (489.71----521.97) grams. Out of 150 neonatal babies 101 (67.3%) were male and 49 (32.7%) were female. Mean placental birth weight ratio was found to be 16.82±2.63 with C.I (16.39----17.24).

Conclusion: It is to be concluded that placental weight increased according to the birth weight. The placental weight to birth weight ratio decreased slightly with advancing gestational age.

Keywords: Placental weight, Birth weight ratio, Labour at term, Primigravidae

INTRODUCTION

A mother's health, the health of her unborn child, the likelihood of maternal sickness and perinatal mortality, as well as the likelihood of having a healthy kid, are all influenced by the weight of the placenta and the weight of the baby at delivery [1-5].

As the gestational age grows, the placental birth weight ratio (PBWR) decreases, which is defined as the placental weight divided by the birth weight. Before the considerable gains in foetal weight that occur in the third trimester, the majority of placental growth is accomplished by the end of the second trimester. Asia and Western Europe each have about 20% and 19.5 percent [6] of the world's population, respectively. Premature placenta or fitness with a predicted diminished reserve are linked to a variation in PBWR (placental birth weight ratio). Cesarean births had a lower mean birth weight than vaginal births, but their placental weights are larger [6], according to one study. Pregnancy-induced hypertension (PIH) is linked to it. Many studies have revealed that those with aberrant PBWR have a greater risk of developing cardiovascular disease. Low APGAR score, respiratory distress, and perinatal death are all linked to an increased placental weight, while a low placental weight is linked to a mother's medical condition like hypertension.

Placental weight and the fetal-to-placental weight ratio (F/P ratio) are linked to the pregnancy's outcome, according to the College of American Pathologists [8]. Approximately 60% of the 4 million newborn fatalities reported were due to prenatal illness (40,7%) and mortality (33%) in kids whose birth weight was below the recommended range of 2.5-4 kg [9-10].

A higher incidence of perinatal illness and death has been found in studies correlating placental weight differences with variations in the neonatal birth ratio. Another population-based cohort study found a negative correlation between birth weight and cardiovascular disease in adults [11]. SGA newborns were detected in 14 percent of pregnancies with placental weights below 10 percent, according to Eskild et al [12]. It was found that PBWR (placental birth weight ratio) ranged from 10.1 to 28.86 in the Nigarian study. According to Saeed et al [14], the mean placental birth weight ratio is 6.03580.042, which is lower in hypertension women than in normotensives. Data from the Pakistani population has been scarcely reported. Because it varies among different races and ethnic groups, we set out to find the mean placental/birth weight ratio in term pregnancy in the Pakistani population. Also, it is essential determinant of future cardiovascular diseases our investigation will assist us to identify woman with aberrant PBWR and counsel the relating risk of future cardiovascular disease in their offspring's and its prevention.

MATERIALS AND METHODS

This cross sectional study was conducted at the department of Obstetrics & Gynecology of Civil Hospital Karachi, the duration of study was six months from 1st January2016 to 30th June 2016. Calculated from mean of placental birth weight ratio =6.0358±0.04214 the sample size would be n=150 confidence level 99% and margin of error 0.02. Patients were ages between 20 to 35 years. Patients with gestational diabetes, women with hypertensive disorder, multiple pregnancy, renal failure, intrauterine death, abruption placentae, placenta previa and women with morbidly adherent placenta were excluded.

Written informed consent was obtained from pregnant women at term show fulfill inclusion criteria. Detailed history and examination were done to exclude medical disorder or obstetric complication of pregnancy listed in exclusion criteria. After delivery placenta was placed on dry sheet, amniotic membrane and umbilical cord will trimmed with scissors by after cleaning and warming after birth this was also done by researcher. The placental-birth weight ratio (PBWR) was calculated as ratio of placental weight to neonatal weight multiplied by 100. All data (name, age, weight, height, BMI, gestational age in weeks, placental weight, neonatal weight, neonatal gender, APGAR score, mode of delivery and placental birth weight ratio was entered in predefined performa by researcher.

