

ORIGINAL ARTICLE

**Association between Height of the Patients and Cephalopelvic
Disproportion in Primigravidas**

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ABSTRACT

OBJECTIVE: To determine the association between short stature and cephalo-pelvic disproportion among primigravida women with Pakistani population.

METHODOLOGY: A case-control study was carried out after approval of CPSP from November 2018 to May 2019 at Obstetrics and Gynecology department of Jinnah Postgraduate Medical Center, Karachi. The primigravida pregnant women with the gestation age of 37 weeks or above and presented for a normal vaginal delivery with vertex presentation of the fetus and developed cephalopelvic disproportion during labor was included in this study and primigravida pregnant women having an estimated fetal weight more than 3.5 Kg, patients having physical disability was excluded. A total of 238 primigravida patients fulfilling inclusion and exclusion criteria were selected. Informed consent was taken from each individual participated in this study. The age, height, gestational age, fetal mal-presentation, prolonged Labor, and caesarian delivery parameters were observed within the patients and data were analyzed through SPSS version 19.

RESULTS: The 21(17.6%) of patients with cephalopelvic disproportion was short stature in case group and 7(5.9%) in the control group, the results showed the significant association of cephalopelvic disproportion with short stature patients. The ratio of caesarian delivery was also higher and a significant p-value was obtained.

CONCLUSION: The mothers with cephalopelvic disproportion were independently correlated with a higher rate of short stature and caesarian rate is the highest among the CPS women.

KEY WORDS: Short stature, Cephalopelvic disproportion, Primigravida.

INTRODUCTION

Cephalopelvic disproportion is one of the common obstetric complications. Cephalopelvic disproportion may lead to severe complications in mother and child when it not diagnosed and managed timely. Complications of developing CPD include prolonged labor, moulding, and caput formation, obstructed labor and fetal distress¹. Therefore, it is necessary to predict cephalopelvic disproportion as early as possible to avoid such serious complications. Cephalopelvic disproportion is defined as, the anatomical disproportion between fetal head and maternal pelvis. It is developed either by maternal or fetal causes. The fetal causes include increased fetal weight, hydrocephalous, malposition, and maternal causes include short height or small pelvis, metabolic bone diseases, previous fracture. Women of small height (<1.60m) with comparatively a large baby in their pelvis are more likely to develop CPD especially in their first pregnancy². Regarding Cephalopelvic Disproportion related complications a study showed that increasing maternal height reduced chances of developing intrapartum fetal head moulding³. Cephalopelvic disproportion is an independent risk factor for cesarean section in nulliparous patients with an odd ratio of 2.98 (95% CI=1.31) $p<0.05$ ⁴. The primigravidas are considered a high risk group and require regular assistance in the form of antenatal care and this may help them during their pregnancy, labor, and puerperium⁵.

The cephalopelvic disproportion can be predicted to some extent by maternal anthropometric measurement, by combining these measurements with clinical estimates of fetal weight, it defines predictive value to a relatively modest degree⁶. The rate of developing cephalopelvic disproportion is still higher in short stature parturient even after control of birth weight, parity, type of attendance in antenatal care unit⁷.

The aim of this study was to investigate cephalopelvic disproportion complications and its associations with short stature along with percentages of cesarean section in our cohorts of the patient with complications of cephalopelvic disproportion case group and a normal control group of selected pregnant women.

MATEHODOLOGY

A Case-Control study was conducted in the Obstetrics and Gynecology department of Jinnah Postgraduate Medical Center, Karachi. The synopsis was approved by CPSP and after approval of the synopsis informed consent was taken. The study was started from November 20, 2018 to May 20, 2019.

The primigravida women were included in this study who admitted at JPMC Obstetrics and Gynecology departments for antenatal care. The primigravida pregnant women with the gestation age of 37 weeks or above and presented for normal vaginal delivery with vertex presentation of the fetus and developing cephalopelvic disproportion during labor.

The primigravida pregnant women having an estimated fetal weight more than 3.5 Kg, patients having a physical disability like polio, history of pelvic fracture and ricket and abnormal placenta such a placenta previa, placental abruption, and placental adhesion on ultrasound and estimated fetal weight of more than 3 kg were excluded.

Non-probability A convenient sampling technique was used in this study. The calculated sample size was 119 in each group, at 95% confidence level and power of 80% with an expected proportion of outcome among a control of 2.7% among control and 12.2% among cases.

A total of 238 primigravida patients fulfilling inclusion and exclusion criteria from the department of gynecology and obstetrics unit 2 of JPMC were selected. Informed consent was taken from each enrolled patients in this study. The women undergoing labor were followed and observed for the progress of labor, during the vaginal examination it was observed that cervical dilatation and descent of fetal head is not engaged if cervical dilatation is less than 1cm per hour. There was severe moulding and caput formation was seemed thereafter obstructed labor and further management was done.

Data were entered and analyzed using SPSS vs. 19. Mean and the standard deviation were calculated for continuous variable including maternal age, gestational age, and height of the patient and time of the labor. Frequency and proportions were calculated for categorical variables such as fetal mal-presentation, prolonged labor, and course of delivery. Logistic regression was applied to assess the possible association between maternal height and cephalopelvic disproportion. P-Value of <0.05 were considered significant.

RESULTS

Total 238 primigravida pregnant women were selected after the completion of inclusion criteria, out of from 238 participants, 119 were of primigravida pregnant women with cephalopelvic disproportion complications and 119 of primigravida pregnant women were enrolled as a control group without complications of cephalopelvic disproportion.

