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Research Article

STUDY TO KNOW THE EFFECTS OF PLACENTAL WEIGHT AND BIRTH WEIGHT RATIO (PW/BW) ON PERINATAL OUTCOME AND THEIR RELATIONSHIP

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Abstract:

Objective: Placental weight / birth weight ratio (PW / BW) has been shown to be related with some long-term fetal outcomes; however, its relationship with short-term outcomes has not been determined yet. The aim of this study was to evaluate the relationship between PW / BW ratio relationship and short-term adverse obstetric outcome for gestational age (AGA) in full-term neonates.

Study Design: A Prospective, randomized study.

Place and duration: In the Obstetrics and Gynecology department of Sir Ganga Ram Hospital Lahore for one year duration from January 2018 to January 2019.

Methods: In our study, three groups of neonates were taken and compared according to PW / BW ratio (low, normal and high). Our primary outcome is the ratio of NICU admissions of neonates and <7 minutes Apgar score with secondary results.

Results: Our study showed that the increase ratio of PW / BW group result in much admission in NICU and Apgar score <7 in 5 minutes as with normal PW/BW ratio comparison. The decrease PW / BW ratio group have less NICU admission rates. The high rate of PW / BW was significantly associated with short-term inverse perinatal outcomes.

Conclusion: The PW / BW relationship can predict the newborns short-term health risks.

Key words: Placental Weight, Birth Weight, Pw / Bw Ratio.

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INTRODUCTION:

The placenta (the life of the fetus in the uterus) works differently to support the growth of the fetus, interacting with the two individuals, the mother and the developing fetus. It is the most accurate record of the baby's prenatal experiences [1]. Pregnancy complications that are related with increase perinatal mortality and morbidity reviewed in the placenta both microscopically and macroscopically [2]. The placenta development has been shown to be effective on the birth weight and the weight of the placenta [3]. Therefore, two ratios were studied extensively to determine the relationship between long-term adverse fetal outcomes. For example, the high rate of PW / BW was noted to be linked with high risk of coronary heart disease, hypertension in adulthood, impaired glucose tolerance and cardiovascular mortality. Most of the studies agree that the high rate of PW / BW is related with long-term fetal outcomes [4]. For example: the development of diabetes / hypertension. Somehow they did not draw much attention to their correlations or correlations with short-term outcomes. Therefore, we would like to focus on this issue in our study [5]. As Abubakar et al show, there is a positive relationship between birth weight and placental weight of the newborn [6]. Placental weight is "functionally significant" because it relates to villi surface area and fetal metabolism [7]. In contrary to long duration spent on analysis of PW / BW and fetal outcomes in long-term, the relationship between short-term fetal outcomes not studied much [8]. By Wong and Lao only one analysis has been done which shows low Apgar score (<7.0) in non-diabetic mothers with increase PW / BW [9].

MATERIALS AND METHODS:

This Prospective study was held in the Obstetrics and Gynecology department of Sir Ganga Ram Hospital Lahore for one year duration from January 2018 to January 2019. The patient's consent was obtained after explaining our study plan. The study was approved by the ethics committee. All births (gestational week 37 weeks to 40 weeks) were included in the study. The size of our sample was 120 pregnancies.

Inclusion Criteria:

The inclusion criteria were all patients who received study approval from 37 to 40 weeks of age.

Exclusion Criteria:

The exclusion criteria included patients who have not given consent and withdrawn from the study with patients of intrauterine death, multiple pregnancies, congenital anomalies in newborns, mothers with

chronic diseases and long-term drugs, antepartum hemorrhage (APH), and adhesive placenta. Patients with pregnancy Age unknown, unverified, premature birth, abnormal placenta, abnormal cord were also not included.

Selection method of different groups: In order to know the different values required for our study, we made a general survey of 200 patients. The mean placental weight ratio was 18.3%, 10%, 15.95%, 90%, 22.4%. For this reason, we chose the cutoff value that creates the following three groups.

The first group of 40 patients with a low PW / BW ratio is of 12 to 15.99.

The second group of 40 patients with a normal PW / BW ratio is of 16 to 19.9.

The third group of 40 patients with a high PW / BW ratio is between 20 and 35.

Preparation of Placenta:

Accurate weighing of the placentas was performed by cutting all membranes and cutting the umbilical cord at the site of the placenta. Superficial fetal veins were evacuated from all blood. Adhesive blood clots were removed from the maternal surface. The placenta was weighed three times in a digital device calibrated to the nearest scale. Weights recorded. Weighing was performed within one hour after delivery. The birth weight of the newborn was recorded immediately after delivery until the nearest weight in the electronic weighing machine. Apgar scores were recorded at 1 and 5 minutes. The PW and BW ratios multiplied by 100 were calculated and divided into 3 groups (high, normal, low) as PW / BW ratio.

