

Outcome of Subsequent Pregnancy in Women with Previous Caesarean Delivery: A Retrospective Study

Yadav P^{*1}, Basnet T¹, Sha M¹, Yadav SP²

¹Department of Obstetrics and Gynecology, BPKIHS, Nepal. ²Department of Pediatrics, BPKIHS, Nepal. *Corresponding Author's Email: dryadavpunita@gmail.com

ABSTRACT

Introduction: Previous caesarean section poses risk to both mother and neonates in the subsequent pregnancy. This study aimed to study the obstetric and neonatal outcome in a pregnancy with previous caesarean section (CS). **Methods:** A retrospective chart review was conducted in pregnant women with previous CS, admitted from 15th October 2020 to 14th April 2021. Collected data were analyzed regarding maternal and perinatal outcome using appropriate statistics. **Results:** Among total of 322 cases, vaginal birth after caesarean were conducted in 3.7% and majority 78.2% went through emergency CS, rest were elective. Total CS was done in 96.2%, because 58.7% did not meet VBAC criteria and 40.3% refused VBAC. 36.6% had preterm delivery. Of 310 cases that underwent CS, common complications reported were: intra operative hemorrhage (20), scar dehiscence (12), urinary bladder injury (4), placenta praevia (11), uterine rupture (2), adherent placenta (5), postpartum hemorrhage (PPH) (13), abruptio placentae (6) and hysterectomy (1). 3 mothers required ICU admissions. Complications among neonates were: low birth weight 14.2%, birth asphyxia 3.1%, 5.2% required NICU admissions. (8/322) pregnancy had intra uterine fetal death and there was 1 still birth. Perinatal mortality were higher among female with previous LSCS less than 2 years ($p=0.02$) and those with more than once LSCS had significant proportion of intraoperative haemorrhage ($p=0.01$), PPH ($p=0.04$) and placenta praevia ($p=0.04$). **Conclusions:** Delivery among pregnant with previous CS have significant operative challenges and perioperative complications among mother and neonates. Anticipation of common complications and preparedness beforehand could improve both maternal and neonatal outcome.

Key words: Maternal, neonatal, outcome, previous caesarean delivery.

INTRODUCTION

Cesarean section (CS) is one of the essential comprehensive obstetric services. It can be a life-saving for the fetus, the mother or for both in certain situation like obstructed labor, fetal distress, obstetric hemorrhage (1). 60% of maternal mortality among pregnant women in low-income countries could be prevented if CS was performed at a population level of 10-15% (2).

CS is one of the commonly performed major surgical procedures in obstetrics. It not only predisposes pregnant women to short term adverse events like higher rate of hemorrhage, blood transfusion, infection, prolonged hospital stays, there is also increase risk of long-term complication too.

Risk of placenta previa, morbidly adherent placenta, and uterine rupture increases in subsequent pregnancy. Along with maternal adverse effect, there is also increase neonatal morbidity like risk of respiratory depression, respiratory infection, and intensive care admission is also increased. The risk of adverse outcomes after CS increases as the number of CS increase (3). However, the frequency of these complications in the hospital setting of a resource limited country like, Nepal has been lacking. Therefore, this study was conducted to see the effect of previous CS on the obstetric and neonatal outcome in subsequent pregnancy.

This is an Open Access article distributed under the terms of the Creative Commons Attribution CC BY license (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted reuse, distribution, and reproduction in any medium, provided the original work is properly cited.

(Received 04th April 2022; Accepted 26th April 2022; Published 30th April 2022)

METHODS

A retrospective study was done at Department of obstetrics and Gynaecology of B. P. Koirala Institute of Health Sciences, Dharan, a tertiary care center in eastern part of Nepal. A total of 322 pregnancies over a 6 months period from 15th October 2020 to 14th April 2020 were enrolled. Pregnant women with history of previous caesarean delivery, admitted after 28 weeks of gestation in obstetrics emergency or in antenatal ward were included in the study. Pregnancy with medical disease like hypertension, diabetes, heart disease or other chronic illness in mother and presence of any congenital anomalies in fetus were excluded. Similarly, mother who had underwent any uterine surgery other than caesarean section were also excluded. The outcome variable measured were mode of delivery, Post Partum Haemorrhage (PPH) with need for blood transfusion, occurrence of scar dehiscence (complete, partial), visceral injury, uterine rupture, adherent placenta, placenta previa, hysterectomy, admission to intensive care unit, maternal death and difficulty encountered during repeat CS. In addition fetal outcome like gestational maturity, need of resuscitation, Apgar score, need of neonatal admission and perinatal death were also recorded. The study was approved by institute research committee (IRC 2071/020). All relevant data were entered in excel and analyzed using SPSS 21 version. Descriptive statistics like frequency, percentage, mean, standard deviation, etc, was used for summarizing the findings. Similarly, proportions were compared using

chi-square test and p value <0.05, was taken significant.