After collection of data, the analysis was done using SPSS software version 20. Mean and SD were calculated for numerical variables i.e. maternal age, gestation age, BMI (weight in kgs /heights in meter square), placental weight and neonatal weight. Categorical variable i.e. neonatal gender low APGAR score, mode of delivery was expressed through frequency and percentage.

RESULTS

Mean ± SD of maternal age was 24.77±4.04. Mean ± SD of gestational age was 38.94±1.51, mean ± SD of BMI was 25.44±3.11Kg/m^2. Mean ± SD of placental weight was 505.84±99.97 grams. Mean ± SD of neonatal weight was 3056.53±657.79 with grams. (Table No 1)

Table No 1: Baseline characteristics of all the patients

Variables	MEAN	±SD
Age (years)	24.77	4.044
Gestational Age (weeks)	38.94	1.51
BMI (kg/m)	25.44	3.11
Placental weight (grams)	505.84	99.97

Out of 150 neonatal babies 101 (67.3%) were male and 49 (32.7%) were female as shown in Figure 1.

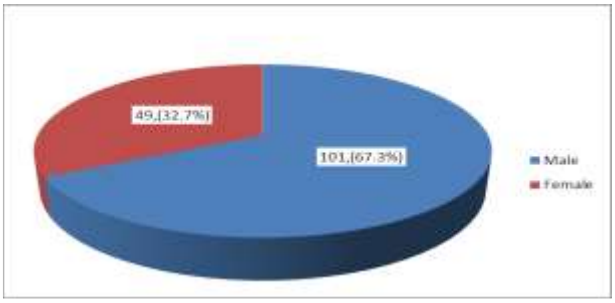

Figure No 1: Gender-wise distribution of neonates

Low Apgar Score was found in 33 (22%) neonates, Mean ± SD of neonatal weight was 3056.53±657.79 with C.I (2950.40----3162.66) grams. (Table 2)

Table No 2: Apgar Score and birth weight of neonates

Variables	Frequency No.	%age
Mean Birth Weight (grams)	3056.53±657.79	-
Low Apgar Score		
Yes	33	22%
No	117	78%

Most of women gone through vaginal delivery i.e. 114 (76%) and 36 (24%) had caesarean as shown in **Figure 2**

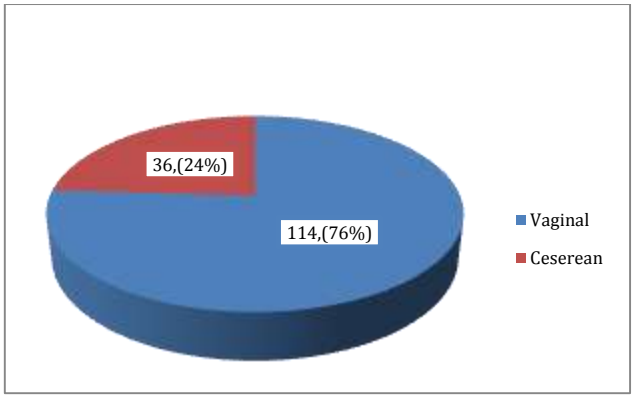

Figure No 2: FREQUENCY OF MODE OF DELIVERY

Mean placental birth weight ratio was found to be 16.82±2.63 with C.I (16.39----17.24) as shown in **Table 3.**

Table No 3: MEAN PLACENTAL BIRTH WEIGHT RATIO (n= 150)

MEAN	16.82
±SD	2.63
95% Confidence Interval	16.39…….17.24
MEDIAN	16.98
RANGE	14
INTERQUARTILE RANGE	3

In stratification of Mean placental birth weight ratio with respect to neonatal gender, low Apgar score, and mode of delivery, were done from (Table 4-6).

