

# International Journal of Clinical Obstetrics and Gynaecology

ISSN (P): 2522-6614  
ISSN (E): 2522-6622  
© Gynaecology Journal  
www.gynaecologyjournal.com  
2019; 3(5): 166-169  
Received: 19-07-2019  
Accepted: 21-08-2019

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## Fetomaternal outcome of nulliparous women undergoing caesarean section in first and second stage of labour: A prospective study in a tertiary care centre of Puducherry

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**DOI:** <https://doi.org/10.33545/gynae.2019.v3.i5c.348>

### Abstract

**Background:** Caesarean section at full cervical dilatation has many implications for maternal and neonatal morbidity as well as in subsequent pregnancy outcomes. However alarming rise in caesarean section has been reported with increase in concern for the rate of second stage caesarean section.

**Aims of the study:** To compare the Fetomaternal outcome in nulliparous women undergoing cesarean section in first and second stage of Labour

**Material and methods:** This is a one year prospective study conducted at Mahatma Gandhi Medical College & Research Institute, Puducherry. Total number of patients who underwent caesarean delivery in first stage of labour are 400 (Group 1) and in second stage are 130 (Group 2) during the study period. These two groups were then compared in terms of maternal demographics, labour characteristics, maternal outcomes and neonatal outcomes

**Results:** Caesarean delivery performed in the second stage were associated with increased maternal morbidity such as hemorrhage, uterine angle extension, blood transfusions, prolonged hospital stay, febrile morbidity, urinary system injury. Similarly neonatal morbidity was much higher in patients who underwent caesarean section in second stage of labour. There was increase in neonatal complications such as APGAR less than 7 at 5 minutes, NICU admissions for more than 24 hours, neonatal septicemia ( $p < 0.001$ )

**Conclusion:** The present study suggests that women undergoing caesarean section in second stage of labour have increased maternal and fetal morbidity and they require special care. Hence appropriate selection of mode of birth should be decided carefully and judiciously to decrease maternal neonatal morbidity.

**Keywords:** Caesarean section, fetomaternal outcome, nulliparous, first & second stage of labour

### Introduction

Caesarean section is the most commonly performed abdominal operative procedure among women all over the world [1]. The increase in the incidence of caesarean section are of major clinical interest in field of obstetrics in this modern era. As per the latest Indian data (National Family Health Survey 2015-2016, NFHS-4) the caesarean rate at the population level seems to be ranging between 17.2%- 20% [2]. Second stage caesarean section has been reported as an issue of concern due to its high prevalence with increasing caesarean section rates. Incidence of second stage caesarean section has increased significantly from 0.9 to 2.2% [3]. Knowledge gained from recent literature, evidenced that this trend is multifactorial including combination of inefficient training and supervision of junior staff in second stage decision making, lack of expertise in difficult assisted vaginal delivery and concern of litigious issues relating to maternal and neonatal morbidities [4]. Increase of primary caesarean section has an impact on future pregnancies and subsequent labour and delivery.

The Royal College of Obstetricians and Gynecologists reported that approximately 6% of primary caesarean sections occurs at full cervical dilatation and in among half of these deliveries, there was no attempt at an instrumental delivery. Caesarean section at full dilatation with or without attempt at operative vaginal delivery is technically more challenging surgical procedure than caesarean section in early labour [5].

The second stage caesarean section is known to have higher rates of maternal morbidity. Prolonged second stage is directly correlated with incidence of the uterine angle extension,

Prolonged surgical time, post-partum haemorrhage, bladder injury, puerperal pyrexia, length of hospital stay [6, 7]. Neonatal morbidity includes fetal. Academia, trauma (cephalhaematoma and intracranial haemorrhage, lacerations, facial nerve palsies) and leading to subsequent neonatal intensive care admissions [8]. The present prospective observational study was undertaken with a novel aim to compare fetomaternal outcome in nulliparous women undergoing caesarean section in first and second stage of labour.

### Aims and Objectives

To compare the fetomaternal outcome in nulliparous women undergoing caesarean section in first and second stage of Labour.