RESULTS

Total of 322 cases were enrolled in the study which comprised of pregnancy admitted in department with previous LSCS over 6 months period. Majority of the age group was 20-29 yrs. (57.7%), followed by 30-39 years (39.1%), 10 cases were above 40 years. The mean (SD) age was 29(±4.7) years. 51.8% were booked cases, hence significant proportion of cases were referred to the unit for the first time for delivery. 66.4% were second gravida and 25.1% were gravida three, there were also 4 cases of gravida 4 and 1 case of gravida 5. Only 45.6% of the cases had adequate Antenatal Checkups (ANC) visits. Majority of the cases 93.1% had only one previous CS, while there were also cases with previous two LSCS (20 cases) and 2 cases with 3 previous LSCS. Time since last CS were mostly more than >5yrs (47.2%), 39.4% had last CS between two to five years and 13.3% had previous LSCS within 2 years.

Vaginal birth after caesarean (VBAC) was conducted in 3.7% and majority 78.2% went through emergency CS, while significantly less proportion underwent elective CS (18.1%). Total CS was done in 96.2%, because 58.7% did not meet VBAC criteria and 40.3% refused VBAC. 310 cases underwent CS, the common complications and challenges recorded among these cases were presented in Table 1.

Table 1: Maternal complications and surgical difficulties among cases undergoing CS (N=310)

Parameters	Frequency	Percentage
Intraoperative Haemorrhage	20	6.4%
Scar Dehiscence	12	3.8%
Bladder injury	4	1.2%
Uterine rupture	2	0.6%
Adherent Placenta	5	1.6%

Hysterectomy	1	0.3%
Difficult opening abdomen	126	40.6%
Difficult separating bladder	37	11.9%
Difficult visualizing tubes and ovaries	57	18.3%
PPH*	13	4.1%
ICU admissions	3	0.9%
Prolonged catheterization	9	2.9%
Surgical site infections	2	0.6%

*PPH: Postpartum haemorrhage

Antepartum haemorrhage due to abruptio placentae were recorded in 6 cases (1.9%), Placentae Praevia was observed in 11(3.5%) cases (low lying - 7, partially covering OS - 2 and completely covering OS - 2). Among 12 cases that underwent VBAC; 2 cases

(12%) had IUFD, 1 case (8.3%) had still birth, there were 7 (58.3%) preterm deliveries and 1 neonate (8.3%) required ICU admission. The summary of the status of fetus and newborn is presented in Table 2.

Table 2: Complications among fetus and neonates (N=322)

Parameters	Frequency	Percentage
Preterm delivery	118	36.6%
LBW*	46	14.2%
Birth Asphyxia	10	3.1%
NICU admission	17	5.2%
Still Birth	1	0.3%
IUFD*	8	2.4%

*LBW: Low birth weight (<2.5kgs), IUFD: Intrauterine fetal death

Gestational age at birth of neonates, <=32 weeks (5 cases), 32-36 weeks (113 cases), 37-41 weeks (203), >=42 weeks (1 case). Similarly birth weights were 1-1.4 Kgs (5 cases), 1.5-2.4 Kgs (41 cases), 2.5-3.9 Kgs (263) and >=4 Kgs (13 cases). Significant proportion of mother with last LSCS before 2 years had adverse perinatal outcome (p=0.02), similarly

those who had more than one previous LSCS had higher rates of intraoperative haemorrhage (p=0.01), PPH (p=0.04) and placenta praevia. Other parameters though not significant were mostly favorable in women with previous single LSCS and had their last caesarean more than 2 years. (Table:3 and Table:4).