Table No 4: STRATIFICATION MEAN PLACENTAL BIRTH WEIGHT RATIO RESPECT TO NEONATAL GENDER

GENDER	n	MEAN	±SD	P-VALUE
MALE	49	16.72	2.28	0.751
FEMALE	101	16.86	2.80	

Table No 5: STRATIFICATION MEAN PLACENTAL BIRTH WEIGHT RATIO RESPECT TO LOW APGAR SCORE

LOW APGAR SCORE	n	MEAN	±SD	P-VALUE
No	117	16.98	2.57	0.183
Yes	33	16.24	2.82	

Table No 6: STRATIFICATION MEAN PLACENTAL BIRTH WEIGHT RATIO WITH RESPECT TO MODE OF DELIVERY

MODE OF DELIVERY	n	MEAN	±SD	P-VALUE
VAGINAL	114	17.08	2.73	0.013
CESEREAN	36	15.97	2.13	

DISCUSSION

Because the placenta is so important to pregnancy and foetal growth, healthcare providers can benefit greatly from a thorough examination and anthropometric measurements of the organ. Placental weight is a simple measure that can be recorded simply and accurately, and its connection with pregnancy abnormalities has tremendous clinical interest [15]. Recently, it has been discovered that in women with normal blood pressure throughout pregnancy, placenta and birth weight are highly related [6,8]. Low birth weight raises the risk of high blood pressure, stroke, and coronary heart disease in the future, according to a study that looked at the link between placental and birth weight. In addition, in parturients who had an ART pregnancy, a disparity between placental weight and birth weight as well as a placental weight/birth weight ratio was documented [17]. Since parturients who received ART had larger placentas and higher placental weight/birth weight ratios, it stands to reason that women who spontaneously gave birth would have smaller placentas and lower placental weight/birth weight ratios. Premature foetal and neonatal death during the perinatal period can be better predicted by the birth weight-placental weight ratio than placental weight alone [18]. If it's larger than normal, it's been linked to future high blood pressure and other significant cardiac disorders [19]. At term 37 to 42 weeks, the typical range was 6.5 to 7.1, while values between 6.3 to 8.46 were also reported [21].

Placental weight: birth weight ratio [22,23] and birth weight: placental weight ratio [23,24] have been reported in a variety of ways, but the correlation will always be the same regardless of how it is presented.

The mean placental weight of 505.84–99.97 (grammes) was found in this study, which is near to the 515–84.97 and 530–76.97 (grammes) reported in western Europe and eastern Nigeria, respectively [24–25].

However, in Asia and Ukraine, it has been reported to weigh more than 470 g [26].

When preparing and weighing placentas, it is possible that different methods and times for cord clamping are to blame for the variance in placenta weight. Ethnicity and other as-yet-unidentified factors have been implicated in the variation in placental weight. There was a significant difference in the birth weight of the neonates in this study between the Ukraine, western Europe, and eastern Nigeria; nonetheless, it was higher than the 3036 g in Asia and 3103 g in the Afro-Caribbean region. Some of these variations in average birth weight can be attributed to altitude, maternal nutrition, or illnesses in the mother [28].

The average placental birth weight ratio in our research was 16.82 2.63. According to the results of the Nigerian investigation PBWR 18.13.43, this conclusion is correct. The average placental birth weight ratio was 5.711.03 in Ashwani et al's study [29].

Due to the strictness of our inclusion and exclusion criteria, we had to rely on successive sampling as the most effective sampling strategy. It is also possible to reduce bias in our investigation by defining variables objectively. In our investigation, we used a weak cross-sectional design, which has restricted analysis and strength of evidence, and hence does not require prior sample size calculation. Our study's value is impacted by the fact that we only focused on a small number of outcomes. Our study may have included a wide range of variables and factors that have an impact on our predictor and outcome variables. Non-probability sample further restricts generalizability; nevertheless, we only had a small number of patients and the follow-up time was short, so our findings can be generalised.

A hospital-based study explains why this number does not accurately represent how common and severe the condition really is. Furthermore, because the research was conducted in only one unit at a single hospital, it cannot be extrapolated to a broader population.

CONCLUSION

It is to be concluded that placental weight increased according to the birth weight. The placental weight to birth weight ratio decreased slightly with advancing gestational age. Abnormal placental weight and its ratio were significantly associated with some adverse pregnancy outcomes.

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