

Maternal and Neonatal Complications in Second Stage Cesarean Section, A Prospective Observational Study

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Abstract

Background: Caesarean deliveries done in the second stage of labor account for one-fourth of all primary caesarean sections. These are more frequent in developing countries. Caesarean sections done at full cervical dilatation with impacted fetal heads are technically difficult and are associated with higher complications. **Methods:** 201 patients who underwent cesarean section in the second stage were enrolled in this study. Cesarean was performed under spinal anesthesia unless contraindicated. Post procedure, patients were closely monitored. **Results:** The two most common indications for second-stage cesarean section were dystocia (68%) and fetal distress (28%). A trial of instrumental delivery was given in 41% of these deliveries. The mean age of the patients undergoing cesarean section in the second stage was 27.6 years. Primigravida comprised 72.1% (145) and 27.8% (56) were multigravida. Maternal morbidity outcomes included PPH, need for blood transfusion, lower segment tear, wound infection, puerperal febrile morbidity, bladder injury, hysterectomy, maternal death. The most common fetal complication seen in our study was meconium-stained amniotic fluid in 21.2% of cases. Neonatal Intensive Care Unit admission rate in our study was 10.9%. **Conclusion:** Second stage cesarean section is challenging not only for the obstetricians but also the patient as it is technically difficult to perform and associated with increased maternal and neonatal morbidity. However, the complications can be reduced if these deliveries are attended by consultants and strengthening the referral system in our setup.

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INTRODUCTION

Caesarean section rates vary widely across the globe, ranging from as low as 1% in parts of Sub-Saharan Africa to 30% in the USA and 45% in Brazil [1]. Following debate over the most appropriate rates of caesarean sections at national and regional levels, the WHO issued a statement in 2015 recommending that every effort should be made to provide caesarean sections to women *in need*, rather than striving to achieve specific population-level rates [2]. In line with global trends, the CS rate in India has increased from 8.5% in 2005–06 to 17.2% in 2015–16 [3].

Caesarean deliveries done in the second stage of labor account for one-fourth of all primary caesarean sections. The incidence of second-stage caesarean sections is more in developing countries, where babies are delivered at home by traditional birth attendants and where the mothers report to the hospital late in labor, when the traditional birth attendants fail in their endeavors. Caesarean sections done at full cervical dilatation with impacted fetal heads are technically difficult and they are associated with an increased incidence of maternal and fetal morbidities.

Extraction of the impacted fetal head may be done by the 'push method,' i.e., pushing through the vagina, or by the 'pull method', i.e., a reverse breech technique. Numerous studies [4,5] have compared both these methods. However, both these methods are associated with an increased rate of maternal morbidity in the form of uterine extensions, postpartum hemorrhage, and fever [6,7]. Patwardhan technique is a unique technique that is used for delivering babies in second-stage caesarean sections [8,9].

OBJECTIVE: To determine the maternal and fetal complications in second-stage cesarean section in a tertiary center.

MATERIALS AND METHODS

This is a prospective observational study conducted in Government Medical College, Baramulla, a tertiary care hospital from December 2019 to March 2021. 201 patients who underwent cesarean section in the second stage were enrolled in this study after proper consent and clearance from the ethical committee as per criteria Table 1. The second stage of labor is defined as the time period from full cervical dilatation to delivery. The cesarean sections were performed under spinal anesthesia unless contraindicated in which case general anesthesia was used. The surgeries were performed either by or in presence of a consultant. Post-procedure, patients and babies were closely monitored, especially for the first 24 hours.

Table 1. Inclusion and exclusion criteria:
Inclusion Criteria
Singleton pregnancy with gestational age of >37 weeks Cephalic presentation With or without previous LSCS In the second stage of labor
Exclusion criteria:
Multiple pregnancy Preterm deliveries Babies with congenital anomalies Malpresentations Medical complications associated with pregnancy.

RESULTS

During this study period, there were 16,104 deliveries, 10,017 (62.2%) delivered vaginally, and 6087 by cesarean section with a cesarean delivery rate of 37.8%. Out of the total cesarean sections 3096 (50.8%) were elective and 2991 (49.13%) were emergency cesarean sections. 206 (6.7%) pregnancies satisfied the inclusion and exclusion criteria of the study, these were pregnancies where cesarean section was performed in the second stage of labor. Assisted vaginal deliveries had been attempted in 6.58% of pregnancies, forceps were used in 1.78% of deliveries, and vacuum in the remaining 4.8%. The two most common indications for second-stage cesarean section were dystocia (68%) and fetal distress (28%). A trial of instrumental delivery was given in 41% of these deliveries.