Table 3: Association of maternal and neonatal outcome with duration of previous LSCS (<2 yrs vs. ≥ 2yrs), (N=310)

S.No.	Parameters	< 2yrs (%)	≥ 2yrs (%)	p-value
1	Scar dehiscence	5.4	2.1	0.1
2	Intraop haemorrhage	6	6.9	0.7
3	Visceral injury	1.2	1.4	0.8
4	Uterine Rupture	1.2	0	0.1
5	Adherent Placenta	0.6	2.7	0.1
6	Perinatal mortality	3.6	0	0.02
7	NICU admissions	4.2	5.5	0.6

Table 4: Association of maternal and neonatal outcome with number of previous LSCS (1 vs. ≥ 2), (N=310)

S.No.	Parameters	One prev. LSCS (%)	≥ 2 prev. LSCS (%)	p-value
1	Scar dehiscence	3.4	4.8	0.5
2	Intraop haemorrhage	3.9	11.4	0.01
3	Visceral injury	1.0	1.9	0.4
4	Uterine Rupture	1	0	0.3
5	Adherent Placenta	1.4	1.9	0.7
6	Placenta Praevia	2.4	5.7	0.04
7	PPH	1.4	6.7	0.04
8	Perinatal Death	1.4	2.9	0.3
9	NICU admission	3.4	7.6	0.09

DISCUSSIONS

Conducting delivery in pregnant cases with previous history of LSCS poses many challenges. There are chances of preterm delivery, intraoperative challenges like opening of abdomen due to adhesions, separating bladder and identifying tubes and ovaries are present. Similarly, there are increased

risks of blood loss due to APH or PPH; there are also chances of rupture of uterus if VBAC is conducted. Risk of surgical site infections and bladder injury are also present. All these maternal complications were present in varying proportion in our study. Among neonates more than one third of the cases had preterm delivery and about one fourth of them

were low birth weight. Few cases of IUFD and still birth were also seen in this study. The rate of repeat CS among previous CS in current study was 96.1%, this was quite high because 58.1% of the cases did not meet the criteria for VBAC, and 40.3% refused VBAC. The rate of repeat CS in developed nations is mostly below 80% (4).

In this study 4.1% of the cases had PPH, 1 case (0.3%) required hysterectomy, and bladder injury happened in 4 cases (1.2%), while in similar study by Bhowmik et al. The proportion of PPH was 6.66%, followed by wound extension 3.33%, 3 cases had hysterectomy and bowel and bladder injury occurred in 2 cases each (1.1%) (5). These proportions of complications are similar to our study. In a study from Norway adverse outcome in second pregnancy with previous caesarean sections were excessive bleeding 27.5%, placenta praevia 2.2%, placenta accreta 0.3%, placenta abruptio 4.8%, uterine rupture 0.06% (6). In our study the proportion of excessive bleeding was seen in 12.1%, abruptio placentae 1.8%, placenta praevia 3.4%, placenta accrete 1.6% and uterine rupture 0.6%.

In a retrospective cohort about 60% of women with previous caesarean reached term gestation, this proportion was similar to our study (63%). Uterine rupture was 0.13%, perinatal mortality was 0.3% compared to 2.7% and neonatal ICU admission 3.8% compared to 5.2% in our study. The increase perinatal mortality in our scenario could be because of poor ante natal checkup and delayed referral (7).

In another study from Peru, the perinatal outcomes among pregnancy following previous caesarean delivery were uterine rupture (0.7%), abruptio placentae (0.6%), placenta praevia (1%), low birth weight (6.2%), IUFD (0.4%), Birth Asphyxia (0.4%) (8). There are other studies which have reported similar trends in uterine rupture and abruptio placentae in similar clinical scenario (9-11). Majority of these parameters were higher in the current study with LBW in 14.2% and Birth Asphyxia in 3.1%. The relative adverse perinatal outcome could be because about half of the enrolled cases were unbooked.

Alike our study a study from China reported that the subsequent CS in women with previous CS was high 97.3%. In addition other issues were:

APH (1.1%), PPH (2%), Placenta praevia (2.3%), abruptio placenta (0.1%), rupture uterus (0.1%), puerperal infection (0.3%), Still births 0.2%, preterm delivery 5.5%, LBW 2.6%, Birth asphyxia 1.4%, neonatal ICU admissions 5.9% and neonatal death 0.1%. The maternal and perinatal outcome was almost comparable to our study (12). In our study maternal and neonatal complications increased with increase in number of LSCS and short interval time between next pregnancy from the previous LSCS, in similar studies, the frequency of bowel and bladder injury was about 0.1% with up to three previous cesarean sections and under 1% thereafter. Uterine rupture <1% up to two cesarean sections, but increases thereafter to about 4%. Blood transfusions were common and required in up to 5%. Hysterectomy and placenta accreta was less than 1% for up to three cesarean sections but 2.5–3% in more than four. Severe adhesions were common in more than one cesarean section (13, 14).

