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The Incidence of Placenta Previa among Women with Subsequent Pregnancy after Previous Cesarean Sections

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Abstract

Background: Placenta previa is one of the leading causes of vaginal bleeding in second and third trimester of pregnancy. The risk of placenta previa is also higher among women with previous cesarean section. The purpose of our study was to determine the frequency of placenta previa among patients undergoing repeat cesarean section.

Materials and Methods: This Cross-sectional study was conducted at the Department of Gynecology, Lahore General Hospital, Lahore. The calculated sample size was 240 cases recruited through non probability purposive sampling. All the patients underwent an obstetrical scan for the presence of placenta previa. The women who were detected with placenta previa were further enquired for the numbers of previous cesarean section. The data was collected on specifically designed proforma (attached). All the collected data was entered into SPSS version 10 and analyzed. The qualitative data like presence of placenta previa (yes or no) was presented as frequency and percentage.

Results: There were 240 females included in the study with the mean age of 30.41 ± 5.47 years. The mean gestational age was 34.50±2.97 weeks. There were 233 (97.08%) females who did not develop placenta previa while 7 (2.92%) females had placenta previa. There was insignificant difference observed for frequency of placenta previa with age of females, parity and cesarean section (P>0.05).

Conclusion: The incidence of placenta previa is found to be low in local population who had multiple cesarean section.

Keywords: Age; Females; Placenta Previa; Parity; Repeated Cesarean Section

Introduction

The term placenta previa refers to a placenta that is abnormally located in the lower part of the uterus, often covering the cervix [1]. Placenta previa complicates approximately in 200 deliveries and is one of the leading causes of vaginal bleeding in second and third trimester [2]. Various risk factors have been associated with placenta previa such as advanced maternal age, multiple gestation, high parity, or who smoke or use illegal drugs. The risk of placenta previa is also higher among women with previous cesarean section [3]. The overall annual incidence rate of caesarean delivery in the United States has been steadily rising in 1996, reaching 32.9% in 2009. If primary and secondary cesarean rates continue to rise as they have in recent years, by 2020 the cesarean delivery rates continue to rise as they have in recent years, by 2020 the cesarean delivery rate will be 56.2% [4]. Scar of the cesarean section may lead to the damage of the myometrium or endometrium which in turn may lead to increased incidence of placenta previa in subsequent section [5]. In a study conducted by Milosevic J et al., the incidence of placenta previa in the control group was 0.33%, opposite to the 1.86% incidence after one cesarean section (p<0.001), 5.49% after two cesarean section and as high as 14.28% after three cesarean section in obstetric history. Ashraf R, et al. [3] also reported a very high frequency (67%) of placenta previa observed among patients with previous cesarean section [6]. The work up for detection of placenta previa among

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the patients undergoing for repeat cesarean section is limited in our country. The result of two previous studies shows a great variation [3, 6]. We expect an increase in frequency as literature support it. This would encourage obstetricians and general public to understand and play role in reducing the number of unindicated cesarean sections which are being carried out in our country leading in turn to increasing incidence of placenta previa hence contributing in maternal morbidity and mortality.

Materials and Methods

A retrospective cohort study was performed over two hundred and forty (240) ladies between 2012-2016 visiting to antenatal care facility of Lahore General Hospital, Lahore fulfilling the inclusion criteria. The inclusion criteria were (i) Females (ii) 20-40 years of age (iii) Gestational age > 28 weeks after last menstrual period (iv) All the patients with subsequent pregnancy after previous cesarean section. Demographic history including age (in years) and parity were taken. Informed consent was obtained. All the patients had an obstetrical scan for the presence of placenta previa done in Radiology Department by a Radiologist (who have at least 5 years' experience of performing obstetrical scans). The women who were detected with placenta previa were further enquired for numbers of previous cesarean section. The data was collected on specifically designed proforma (attached). The study was approved by the Ethical Review Board of Lahore General Hospital, Lahore, Pakistan. All the collected data was entered into SPSS version 10 and analyzed. 't' test was applied. p value was≤0.05. The qualitative data like presence of placenta previa (yes or no) was presented as means and standard deviations. The data was also stratified for the effect modifier like age and number of caesarean of section and parity. Chi-square test was used post stratification with p-value ≤0.05 as significant.

Results

A total of 240 patients with a history of previous caesarean section performed once or more were reviewed over the period of 4 years (2012-2016). The mean age at the time of presentation was 30.41 ± 5.47 while mean gestation age was 34.50 ± 2.97. Placenta previa was found in 12.9 % (n=31) patients. Majority of patients (n=140, 58%) were having one caesarean section performed before they were diagnosed with placenta previa. Miscarriage was observed in 20 % (n=48) of patients. The mean parity was 2.15 ± 0.93 where 40% (n=98) of females had parity of 2 followed by 26% (n=64) and 25% (n=60) having parity of 1 and 3 respectively (Table 1). Age, previous miscarriage and parity has no association with placenta previa. On the other hand, with increasing number of caesarean sections, the risk of placenta previa increases significantly (p<0.001) (Table 2).

Table 1: The demographic and obstetric characteristics of patients with cesarean section history.

Variables Categories	Total = N (%)
Age (years)	
Mean ± SD*	30.41 ± 5.47
Gestational age (weeks)	
Mean ± SD*	34.50 ± 2.97
No of previously caesarean sections	
1	140 (58.3)
2	69 (28.7)
3	31 (12.9)
Placenta previa	
No	233 (87.1)
Yes	31 (12.9)
Previously miscarriage	
No	192 (80.0)
Yes	48 (20.0)
Parity	
Mean ± SD*	2.15 ± 0.93
1	64 (26.7)
2	98 (40.8)
3	60 (25.0)
4	15 (6.3)
5	3 (1.3)

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Table 2: Stratification of demographic and obstetric characteristics of patients with number of cesarean section history.