The mean age of the patients undergoing cesarean section in the second stage was 27.6 years. Primigravida comprised 72.1% (145) and 27.8% (56) were multigravida Table 2.

Mean maternal age (years)	27.6
Mean maternal weight (kg)	78
Mean gestational age at delivery (weeks)	39.2
Mean birth weight (gm)	3420

There is an increased risk of complications in second-stage cesarean section. Table 3 illustrates maternal complications. Maternal

morbidity outcomes included PPH, need for blood transfusion, lower segment tear, wound infection, puerperal febrile morbidity, bladder injury, hysterectomy, maternal death.

MATERNAL COMPLICATIONS	NUMBER	PERCENTAGE
Atonic PPH	32	15.9%
Lower segment tears, extension of uterine incisions	12	6.2%
wound infection	22	11%
Puerperal febrile morbidity	25	12.3%
Need for blood transfusion	15	7.4%
Hysterectomy	3	1.4%
Maternal death	1	0.49%
Bladder injury	4	1.9%

Among the 201 babies born 108 were females and 93 were males. The mean birth weight was 3420gm. Neonatal complications increase in second-stage deliveries. These have been illustrated in table 4.

Neonatal complications	Number	Percentage
Apgar score <3 at 5 minutes	2	1%
Meconium stained amniotic fluid	64	21.2%
Neonatal trauma	3	1.5%
NICU admission	22	10.9%
Neonatal sepsis	5	2.48%
Perinatal mortality	3	1.5%

DISCUSSION

Our study showed a high cesarean rate as against the WHO recommendation on ideal cesarean section rate (10%-15%). Increases in the rate of primary caesarean delivery are known to be a consequence of changes in maternal characteristics and obstetric practice, such as increases in maternal age,

weight, weight gain during pregnancy, labor induction rates [10]. The anticipated continuing temporal changes in these maternal characteristics and obstetric practice patterns predict increasing rates of caesarean delivery in labor. As our center is a tertiary care hospital, more than half of patients are received in advanced labor with dystocia which can also explain the high cesarean rate.

We found in our study that over 1 in every 15 emergency cesarean sections was performed in the second stage of labor. Caesarean section in the second stage of labor can be a technically demanding procedure [11]. The fetal head may be deeply impacted and elongated by moulding in the pelvis, especially after prolonged labor following an unsuccessful attempt at instrumental delivery, further impacting the skull.

In our study, atonic PPH was observed in 15.9% of patients which was slightly higher than the study conducted by Baloch, et al but lower than the study conducted by McKelvey et al [12,13]. Out of the 32 patients who developed atonic PPH, 20 were managed with uterotonic and 12 were managed surgically. Prolonged labor increases the risk of atonic PPH. A slightly higher incidence of atonic PPH could also be explained by the low pre-delivery hemoglobin levels. Extension of uterine incision was found in 6.2% of patients which was less than compared to the study conducted by McKelvey et al [13]. Extension of uterine incision was observed in few cases due to manipulation of the baby at the time of delivery and the presence of a consultant in all deliveries. 3 patients required hysterectomy in our study, all 3 patients

were multigravida with ruptured uterus which were referred to our center.

Controversies regarding the fetal outcome in the cases of caesarean sections in the second stage of labor are seen throughout the literature. Adverse prognostic impact on fetal outcome was noted in the studies conducted by Sucak and Asicioglu et al. [14,15] However, this was contradicted by other studies [16,17]. The most common fetal complication seen in our study was meconium-stained amniotic fluid in 21.2% of cases. Neonatal Intensive Care Unit admission rate in our study was 10.9%. These figures were comparable to the study conducted by Alexander JM et al [17]. This was mostly due to newborns requiring septic screening and intravenous antibiotics. Perinatal deaths recorded in our study were 3 (1.5%) which was comparable to the study conducted by Umbeli T et al. [18]

CONCLUSION

Second stage cesarean section is challenging not only for the obstetricians but also the patient as it is technically difficult to perform and associated with increased maternal and neonatal morbidity. However, the complications can be reduced if these deliveries are attended by consultants and strengthening the referral system in our setup.

