

Original article:

A clinical study to assess and compare obstetrical and perinatal outcomes after previous cesarean versus vaginal delivery in second gravida women

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Abstract:

Background: "Once a cesarean always a cesarean" an old dictum is again gaining acceptance in modern obstetric practice. Delivery by cesarean section is associated with increased risk of maternal and perinatal morbidities. The present study was undertaken to estimate and compare the risk of maternal and perinatal morbidity and mortality in second gravida women who have undergone vaginal versus cesarean delivery in their first pregnancy. Secondary objectives were to assess subsequent subfertility and placental abnormalities after cesarean section.

Method: The cases were selected randomly during the study period and divided into two groups. Group 1 comprised of 100 women who were delivered by cesarean section at the time of their first pregnancy. Group 2 included another 100 women delivered by vaginal route previously.

Effect of previous cesarean section on obstetrical and perinatal outcomes following cesarean first birth were analyzed and compared with those following vaginal first birth. Incidence of placental abnormalities were analyzed and compared. Inter pregnancy intervals were recorded and compared for both the groups to assess the subfertility following cesarean section.

Result : Both the groups were comparable in terms of age distribution and residence (rural/urban). Average inter pregnancy interval for group 1 was 3.26 years while it was 3.05 years for group 2 cases. Incidence of placental abnormalities was significantly higher ($p=0.04$) in group 1 (10%) compared to group 2 (3%). Differences in incidence of other maternal complications were not significant. There was no significant difference in perinatal outcome in both the groups.

Conclusion: We observed increased risk of maternal complications and repeat cesarean section following previous cesarean section. About perinatal morbidity and mortality we observed no significant difference in both the groups.

Introduction

Cesarean delivery defines the birth of a fetus via laparotomy and then hysterotomy. cesarean section is by far the most common major surgical procedure in obstetrics with rates increasing dramatically worldwide¹⁻⁴. Delivery by cesarean section is associated with increased risk of maternal and perinatal

morbidities^{5,6}. Additionally, it has been associated with an increased risk of adverse obstetrical outcomes in the following pregnancy regardless of the delivery mode in next pregnancy⁷.

As a broad overview, cesarean delivery has higher maternal surgical risks for the current and subsequent pregnancies. This is balanced

against lower rates of perineal injury and short-term pelvic floor disorders^{8,9}. For the neonate, cesarean delivery offers lower rates of birth trauma and stillbirth. Conversely, rates of initial respiratory difficulties are greater with cesarean delivery. At population level, compared with vaginal delivery in first pregnancy, first birth cesarean delivery has been found to be associated with significantly increased rate of infection, hemorrhage, and thromboembolism¹⁰, uterine rupture, placenta praevia and placental abruption, placenta praevia leading to peripartum hysterectomy, stillbirth and perinatal death.

Cesarean delivery is associated with lesser risk of fetal trauma. And this in many instances influences the choice of cesarean delivery despite the associated maternal risks. Although physical injury risks are lower, cesarean delivery per se may have no bearing on the neurodevelopmental prognosis (rates of either cerebral palsy or seizures) of the infant^{11,12}. In second gravida women cesarean delivery is not only attributed to previous cesarean delivery but other fetomaternal conditions may also be responsible for it which may also lead to cesarean section in second gravida women who have undergone vaginal delivery in their first pregnancy. These conditions include dystocia, fetal distress, abnormal presentation, failure of forceps or vacuum etc. The primary objective of the study was to estimate and compare the risk of maternal and perinatal morbidity and mortality in second gravida women who have undergone vaginal versus cesarean delivery in their first pregnancy. Secondary objectives were to assess subsequent subfertility and placental abnormalities after cesarean section.

Materials and methods:

This prospective observational study was conducted in the department of Obstetrics and Gynecology, P.B.M and Associated Group of Hospitals (tertiary care hospital), attached to Sardar Patel Medical College, Bikaner during study period of one year from January 2014 to December 2014 after the approval of the hospital's ethical committee. Informed consent was obtained from each women recruited into the study. All cases were managed according to the departmental protocol and were followed up clinically until they were discharged.

Inclusion criteria's:

1. All pregnant women with previous one birth.
2. Singleton pregnancy.
3. Gestational age between 28 and 40 weeks.
4. Birth weight of >1100 g.