Variables Categories	No. of cesarean section Single	No. of cesarean section Previously two times	No. of cesarean section Previously three times	p-value
	140 (58.3)	69 (28.7)	31 (12.9)	
Age (years)				
Mean ± SD*	30.15 ± 5.64	30.67 ± 5.33	31.0 ± 5.10	0.7
Gestational age (weeks)				
Mean ± SD*	34.71 ± 2.84	34.16 ± 3.32	34.32 ± 2.98	0.43
Placenta previa				
No	135 (64.6)	60 (28.7)	14 (6.7)	0.001
Yes	5 (16.1)	9 (29.0)	17 (54.8)	
Previously miscarriage				
No	115 (59.9)	62 (32.3)	15 (7.8)	0.001
Yes	7 (14.6)	16 (33.3)	25 (52.1)	
Parity				
Mean ± SD*	1.65 ± 0.64	2.51 ± 0.63	3.58 ± 0.67	0.001

Discussion

Placenta previa can have serious adverse consequences for both mother and baby, including an increased risk of maternal and neonatal mortality [7, 8], fetal growth restriction and preterm delivery [9], antenatal and intrapartum hemorrhage [10-12], and women may require a blood transfusion or even an emergency hysterectomy [13]. Placenta previa poses a high risk for massive hemorrhage, from the antenatal period until after Cesarean section. This condition increases the risk of maternal and neonatal mortality and morbidity. In cases of placenta previa, the prenatal prediction of sudden bleeding during pregnancy and blood loss during Cesarean section, and the assessment of risk for adherence of the placenta using an ultrasound examination, can improve the perinatal outcome [14]. It is a relatively uncommon condition, with an overall incidence in England of 6.3 per 1000 births [5]. But local data was missing. So, we planned to conduct this study to find the local data. So, in the study 240 females were included with the mean age of 30.4 ± 5.47 years. The mean gestational age at the time of presentation was 34.50 ± 3.00weeks. In our cohort, there were 233 (87.01%) females who did not develop placenta previa while 31 (12.9%) females had placenta previa. With increasing number of caesarean sections, the incidence of previa increases significantly. The reported rate of previa was 4.4 per 1,000 births. The pregnancy after a cesarean delivery was associated with increased risk of previa (0.63%) compared with a vaginal delivery (0.38%, RR 1.5, 95% CI 1.3-1.8). Cesarean delivery in the first and second births conferred a two-fold increased risk of previa in the third pregnancy (RR 2.0, 95% CI 1.3-3.0) compared with first two vaginal deliveries [15].

In another study, a very high frequency of placenta previa was observed among patients with previous cesarean section. They observed that placenta previa was present among 67% patients with history of previous section [6]. In the previous meta-analysis of 21 studies, the pooled odds ratios of previous cesarean section as a risk factor for placenta previa was found to be 2.7 (95% CI: 2.3 to 3.2). The same study emphasized that the odds ratios were highly variable by setting, study design, sample size and quality. For well-designed studies, the pooled odds ratio was 1.9 (95% CI: 1.7 to 2.2) [16]. Among females who had history of previous cesarean section, it was reported that, placenta previa was present among 27% patients with history of previous one cesarean section, 61.5% patients with history of two cesarean section and 11.5% patients with history of three cesarean sections [6].In a study conducted by Milosevic J et al., the incidence of placenta previa was 1.86% after one cesarean section ($p<0.001$), 5.49% after two cesarean section and as high as 14.28% after three cesarean section in obstetric history [3]. In the largest population-based cohort study of over 11 million singleton deliveries between 1995 and 2000 in the USA, the adjusted odds ratio of the effect of previous cesarean section on placenta previa at second-birth was 1.5 [17].

Other population-based cohort studies published in the last decade reported adjusted odds ratios ranging from 1.4 to 1.7, using Missouri state birth certificates data, Washington state Birth Events data, South Australian Perinatal Data and Medical Birth Registry of Norway [13, 18-20]. A population-based study using data from the Swedish Birth Registry found a higher adjusted odds ratio of 1.8, but this study did not adequately control for risk factors [21]. There were 140(58.3%) females had previous 1 cesarean section, out of which 5 developed placenta previa. Among 69(28.8%) females had previous 2 cesarean section, out of which 9 developed placenta previa. Among 31(12.9%) females had previous 3 cesarean section, out of which 14 developed placenta previa. There was significant difference observed between number of previous cesarean section and frequency of placenta previa ($P>0.001$). In previous studies, the risk for placenta previa

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was 6.4%, 1.3%, 1.1%, 2.3%, 2.3% and 3.4% for first, second, third, fourth, fifth and sixth repeat cesarean deliveries, respectively [22]. A few studies have investigated whether the effect of a previous cesarean section on the risk of placenta previa was modified by other risk factors. The Missouri cohort study found that the effect of cesarean section was 70% higher for women with a second pregnancy within a year after the first delivery [15]. In younger females of age 20-25 years, 7 females had placenta previa, similarly, among females of age 25-30 years, 9 had placenta previa, 8 females of age range 30-35 years and 7 of age range 35-40 years had placenta previa. There was no significant difference observed between age of females and frequency of placenta previa (P>0.05). There were 6 females who had previa with parity 1, 5 had previa with parity 2, 7 had previa with parity 3, 6 had previa with parity 4 and 7 females had previa with parity 5. Similarly, there was no significant difference observed between parity and frequency of placenta previa (P>0.05).

Conclusion

The incidence of placenta previa is found to be high in local population who had multiple cesarean sections. We need large scale population-based studies to further strengthen our results.

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