### Materials and methodology

The prospective observational study was conducted for one year period between November 2015 to November 2016 in Department of Obstetrics & Gynaecology, Mahatma Gandhi Medical College & Research Institute, Puducherry after obtaining Institute Ethics Committee clearance.

Inclusion criteria for the study were nulliparity, singleton fetus with vertex presentation, at term undergoing caesarean section without any maternal comorbidities.

Total number of patients who underwent caesarean delivery in first stage of labour are 400 and in second stage are 130 during the study period. These were categorized as

Group- 1: CD in first stage of Labour (n=400)

Group-2: CD in second stage of Labour (n=130)

These two groups were then compared in terms of maternal

demographics, labour characteristics, maternal outcomes and neonatal outcomes Numerical variables were compared between groups by calculating p value for each variables and value <0.05 was taken as statistically significant

### Results and observations

A total number of 1619 patients underwent Caserean section in the study period. Among which 24.71 % [400 cases] were in first stage and 8.03% [130 cases] were in Second stage as shown in Table-1

**Table 1:** Total number of cases

Total No of Lscs	1619
1ST STAGE CS (Group 1)	400 [24.71%]
2ND STAGE CS (Group 2)	130 [8.03%]

Maternal demographics and labour characteristics are depicted in Table -2. There was no significant difference noted for mean maternal age and mean gestational age between group 1 and group 2. The number of women who were induced/augmented in group 1 were 320 out 400 and in group 2 was 110 out of 130.

Mean dilatation in group was 5cm whereas in group 2 it was 10 cm. Operative duration and length of hospitalization were significantly greater among group 2 (42.30±6.53 minutes, 11.56±5.43 days) when compared to group 1 (30.23±5.64 minutes, 7.10±1.63 days).

Mean duration of labour was significantly longer in group 2 when compared to group 1 (p value <0.0001)

**Table 2:** Patient Characteristics

Patient Characteristics	Group 1 (n=400)	Group-2 (n=130)	t test	Degree of freedom (df)	p Value
Age(in years)	22.75±3.87	22.40±3.70	0.9	528	0.366
Gestational Age(Weeks)	39.24±1.28	39.25±1.12	0.07	528	0.936
Mean Dilatation Of Cervix (cm)	5	10	-	-	0.0002
No of Patients Induced/Augmented	320	110	-	-	-
Duration Of Labour(Hrs)	9.81±2.76	11.15±1.78	5.19	528	0.0001
Operative Duration(Mins)	30.23±5.64	42.30±6.53	20.37	528	0.0001
Length Of Stay(Days)	7.10±1.63	11.56±5.43	14.55	528	0.0001
Episiotomy	0	10			

Maternal morbidity in both the groups was calculated and comparative analysis was done in terms of p value (Table-3). Uterine atonicity and uterine artery ligation was observed significantly among Group 2 cases. In group 1, only 3.25% patients underwent blood transfusion whereas in Group 2 blood transfusion was in 26.15% of patients, thus giving a significant p

value of 0.0001. Bladder high up, urinary system injury and hematuria like complications were encountered in group 2 than group 1 (p value<0.001). Unintended Lower uterine segment extensions were significantly greater in group 2 than group 1 (p value of 0.0001). Wound dehiscence and febrile morbidity were encountered significantly more among group 2 cases.

**Table 3:** Intraoperative Findings and Complications of Cs

Maternal complications	No. of Events	Group 1 (N=400)	Group 2 (N=130)	Z value	p value
Uterine Atonia	46	20 (5%)	26(20%)	5.3	0.0001
Uterine Artery Ligation	10	2 (0.5%)	8(6.15%)	4.11	0.0001
Blood Transfusion Required	47	13(3.25%)	34(26.15%)	7.3	0.0001
Bladder High Up	55	3(3.75%)	52 (40%)	12.7	0.0001
Lower Uterine Segment Tear Angle Extension	57	07(1.75%)	50(38.5%)	11.7	0.0001
Hematuria	49	6(1.5%)	43(33.8%)	10.8	0.0001
Febrile Morbidity	50	15(3.75%)	35(26.9%)	7.8	0.0001
Wound Dehiscence	34	14(3.5%)	20(15.4%)	4.8	0.0001
Urinary System Injury	5	1(0.25%)	4 (3.1%)	2.9	0.004
Hystrectomy	3	1(0.25%)	2(1.5%)	1.7	0.09

Neonatal outcomes were defined in terms of NICU admission more than 24 hours, 5 mins APGAR score <7, neonatal septicemia, neonatal deaths etc.. As depicted in Table 4. Among

the variables, 5 minutes Apgar score <7 were commoner in group 2 patients than group 1 with a p value of 0.0001.