CONCLUSIONS

Pregnancies following previous CS mostly undergo a repeat CS. Adverse obstetrics outcomes are common in these scenario. Similarly, there are increased frequency of preterm, LBW delivery and untoward neonatal outcome. The findings of the study could be used in counseling to the family members as well preparedness to efficiently handle the anticipated complications. It is also advisable not to have more than two LSCS and also to place the subsequent pregnancy after 2 years of previous LSCS.

ACKNOWLEDGEMENT

Nil.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interests regarding the study or this article.

REFERENCES

1. Kietpeerakool C, Lumbiganon P, Laopaiboon M, Ratanakanokchai S, Vogel JP, Gülmezoglu AM. Pregnancy outcomes of women with previous caesarean sections: Secondary analysis of World Health Organization Multicountry Survey on Maternal and Newborn Health. *Sci Rep*. 2019 Jul 5;9(1):9748.

2. Thomas S, Meadows J, Mc Queen KA. Access to cesarean section will reduce maternal mortality in low income countries: A mathematical Model. *World J Surg.* 40; 1537-41.
3. Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Labour induction. *Williams obstetrics* 2010. 24th. McGraw Hill 2014. Chapter 30.587-90.
4. Brennan DJ, Robson MS, Murphy M, O'Herlihy C. Comparative analysis of international cesarean delivery rates using 10-group classification identifies significant variation in spontaneous labor. *Am J Obstet Gynecol.* 2009;201(3):308.
5. Bhowmik J, Kyal A, Das I, Berwal V, Das PK, Mukhophadhya P. Pregnancy with previous caesarean section: an overview of adverse fetomaternal sequelae. *Int J Reprod Contracept Obstet gynecol.* 2018 May;7(5):1817-21.
6. Daltveit AK, Tollanes MC, Pihlstrøm H, Irgens LM,. *Obstetrics and Gynecology.* June 2008; 11(6); 1327-34.
7. Stock SJ, Ferguson E, Duffy A, Ford I, Chalmers J, Norman JE. Outcomes of induction of labour in women with previous caesarean delivery: a retrospective cohort study using a population database. *PLoS One.* 2013;8(4):e60404.
8. Ventura Laveriano WR, Redondo CE. Obstetric outcomes in the second birth of women with a previous caesarean delivery: a retrospective cohort study from Peru. *Rev Bras Ginecol Obstet.* 2013 Apr;35(4):148-52.
9. Dandolu V, Graul AB, Lyons A, Matteo D. Obstetrical hysterectomy, cesarean delivery and abnormal placenta. *J Matern Fetal Med.* 2012;25(1):74-7.
10. Kaczmarczyk M, Sparén P, Terry P, Cnattingius S. Risk factors for uterine rupture and neonatal consequences of uterine rupture: a population-based study of successive pregnancies in Sweden. *BJOG.* 2007;114(10):1208-14.
11. Yang Q, Wen SW, Oppenheimer L, Chen XK, Black D, Gao J, Walker MC. Association of caesarean delivery for first birth with placenta praevia and placental abruption in second pregnancy. *BJOG.* 2007 May;114(5):609-13.
12. Hu HT, Xu JJ, Lin J, Li C, Wu YT, Sheng JZ, Liu XM, Huang HF. Association between first caesarean delivery and adverse outcomes in subsequent pregnancy: a retrospective cohort study. *BMC Pregnancy Childbirth.* 2018 Jun 28;18(1):273.
13. Marshall NE, Fu R, Guise JM. Impact of multiple cesarean deliveries on maternal morbidity: A systematic review. *American Journal of Obstetrics and Gynecology.* 2011;205(3):262.
14. Zwergel C, Kaisenberg CSV. Maternal and Fetal Risks in Higher Multiple Cesarean Deliveries. In: Schmölzer, G., editor. *Recent Advances in Cesarean Delivery* [Internet]. London: IntechOpen; 2019. Available from: <https://www.intechopen.com/chapters/67257> doi: 10.5772/intechopen.86334.