After comparing all data, different important tests were applied in the statistics to know the difference and importance of PW / BW relationship in different conditions.

Data analysis was performed using the 18th version of SPSS for the window. ANOVA, Chi-square test, ratio test were used to determine the importance of placental weight / weight, NICU, apgar score and medical disorders at birth. 'P' <0.05 was considered significant.

RESULTS:

In our study, we compared the subgroups of three PW / BW ratios (12 to 15.99), normal PW / BW ratio (16-19.9) and high PW / BW ratio (20-35), and our study showed the following results. Placental weight (in gms) The low PW / BW ratio (474.38 ± 80.33), the normal PW / BW ratio (472.50 ± 44.42), the high PW / BW ratio (492.75 ± 81.27) and the mean \pm SD of P value > 0.05.

Table 1: NICU admission, APGAR score of the high and normal PW/BW ratios group

Parameter	High (%) (n=40)	Normal (%) (n=40)	OR	95% CI	P Value
NICU admission	12 (30)	3 (7.5)	5.28	1.36 – 20.53	<0.01
APGAR score<7	12 (30)	0	-	-	<0.0001

This means that a high PW / BW ratio has increase placental weight greater than the low and normal PW / BW ratio, but the value of P is not statistically significant as > 0.05 . The PW / BW ratio was the mean \pm SD of 18.3% and SD 5.08, Comparison of

obstetric results between normal and high PW / BW groups. The high PW / BW group has higher risk of NICU admission with an APGAR score <7 after 5 mints. The obstetric results comparison between low and normal PW / BW groups is given in Table.

Table 2: NICU admission, APGAR score of the low and normal PW/BW ratios group

Parameter	Low (%) (n=40)	Normal (%) (n=40)	OR	95% CI	P Value
NICU admission	2 (5)	3 (7.5)	0.65	0.10 – 4.11	>0.05
APGAR score<7	0	0	-	-	-

In contrast to the above, the comparison of the low relation group with the normal PW / BW association group in our analysis showed a lower or comparable perinatal outcome risk for the same variables evaluated. The predictive variables in our study

included HTN, DM, IUGR, oligohydramines, anemia. The rate of PW / BW in hypertensive patients and the number of patients who admitted in NICU were compared with other variables (as shown in Table 3).

Table 3: Association between medical disorder and PW/BW ratios in study group

Medical disorder	PW/BW ratio			Chi-square	P Value
	Low	Normal	High		
DM	1	3	2	1.05	>0.05
HTN	1	6	20	27.81	<0.0001
IUGR	0	0	11	24.22	<0.0001
Oligohydraminos	3	1	5	2.88	>0.05
Anemia	0	1	3	3.62	>0.05
Rh negative	1	1	1	0	>0.05

DISCUSSION:

The placenta plays a important role in development of normal fetus and fetal disorders may be caused by the weight gain and poor functioning of the placenta [10]. The factors affecting height, weight and placental weight parity of the mother are increased placental size are associated significantly with weight of mother and is a birth weight independent predictor [11]. The low birth weight and Placenta size were shown as factors estimate high blood pressure in adulthood [12]. Fetal or Maternal diseases (severe anemia, gestational diabetes, fetal hydrops, hypertension) have been shown to affect fetal and placental weight [13]. The places with the highest

blood pressure occurred later in life, which was the smallest baby with placenta. Other studies have shown that placental weight plays an important role in fetal growth in terms of body length, length and weight while a lesser correlation between these factors and placental weight has been demonstrated placenta rate intrauterine growth retardation, pregnancy caused by high blood pressure, etc. Complicated pregnancy with uncomplicated pregnancy and women in women both tend to increase in the AGA group. In pregnancies with hypertension, placental weight is high [14]. Our results show that high and low placental weight prevalence is observed in preeclampsia. In our study,

birth weight was comparable between three groups and eliminated the effect as a confusing factor in negative results. The division of our groups into low, normal and high relationships led to a better reflection of trends in negative obstetric variables¹⁵. Our aim is to closely examine the effect of PW / BW on several short-term perinatal outcomes in full-term AGA neonates.

CONCLUSION:

Our study demonstrates a strong relationship between the placenta and the fetus, indicating that the fetus's well-being is largely due to the placenta because it serves as a link between the mother and the developing fetus for nutritional support, excretory functions and immunological and hormonal support. The best indicator of fetal weight is placental weight. A critical umbilical cord and placenta examination should be performed immediately after birth in order to determine the goodness of the baby. We believe that the PW / BW relationship can serve as an easy clinical marker for short-term inverse obstetric outcomes, and that calculating the PW / BW ratio is simple and easy and can be applied in primary health centers.

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