Eight percent of newborns in group 1 were admitted to NICU for

more than 24 hours duration when compared to 46.15% of newborn from group 2 and the results were statistically significant. Neonatal trauma and neonatal septicemia were

significantly seen higher in group 2 newborns. Hence neonatal morbidity was definitely higher in group 2 newborns than group 1 newborns.

**Table 4:** Neonatal Complications

Neonatal complications	Group 1 (N=400)	Group 2 (N=130)	Z value	p value
APGAR<7 AT 5 Mins	30(7.5%)	44(33.85%)	7.5	0.0001
Birth Weight (Kg)	3.1±0.4	3.3±0.5	-	0.0001
Requirement of NICU > 24 hours	32(8%)	60(46.15%)	9.9	0.0001
Neonatal trauma	1(0.25%)	6 (4.62%)	3.8	0.0002
Neonatal seizures	0	1		
Neonatal septicemia	10(2.5%)	26(20%)	6.9	0.0001
Neonatal death	0	0		

## Discussion

The present prospective study was conducted for a period of one year duration at department of Obstetrics & Gynaecology, Mahatma Gandhi Medical college and Research Institute, Puducherry. In the present study, among 1619 Caesarean section, 530 Caesarean sections were performed in nulliparous women. Among those 530 cases of Caesarean Section, 400 cases were performed in the first stage and 130 cases were performed in the second stage of labour.

The present study demonstrates that Caesarean Section delivery done in second stage is associated with higher maternal and neonatal morbidity. Caesarean Section done in second stage of labour is a challenging surgery due to distortion of pelvic anatomy by the fetal head that is often deeply impacted in the maternal pelvis.

The maternal demographics and labour characteristics of the present study are coinciding with those observations reported by Ascioglu *et al.*, Das *et al.* and Sinha *et al.* [9, 10, 11].

Women delivered by Caesarean Section at full dilation have a higher risk of postpartum hemorrhage, operative morbidity with visceral injury, sepsis and prolonged hospital stay. The present study demonstrates that urinary system injury was increased almost 3 times in Group 2 (caesarean section done in second stage of labour) because the caesarean section done in second stage is technically more difficult. Uterine atonicity and requirement of uterine artery ligation in case of severe haemorrhage were also found to be more frequent in Group 2. It can be due to longer labour resulting in uterine fatigue. Maternal morbidity in the present study is higher in Group 2 when compared to Group 1 concurring with observations of Ascioglu *et al.*, Allen *et al.*, Sucak A *et al.*, Rabiou KA *et al.* [9, 12, 14]. The maternal morbidities are increased due to difficulty in handling the deeply impacted fetal head in maternal pelvis.

Caesarean section performed in second stage of labour increases the neonatal morbidities like increase in incidence of fetal injury, septicemia, NICU admissions and rarely fetal death. These unfavorable neonatal outcomes are probably due to prolongation of labour which leads to an increased risk of perinatal asphyxia and decrease in 5 minute Apgar score. Neonatal complications of the present study were more in Group 2 which was in concordance with studies done by Allen VM, Sucak A, Rabiou KA and Radha P [12, 15]. Similar study done by Das *et al.* also demonstrated a statistically significant increase in admissions to NICU, septicemia, low 5 minutes APGAR and neonatal trauma [10].

## Conclusion

The present study suggests that women undergoing caesarean section in second stage of labour have increased maternal and fetal morbidity and they require special care. Hence appropriate

selection of mode of birth should be decided carefully and judiciously to decrease maternal neonatal morbidity.

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