Exclusion criteria's:

1. Nulliparous women.
2. Multiple pregnancies.
3. More than one previous birth.
4. Congenitally malformed baby.
5. Previous uterine surgery, MTP or evacuation.
6. Patients with evidence of severe systemic illness e.g. diabetes, congenital heart disease etc.

For comparative analysis, the study population was divided into two groups according to mode of delivery for first birth.

Group I (case): Pregnant women with cesarean first birth (n=100).

Group II (control): Pregnant women with vaginal first birth (n=100).

Outcome measures for mother and neonates following cesarean first birth were

compared with those following vaginal first birth.

Information obtained on demographic, medical, reproductive history including maternal age, ethnicity, obstetric history, Interpregnancy interval (defined as the time passed since the termination of the previous pregnancy and the conception of the next pregnancy), any complication occurring during pregnancy, duration of labor and mode of delivery at time of first birth, perinatal outcomes, educational qualification and type of occupation of patients and their spouses and their family income. Socioeconomic status was computed using the methods reported by modified Kuppuswamy scale. This classification was based on education and occupation of the head of the family and total family income.

Maternal and fetal complications were observed and recorded.

Statistical Analysis: The data was subjected to statistical analysis by using SPSS software. Student 't' test was applied for all quantitative parameters. The means were compared for their statistical difference using p values. The frequency data was subjected to χ^2 test and p values calculated using SPSS software version 10.0.

Observations:

Both groups were comparable in terms of demographic parameters like age, residence (rural/urban), socioeconomic status. Use of contraceptives and interpregnancy interval were recorded which was slightly higher in group 1 but was statistically insignificant. In group 1 87% of cases were delivered by

cesarean section with VBAC rate 13% in our study. Incidence of cesarean section in control group (group 2) was 29%. Most common indication for elective cesarean section in group 1 was refusal for VBAC (74.66%) and in group 2 was malpresentations (80%). For emergency cesarean section fetal distress was most common indication (58% and 42% in group 1 and 2 respectively). APH was second most common indication (25% and 10.5% in group 1 and 2 respectively).

In our study we observed increased incidence of placental abnormalities in group 1 (study group). Most common placental abnormality in group 1 was low lying placenta (7%). Other abnormalities were abruption placentae (3%) and morbidly adherent placenta (3%). In group 2 (control group) low lying placenta was present in 3% cases and abruption placentae in 1% cases only (Table 4).

The overall incidence of placental abnormalities was 10% in group 1 compared to 3% in group 2 which was statistically significant ($p=0.04$). This clearly indicates that there is higher incidence of placental abnormalities after previous cesarean section in comparison to previous vaginal delivery.

Overall we observed increased incidence of placental abnormalities, PPH, preterm labor, peripartum hysterectomy, uterine rupture and requirement of blood transfusion in our study group (group 1) in comparison to control group (group 2), though statistically insignificant except placental abnormalities. The difference in incidence of neonatal complications was not statistically significant in our study.

Table 1: Distribution of cases according to inter-pregnancy interval

Inter Pregnancy Interval (Years)	Group 1	Group 2
Mean	3.26	2.78
SD	1.48	1.35
T	1.818	
P	0.071	

Table 2: Distribution of cases according to Mode of Delivery

Mode of Delivery	Group 1		Group 2		χ^2/p
	No. of cases	%	No. of cases	%	
Elective LSCS	75	75	10	10	86.450/<0.001
Emergency LSCS	12	12	19	19	1.870/>0.05
Vaginal	11	11	65	65	61.884/<0.001
Forceps	2	2	0	0	2.020/>0.05
Assisted Breech	0	0	6	6	6.186/<0.05
Total	100	100	100	100	

Table 3: Distribution of cases according to Maternal Complications

Complications	Group 1		Group 2		χ^2/P
	No. of cases	%	No. of cases	%	
Preterm Labor	6	6	4	4	0.421/ 0.516
PIH	5	5	6	6	0.096/ 0.756
Malpresentation	10	10	15	15	1.14/ 0.28
APH	3	3	3	3	-
Placental Abnormality	10	10	3	3	4.03/ 0.04
Blood Transfusion	10	10	6	6	1.08/ 0.29
PPH	7	7	4	4	0.86/ 0.35
Hysterectomy	2	2	1	1	0.338/ 0.561
Uterine rupture	2	2	1	1	0.338/ 0.561
Bladder Injury	1	1	0	0	1.005/ 0.316
Wound Infection	3	3	2	2	0.205/ 0.65

