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Maternal and fetal outcome in primary second stage cesarean section: A prospective observational study at tertiary centre in South India

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Abstract
There has been increase in the incidence of CS performed and decrease in operative vaginal delivery at full dilatation of cervix. Though the reason is multi factorial, it is technically more challenging and has morbidities specific to, than done in early labor.
A prospective observational study was carried out in the department of Obstetrics and Gynecology, BMCRC, Ballari for one year. A total of 100 singleton primary caesarean section cases that underwent CS in second stage of labor meeting the inclusion and exclusion criteria were recruited in the study. Demographic data, investigations indication were noted. Both intra operative and postoperative details of mother and neonates were documented. The accumulated data was evaluated and statistically analyzed.
Maximum numbers of cases were between 21-25yrs. 80 cases were primigravidae and were of gestational age 39 weeks to 40 weeks. 62 cases were operated for arrest of decent and 53 babies were extracted by Patwardhan method. Angle extension was seen in 6 cases. Prolonged catheterization was done in 14 cases. 40 babies required NICU admission.14 neonates died in the early neonatal period, 50% were due to birth asphyxia.
Quick access to senior obstetrician at all CS deliveries at full dilatation has resulted in more use of Patwardhan method of extraction and less complications. However being tertiary care centre to receive delayed referral, untreated anemia has resulted in more blood transfusions, prolonged catheterization and increased neonatal morbidity and mortality. Further research is needed to frame uniform guidelines, specific technique for delivery of fetus at full dilatation, training module for obstetricians to perform CS in second stage of labor.

Keywords: Cesarean section, second stage of labor, primary cesarean section

Introduction
Childbirth by its very nature carries potential risks for Woman and her baby, regardless of the route of delivery, However, for most pregnancies, which are low risk caesarean delivery appears to pose greater risk of maternal morbidity and mortality than vaginal delivery. The second stage CS is associated with increased maternal and fetal morbidity due to its inherent technical difficulties.
Second stage of labor begins when there is complete cervical dilatation and ends with fetal delivery [1]. There has been an increase in the incidence of caesarean performed at full dilatation [2]. Multiple etiological factors have been identified for this increasing trend of second stage caesareans like decline in the use of instrumental delivery, lack of training and supervision in second stage decision-making, a loss of technique associated with difficult-assisted delivery and concerns relating to maternal and neonatal morbidity with associated litigious issues. This increasing trend of caesarean at second stage is of major concern in current obstetrics [3]. Primary CS has many important implications for future pregnancies and subsequent labor and delivery [4]. It is the most commonly performed major abdominal operation in women all over the world. Variable rates of CS are reported between and within the countries [5], nearly 10-20% of deliveries require intervention most frequently CS [6]. The median duration is approximately 50 minutes for nulliparous and about 20minutes in multiparous [7]. CS at full dilatation is a technically more challenging procedure than CS in early labor. It is because the fetal head can be deeply impacted into the pelvis and the lower segment is thinned out and edematous which makes the procedure technically difficult and hence associated with high maternal and fetal morbidity [3].

It increases the maternal risks such as extension, tears of the uterine angle leading to broad ligament hematoma, major obstetric hemorrhage, longer hospital stay and greater risk of bladder trauma. An increase in neonatal mortality and morbidity is mainly due to hypoxia and fetal trauma [8]. Incidence of second stage cesarean section has increased from 0.9% to 2.2% [9]. Royal college of obstetricians and gynecologists (RCOG) reports that 6% of primary CS occurs at full dilatation [10]. Obstructed labor contributes to an estimated 2.8% of the maternal causes of death worldwide [11]. An estimated 3.1 million deaths occurred in the neonatal period (0-27 days) globally in 2010, where intra partum related complications accounted for 23% (0.7 millions) [12]. This study was undertaken to evaluate the causes, difficulties in management of second stage CS and to revise the strategies of approach**.**

Materials and Methods

A prospective observational study was conducted in Department of Obstetrics and gynecology, BMCRC, Ballari. All primary cesarean sections done in second stage of labor, excluding multiple pregnancies, mal presentation, preterm births were recruited in the study. Analyzing the records of past 3 years estimated sample size was 93 but in one year total 100 cases were recruited in the study. Demographic data, investigations, indication were noted. Both intra operative and post operative details of mother and neonates were documented. The accumulated data was evaluated and statistically analyzed.

Results

All the demographic data, descriptive variables and outcomes are recorded in the tables and analyzed.