REFERENCES

1. Gibbons LBJ, Lauer JA, Betran AP, Meriardi M, Althabe F. The Global Numbers and Costs of Additionally Needed and Unnecessary Caesarean Sections Performed per Year: Overuse as a Barrier to Universal Coverage. World Health Report Background Paper 30. Geneva: World Health Organization; 201
2. World Health Organisation. WHO statement on caesarean section rates. Geneva: WHO; 2015.

3. International Institute for Population Sciences. (2017). NFHS-4 (National Family Health Survey-4)-2015-16-India fact sheet.
4. Levy R, Chernomoretz T, Appelman Z, Levin D, Or Y, Hagay ZJ, Head pushing versus reverse breech extraction in cases of impacted fetal head during caesarean section *Eur J ObstetGynecolReprodBiol* 2005 121:24-6.
5. Fasubaa OB, Ezechi OC, Orji EO, Ogunniyi SO, Akindele ST, Loto OM, Okogbo FO, Delivery of the impacted head of the fetus at caesarean section after prolonged obstructed labor, a randomized comparative study of two methods *J ObstetGynecol* 2002 22:375-8
6. Sung JF, Daniels KI, Brodzinsky L, El-Sayed YY, Caughey AB, Lyell DJ, Caesarean delivery outcome after a prolonged second stage of labor *Am J of ObstetGynecol* 2007 197(306): e1-5.]
7. Alexander JM, Leveno KJ, Rouse DJ, Landon MB, Gilbert S, Spong CY, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ, Sorokin Y, Miodovnik M, O'Sullivan MJ, Sibai BM, Langer O, Gabbe SG, Comparison of maternal and fetal outcome from primary caesarean delivery during the second compared with the first stage of labor *ObstetGynecol* 2007 109:917-21
8. Patwardhan BD, Motashaw ND, Caesarean Section *J ObstetGynecol India* 1957 8:1-15.
- [9]. Khosla AH, Dahiya K, Sangwan K, Caesarean section in a wedged head *Ind J Med Science* 2003 57(50):187-91]
10. Joseph KS, Young DC, Dodds L, et al. Changes in maternal characteristics and obstetric practice and recent increases in primary caesarean delivery. *ObstetGynecol* 2003; 102:791- 800.
11. Allen VM, O'Connell CM, Baskett TF. Maternal and perinatal morbidity of caesarean delivery at full cervical dilatation compared with caesarean delivery in the first stage of labour. *BJOG*. 2005;112(7):986-90.
12. Shahla Baloch, Meharunnissa Khaskheli, Imdad A. Khushk, Aneela Sheeba. Frequency of Second stage Intervention and its outcome in relation with instrumental vaginal delivery versus caesarean section. *J Ayub Med Coll Abbottabad*. 2008;20(1):87-90.
13. A. McKelvey, R. Ashe, D. McKenna, and R. Roberts, "Caesarean section in the second stage of labour: a retrospective review of obstetric setting and morbidity," *Journal of Obstetrics and Gynaecology*, vol. 30, no. 3, pp. 263-267, 2010.
14. Sucak A, Celen S, Akbaba E, Soysal S, Moraloglu O, Danisman N. Comparison of nulliparas undergoing caesarean section in first and second stages of labour: a prospective study in a tertiary teaching hospital. *ObstetGynecol Int*. 2011. 986506.
15. Asıcıoglu O, Güngördük K, Yildirim G, Asıcıoglu BB, Güngördük ÖÇ, Ark C, Günay T, Yenigül N. Second-stage versus first-stage caesarean delivery: Comparison of maternal and perinatal outcomes. *Journal of Obstetrics and Gynaecology*. 2014;34(7):598-604.
16. Selo-Ojeme D, Sathiyathasan S, Fayyaz M. Caesarean delivery at full cervical dilatation versus caesarean delivery in the first stage of labour: comparison of maternal and perinatal morbidity. *Archives of gynecology and obstetrics*. 2008;278(3):245-9. [Link]
17. Alexander JM, Leveno KJ, Rouse DJ, Landon MB, Gilbert S, Spong CY, Varner MW, Moawad AH, Caritis SN, Harper M, Wapner RJ. Comparison of maternal and infant outcomes from primary cesarean delivery during the second compared with first stage of labor. *Obstetrics & Gynecology*. 2007;109(4):917-21. [Link]
18. Umbeli T, Salah Ismail, Kunna A, Elmahgoub A, Nasr A, Rabaa A. Maternal and neonatal complications associated with caesarean section in the second stage of labour at Omdurman maternity hospital during 2012-2013. *Merit Research Journal of Medicine and Medical Sciences*. 2014;2(10):225-8.]

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