In this study, we have recorded the age, height, and gestational period, fetal mal-presentation prolonged labor and caesarian delivery, and maternal period of enrolled pregnant women of both case and control group. The SPSS software version20 was used for descriptive statistics of all quantitative and qualitative variables for both selected groups. The recorded mean age of the patients was 22.1 ± 3.3 years and in the control group mean age was 21.6 ± 4.3 years. The mean height in the case group was 156.9 ± 7.3 cm and 161.6 ± 8.8 cm in the control group. The mean gestational age of the patients was 37.6 ± 0.45 weeks in the case group and 37.8 ± 0.39 weeks in the control group (Table I). In total selected patients 11.7% (28/238) patients were short sutured between 128cm (4.2 feet) to 146.3 cm (4.8 feet), and 89.4% (213/238) patients were normal height in between 149 cm (5 feet) to 164.6 (5.4 feet). The fetal mal-presentation was observed in 14.7% in the case group and 8.4 % were in the control group. The 42% (50/119) women were suffered prolonged labor pain in case group patients and 25.2% (30/119) in control group. The 98.32% (117/119) women were born babies through caesarian delivery and the p-value showed a significant association with selected parameters (Table I).

Only 17.6% (21/119) of pregnant women with cephalo-pelvic disproportion in the case group and 5.9% (7/119) pregnant women in the control group were short in stature. In the present study the both control groups were divided on the bases of maternal age under 30 years and more than 30 years of age. We were observed that 22.1% (15/119) of pregnant women who had less than 30 years of age were short stature in the case group and 4.5% were short stature in a control group, and percentage of normal heights seemed highest in both groups along with both maternal ages (Table II).

The difference have been found to be significant (P-value: 0.005) and Odds Ratio also showed higher association stratification with respect to age and gestational age were stated and gestation age also showed a significant association between short suture and cephalo-pelvic disproportion.

TABLE I: MEAN VALUES OF DIFFERENT AND PERCENTAGE OF VARIABLES

Parameters	Cephalopelvic disproportion N = 119	Controls N = 119	P value
Age	22.1(3.3)	21.6(4.3)	0.32
Height	156.9 cm	161.6 cm	0.0001
Gestational Age	37.6(0.45)	37.8(0.39)	0.0001
Percentage			
Fetal Mal-Presentation	14.7% (17/119)	8.4% (10/119)	0.153
Prolonged Labor	42% (50/119)	25.2% (30/119)	0.006
Caesarian delivery	98.32% (117/119)	13.45% (16/119)	0.0001

TABLE II: P VALUES OF SELECTED PARAMETERS OF CASE AND CONTROL GROUP

Parameters	Short Stature	Cephalopelvic disproportion N = 119	Controls N = 119	p value
Height Status	Yes	17.6%(21/119)	5.9% (7/119)	0.005
	No	82.4%(98/119)	94.1% (112/119)	
Maternal age				
Less than 30 years (n=134)	Yes	22.1%(15/119)	4.5% (3/119)	0.003
	No	77.9%(53/119)	63(95.5%)	
More than or equal to 30 years (n=104)	Yes	11.8% (6/119)	7.5% (4/119)	0.466
	No	88.2%(45/119)	92.5% (49/119)	
Gestational age				
37 weeks (n=168)	Yes	12% (10/119)	4.7% (4/119)	0.085
	No	88% (73/119)	85.3% (81/119)	
> 37 week (n=70)	Yes	30.6%(11/119)	8.8% (3/119)	0.023
	No	69.4%(25/119)	91.2% (31/119)	

DISCUSSION

Risk of obstructed labor and caesarean section are higher in women with short stature due to cephalo-pelvic disproportion. However, if birth weight is low some women with short stature may deliver vaginally. The purpose of the study is to determine the cut off value of height in primigravida at which women should not be given a trial of labor and hence the incidence of obstructed labor due cephalo-pelvic disproportion and its consequences may be decreased^{8,9}.

The cephalopelvic disproportion complication is a common health problem in pregnant women and caused 3-8% of the deaths in pregnant women worldwide¹⁰. In advanced countries, significant maternal deaths were caused due to obstructed labor pain and uterine ruptured¹¹. Among the different ethnic groups the distribution of maternal height is varied, the South Asian women are typically shorter in height than western women¹². In the Pakistani population, many women died during the pregnancy and many cases were not report and not well information was recorded due to unavailability of perinatal diagnosis by health care centers and the reason to cause several casualties.

This study showed that ratio of caesarian delivery is higher among the women as compare with normal birth and cephalopelvic disproportion patients faced prolonged labor pain, moulding and caput formation, obstructed labor and fetal distress. The study supports the previously designed study and cephalopelvic disproportion is highly corrected with short stature.

CONCLUSION

A few studies have been done on cephalopelvic disproportion with the association of stature in different world populations with diverse ethencity. This study indicate the proportion of deliveries with cephalopelvic disprppotion in Pakistani population and show the significant association of cephalopelvic disprppotion with height of females. The findings may be helpful to manage the caesarian deliveries and reduce the risk of prenatal mortality.

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AUTHOR CONTRIBUTIONS

Roshan S: Study design, draft writing for manuscript, data collection

Phulpoto M: Data interpretation and critical review

Nigar R: Draft writing for manuscript, critical review of manuscript

Ahmad S: Critical review of the manuscript and drafting.

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