76% of women were referred from other facilities due to lack of facilities for CS or lack of expertise doing CS. 87% of cases did not have any intra operative complication where as 6 cases had angle extension, 4 cases had PPH, and bladder injury and broad ligament hematoma noted one in each category.72% did not had any post operative complications, catheterization was prolonged in 14% of cases. Though bladder injury was seen in only one case, prolonged catheterization was advised by operating surgeon due to bladder wall edema and impacted fetal head for longer duration (Referred cases). 7cases had fever, 3 due to surgical site wound infection, 2 due to UTI, 4 due to phlebitis. Only in 10 cases required blood transfusion out of which 7 for preexisting anemia and 3 for PPH.

Discussion

When fetus cannot be delivered with assisted vaginal delivery in second stage, cesarean section is the choice which may pose a risk to mother and to the fetus even though it is done in the interest of both. Current guidelines recommended that operative vaginal deliveries should only be conducted when competency has been achieved or when the consultant is present [2]. Though the cause for second stage CS are multi factorial, there are some modifiable contributors like failed, reduced attempts or no attempts of assisted instrumental delivery which can be addressed by adequate supervised training to improve their competency and confidence.

In this study we tried to assess our standards, expertise, and preparedness to deal the complications. Among the 100 women recruited, majority were between 20-25yrs and primigravida which reflects age of marriage and fertility of women in our area. Second stage CS in primigravida could be because of CPD, rigid perinium, lack of experience of previous labor and built of the women. These results were consistent with other studies [3, 5].

In index study 35 women underwent CS due to arrest of decent in LOA and 26 women for DTA at LOT position, cumulative arrest of decent cases were 61, which was consistent with Sandhya *et al*. [12] and in Thirukumar M study it is 68.9% and 68% respectively [11]. Though adequate time was given with judicious use of oxytocin in those 61cases, lack of skill of midcavity forceps application, fear of fetal compromise might have resulted in increase number of CS.

53 women underwent extraction by Patwardhan method which is because of presence of consultant and good training of trainees in this method, which results in least complication like angle extention which was 6% unlike shanmuga priya *et al* which was 26% though they also used Patwardhan method of extraction in 44.8% of cases [6].

In the index study 4 cases had atonic PPH which was managed medically and one case had bladder injury at the posterior bladder wall which involved serosa and muscularis for which Posterior bladder wall repair was done. One case had broad ligament hematoma which was secured. This is consistent with the study Kamal D, Goswami *et al* in which PPH was seen in 8% of cases. In Jyoti Jayaram *et al*, 26% of PPH cases were seen [4]. The cases which had atonic PPH required prolonged hospital stay for blood transfusions. Among 4 cases which had atonic PPH only 3 cases required blood transfusion for one case parenteral iron infusion was done and prolonged catheterization was done for bladder injury case.

14 cases had prolonged catheterization which was done due to bladder wall edema, which is commonly seen in prolonged second stage, and in 7 cases febrile morbidity was seen. Only in 3 cases wound gaping was seen which was managed by secondary suturing, proper antibiotic coverage preoperatively and postoperatively has reduced the incidence of wound infection in the index study. In the Kamal D Goswami *et al*, wound gaping was seen in 8% of cases and febrile illness in 14% cases [5]. In the study by Kavitha Gupta *et al*, prolonged catheterization was seen in 42% of cases followed by febrile illness in 7% of cases which is consistent with the index study [9].

In the index study 40 babies required NICU admission, and one baby was stillbirth.16 cases had meconium stained amniotic fluid and 10 cases had perinatal asphyxia, as compared to Kavitha Gupta *et al* 16% of NICU admissions were due to perinatal asphyxia [9]. In the study by Thirukumar M, 20% of babies required NICU admission, which is less compared to our study [11]. As there were increased referred cases to our institute from the periphery hospitals, lack of their knowledge to diagnose second stage arrest and delayed referral has caused increased NICU admission. In study by Sandya *et al*, and Kavitha Gupta *et al* the NICU admission were 33% and 44% respectively which is consistent with the index study [9, 1].

Among 40 cases admitted in NICU, 14 cases were early neonatal deaths. Among the 14 cases of ENND, 7 cases were due to perinatal asphyxia, 4 deaths were due to respiratory distress syndrome and 3 deaths were due to early neonatal sepsis. According to the study conducted by Kamal D Gowsami *et al*, neonatal deaths were significantly high due to birth asphyxia which is consistent with the index study [5].

In the index study, the height of the study subjects was as minimum as 141 cms and as maximum as 162cm with the mean being 152.4cms.

The duration of 2nd stage in the study is as minimum as 30mins and as maximum as 192mins with the mean being 103.19mins. As the duration of second stage increases there are more chances of maternal morbidity like bladder was edema, prolonged

catheterization, and uterine atony leading to postpartum hemorrhage and also leads to fetal compromise.