Table 4: Distribution of cases according to type of Placental Abnormalities

Type of Placental Abnormalities	Group 1		Group 2		χ^2/ p
	No. of cases	%	No. of cases	%	
Low Lying Placenta	7	7	2	2	2.90/ 0.08
Abruption Placentae	3	3	1	1	1.02/ 0.31
Morbidly Adherent Placenta	3	3	0	0	3.04/ 0.08

Table 5: Distribution of cases according to Perinatal Complications

Perinatal Complications	Group 1		Group 2		X^2/ P
	No. of cases	%	No. of cases	%	
Birth Asphyxia	5	5	9	9	1.22/0.26
NICU Admission	18	18	15	15	0.326/0.56
IUGR	1	1	1	1	-
Iatrogenic Prematurity	2	2	1	1	0.338/0.561
Sepsis	0	0	1	1	1.005/ 0.31
Still Birth/ Neonatal Death	3	3	3	3	-
IUD	2	2	3	3	0.205/0.65

Discussion

Cesarean section is the most commonly performed surgery in obstetrics. The rising trend of cesarean section is emerging as a major cause of concern for the healthcare system all over the world. The opinion that cesarean section is a better, safer, and less painful way to give birth and the subsequent demand for CS without a medical indication are relatively new. The rate of CS has increased dramatically during the last three decades, in some countries to almost one third of all deliveries.

Incidence of cesarean section has been increased because advances in our knowledge and technique have made it possible for us to detect antepartum and intrapartum complications earlier. Increasing fear of law suits compel the obstetrician to take a quicker recourse of abdominal delivery.

Improved anesthesia, availability of effective antibiotics, blood transfusion facilities and improved surgical techniques, all have made cesarean section safer than instrumental deliveries. Obstetricians today are getting more and more deliveries with previous scar. The factors to be weighed are the risk to mother of repeat cesarean section and risk to the child of rupture of the scar if vaginal delivery is allowed.

In our present study we tried to analyze the effect of previous cesarean section on current pregnancy and tried to find out the outcome of pregnancy after previous cesarean. In our study most of the patients were from younger age group from 21-25 years and consisted of both registered and unregistered cases as our hospital is a referral center with a large number of patients being referred from sub-centers and primary health centers. 77% of

cases of group 1 in our study were registered in ANC clinic as compared to 54% cases in group 2. Higher rate of registration for ANC among the group 1 cases indicates increased awareness in mothers for ante natal checkup after having previous cesarean delivery. The difference was statistically significant ($p < 0.001$).

In our study we observed distribution of cases according to their socioeconomic status as per Kuppaswamy Scale. In group 1, 72% cases were from middle class while in group 2, 51% cases belonged to the middle class. This shows that incidence of cesarean delivery in first pregnancy was higher in middle class.

In our study average inter pregnancy interval (Table 1) for group 1 was 3.26 ± 1.48 years which was slightly higher than group 2 (2.78 ± 1.35 years). Hence inter pregnancy interval was higher in mothers previously delivered by cesarean section. The difference between inter pregnancy interval was not statistically significant ($p = 0.071$).

This outcome is consistent with a meta-analysis of studies¹³ in which they found that previous cesarean delivery is associated with an increase in subsequent sub-fertility (i.e. a delay in time to next pregnancy or birth) compared to vaginal delivery by as much as 14%. A study¹⁴ observed 22 months inter pregnancy interval after first delivery by cesarean section compared to 16 month after first delivery by vaginal route. In another study¹⁵, they observed that there is no evidence that women delivering by cesarean section have significantly longer waiting times to next pregnancy or birth.

We observed in our study that 87% of cases in group 1 were delivered by cesarean

section out of which 75% were elective and 12% were emergency cesarean section. Incidence of vaginal birth after cesarean (VBAC) was only 13% in our study (Table 2). It is comparable with the recent statistics¹⁶ from the U.S. National Center for Health Statistics, which suggests that, after reaching a maximum of 28.3% in 1996, the VBAC rate has declined precipitously since, and was only 12.7% in 2002.