The decision to extraction interval in the study is as minimum as 15mins and as maximum as 95mins with the mean being 45.85mins. Preoccupied OT table, time for arranging blood, requirement of investigations, convincing the attendees for CS were few factors resulted in delay in some cases after reporting to hospital. Incision to extraction interval is as minimum of 2mins to as maximum of 35mins with mean being 7.73 mins.

This observation shows the difficulty in the extraction in deeply engaged head. In this study for most of the cases Patwardhan method of extraction was done. In the study duration of surgery was minimum of 30mins to maximum 120 mins mean being 44mins.

In this study most of the babies were of average weight with mean weight being 2.9kg and mean Apgar at 5th min 6.68. In the study by Thirukumar M, the majority of the babies weights were within the normal range (2500g-3500), which is comparable with the index study, and in the same study all the babies had APGAR score of more than 7 at 5th minute [11].

Table 1: Descriptive Statistics N = 100

	Minimum	Maximum	Mean	S.D
Age	18.0	35.0	22.97	3.23
Height in cms	141.0	162.0	152.45	4.29
Duration of 2nd stage (mins)	30.0	192.0	103.19	38.75
Decision to extraction Interval (mins)	15.0	95.0	45.85	18.11
Incision to extraction interval	2.0	37.0	7.73	4.42
Duration of Surgery (mins)	30.0	120.0	44.90	11.10
Hospital stay	3.0	18.0	4.41	1.64
Birth Weight	2.00	4.00	2.99	0.42
Apgar at 1st min	1	8	4.74	1.37
Apgar at 5th min	2	9	6.68	1.50

Table 2: Parity of women N=100

Variable	Frequency
Primipara	80
Multipara	20
Total	100

Table 3: Period of Gestation N = 100

Period of gestation	Frequency
Upto38Weeks	8
38+1dayto39Weeks	24
39+1to40Weeks	35
Above40Weeks	33
Total	100

Table 4: Intra operative vertex position N =100

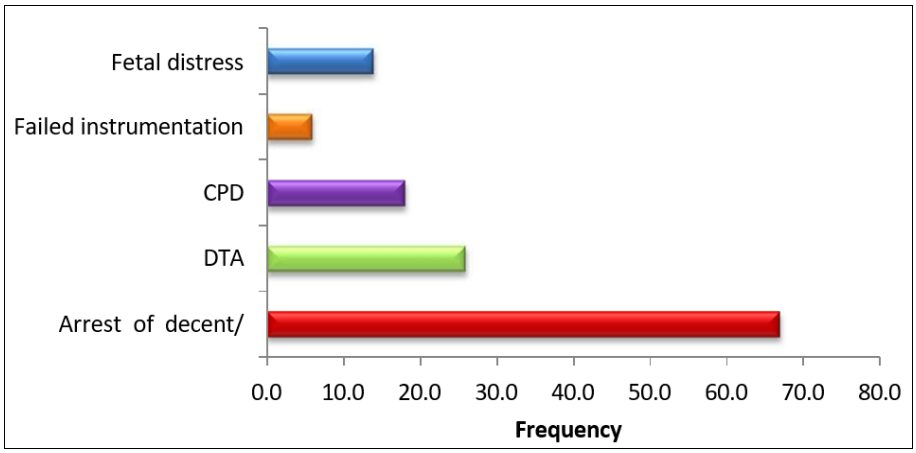
Vertex position	Frequency
LOA	35
LOP	5
LOT	29
ROA	9
ROP	7
ROT	15
Total	100

Table 5: Method of extraction N =100

Method	Frequency
Patwardhan	53
Pull method	10
Push method	2
Modified Patwardhan	3
Vertex	32
Total	100

Table 6: Indication for NICU admission and Outcome

Indication	Neonates (N=40)	ENND (N=14)
Perinatal asphyxia	10	7 (Birth asphyxia)
Respiratory distress	10	4 (RDS)
Meconium stained amniotic fluid	16	3 (Sepsis)
Low APGAR	4	0
Total	40	14



Graph 1: Indication for caesarean section

Conclusion

Quick access to senior obstetrician at all CS deliveries at full dilatation has resulted in more use of Patwardhan method of extraction and less complications. However being tertiary care centre to receive delayed referral, untreated anemia has resulted in more blood transfusions, prolonged catheterization and increased neonatal morbidity and mortality. Further research is needed to frame uniform guidelines, specific technique for

delivery of fetus at full dilatation, training module for obstetricians to perform CS in second stage of labor.

Conflict of Interest
Not available.

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