In our study most common indication for elective cesarean section in group 1 (previous cesarean) was refusal for VBAC (74.66%). Other less common indications were placenta praevia (8%), malpresentations (8%), CPD (4%), contracted pelvis and PIH (2.66% each). The proportion of women who attempt vaginal delivery after prior cesarean delivery has decreased largely because of concern about safety.

In our control group (group 2), only 10% of total cases were consisted of elective cesarean section out of which most common indication was malpresentation (80%). Other indications were placenta praevia and PIH (20% each).

We observed increased incidence of placental abnormalities, PPH, preterm labor, peripartum hysterectomy, uterine rupture and requirement of blood transfusion in our study group (group 1) in comparison to control group (group 2), though statistically insignificant except placental abnormalities. The difference which was statistically significant was incidence of placental abnormalities only ($p = 0.04$).

Our observations are comparable with a study¹⁷ which found that compared with mothers who had primary vaginal births, mothers who had primary cesarean section and

underwent labor in the second birth were at increased risk of uterine rupture, peripartum hysterectomy, postpartum hemorrhage (PPH) following vaginal delivery, manual removal of placenta, infection and intensive care unit (ICU) admission.

Another study¹⁸ observed increased risks for malpresentation, placenta praevia, antepartum hemorrhage, placenta accreta, prolonged labor, emergency cesarean and uterine rupture. In our study we observed increased incidence of placental abnormalities in group 1 (study group). Most common placental abnormality in group 1 was low lying placenta (7%). Other abnormalities were abruption placentae (3%) and morbidly adherent placenta (3%). In group 2 (control group) low lying placenta was present in 3% cases and abruption placentae in 1% cases only.

The overall incidence of placental abnormalities was 10% in group 1 compared to 3% in group 2 which was statistically significant ($p=0.04$). This clearly indicates that there is higher incidence of placental abnormalities after previous cesarean section in comparison to previous vaginal delivery. Our findings are consistent with other studies done in past^{18,19,20,21,22}. A study²³ found no difference in incidence of placenta praevia between the two groups while other complications like uterine rupture, placental abruption, preeclampsia, and spontaneous preterm delivery were more likely with previous cesarean section.

The difference in incidence of neonatal complications was not statistically significant. This is comparable to the study²³ in which there were no significant differences found in the risk of perinatal outcomes (i.e. low birth weight, intrauterine death, or five-

minute Apgar score <7). In contrast to our findings one study¹⁸ found that cesarean delivery is associated with increased risks for adverse perinatal outcomes in the subsequent birth.

To conclude the discussion about obstetric outcomes we observed increased risk of maternal complications and repeat cesarean section following previous cesarean section. About perinatal morbidity and mortality we observed in our study no significant difference in both the groups regarding perinatal outcome.

Conclusion

“Once a cesarean always a cesarean” an old dictum is again gaining acceptance in modern obstetric practice. Assessment and comparison of obstetrical and perinatal outcomes after cesarean versus vaginal delivery in second gravida women was done. Also impact of previous cesarean on fertility (inter pregnancy interval) and incidence of placental abnormalities was studied and following conclusions were drawn:

1. There is very high incidence of repeat cesarean section after first birth by cesarean section.
2. All the patients should be encouraged for ANC checkup and hospital delivery.
3. Incidence of placental abnormalities is higher in cases with previous cesarean section as compared to previous vaginal.
4. There is slight increase in inter pregnancy interval following previous cesarean section.
5. There was higher incidence of cesarean section in middle class as

compared to lower class according to Kuppuswamy scale. Also the group 1 cases which mostly belonged to middle class had better access to ANC care and use of contraceptives when compared to group 2 which had almost equal proportion of lower and middle class.

Hence previous section pregnancy should be considered as high risk pregnancy so, efforts should be made to minimize the complications by:

- Proper ANC checkup to improve nutritional status and hemoglobin levels and for early detection of any placental abnormality.
- Patients should be encouraged for compulsory hospital delivery to minimize maternal and perinatal complications like rupture of uterus and IUD, peripartum hysterectomy, PPH and need for blood transfusion.
- Patient who have undergone a cesarean section should also be counseled for use of suitable contraceptive methods to increase inter pregnancy interval.

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