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Original Research Article

## A prospective observational study of fetomaternal outcome in second stage caesarean section

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### ABSTRACT

**Background:** Incidence of caesarean section is rapidly rising over last two decades and one fourth is contributed by caesarean section in second stage. The objective of this study was to study of fetomaternal outcome in second stage caesarean section.

**Methods:** Prospective observational study was done in 80 women undergoing second stage caesarean section from December 2015 to march 2017 at Lady Hardinge Medical Collage Delhi. These women observed from labour to caesarean section in second stage of labour till post-operative period for any complication. Intraoperative and postoperative complications were observed in these women.

**Results:** Caesarean section rate was 22% in which 3.9% were done in second stage of labour. Most common gestational age being 39-40 weeks (47%). Most common indication being deep transverse arrest (41.25%). Intraoperative complication as bladder injury (5%), extension of uterine incision (23%), PPH (33%) and need for blood transfusion (31%) and post-operative complication as wound sepsis in 58% and 20% requiring resuturing, post-operative fever, prolong hospital stay, prolonged catheterization etc. neonatal complications as severe birth asphyxia (2.5%), respiratory distress (55%), need for mechanical ventilation.

**Conclusions:** Thus, caesarean section done in second stage of labour is associated with increased maternal and neonatal morbidity.

**Keywords:** Caesarean section, Complication, Maternal and neonatal morbidity, Second stage of labour

### INTRODUCTION

Caesarean section is the most commonly performed major abdominal operation and its incidence ranges from 0.4-42.3%.<sup>1,2</sup> Incidence of caesarean section is rapidly rising over the last two decades.<sup>3</sup>

The reason is mainly attributed to the improved safety of anaesthetic intervention, surgical technique, advanced technology, knowledge of intensive care medicine, availability of blood and fear of litigation amongst

obstetrician due to remote complication of birth asphyxia. Caesarean section performed in second stage of labour constitutes one fourth of all caesareans done and is associated with increased complication such as obstetric haemorrhage, injury to surrounding organs, extension of uterine incision leading to broad ligament haematoma formation, need for stepwise devascularisation, caesarean hysterectomy, ICU admission, increased infection and prolonged hospitalisation.<sup>4</sup> Neonatal morbidity includes birth asphyxia, respiratory distress, NICU admission, fetal injury, neonatal septicaemia and neonatal seizure.

Objective of this study was to determine the maternal and neonatal outcome in women undergoing second stage caesarean section.

## METHODS

A prospective observational study was conducted in the department of obstetrics and gynaecology in collaboration with department of paediatrics, Lady Hardinge Medical College and Kalawati Saran Children's Hospital New Delhi from December 2015 to March 2017. 80 women were selected after fulfilling inclusion and exclusion criteria.

### Inclusion criteria

- All uncomplicated singleton, term gestation > 37 weeks, with cephalic presentation, in second stage of labour were included.

### Exclusion criteria

- Women with IUD, multiple pregnancy, not giving consent and women with obstetric complications like APH, FGR, GDM, previous caesarean.

Detailed history and examination were carried out and progress of labour was managed by partogram. Decision making for emergency second stage caesarean section, level of surgeon making decision and its indications, time from decision to delivery of baby interval and total duration of second stage of labour was recorded. Intra operative finding was recorded and complication such as extension of uterine incision, formation of broad ligament haematoma, bladder and bowel injury, PPH, blood transfusion, requirement of step wise devascularisation, caesarean hysterectomy and need for ICU admission if any was recorded. Neonates were evaluated in terms of birth weight, Apgar score at 1 min and 5 min of birth, requirement for resuscitation, birth asphyxia, NICU admission, need for mechanical ventilation, presence of hypoxic ischemic encephalopathy and fetal injury recorded by paediatrician of at least senior resident calibre. All neonates were observed till 7 days of birth for complications if any.

## Statistical analysis

The data was be collected and recorded on SPSS (Statistical package for social sciences) version 18. All the qualitative variables were recorded and percentages and proportions were calculated. The association between qualitative dependent variables and the outcome variables were analyzed by using Chi square test. For calculating the strength of association Odds ratio was calculated. In quantitative variables - mean and standard deviation was calculated and for testing the statistical relation of the quantitative dependent variable with the outcome variable student "t" test was applied. The association between quantitative dependent variables and the outcome variables will be analyzed by using Chi square test. The p value of less than 0.05 will be taken as statistically significant for commenting upon association.

## RESULTS

Total number of deliveries during this period was 22014, out of which NVD were 17165 and caesarean deliveries were 4849. Thus, caesarean section rate was 22% out of which 3.9% caesarean sections were done in second stage of labour. Second stage CS compared to 1<sup>st</sup> stage is associated with increased complications.

**Table 1: Distribution as per gestational age.**

Gestational age (weeks)	Number of women (n)	Percentage %
< 38	11	13.75
38-39	20	25
39-40	35	43.75
40- 41	12	15
> 41	2	2.5
Total	80	100

On analyzing the Table 1 it was found that out of 80 women, 11 women (13.75%) were of gestational age < 38 weeks, 20 women (25%) had gestational age of 38-39 weeks, 35 women (43.75%) belonged to gestational age of 39-40 weeks, 12 women (15%) had gestational age between 40-41 weeks, and only 2 women (2.5%) had gestational age of > 41 weeks.

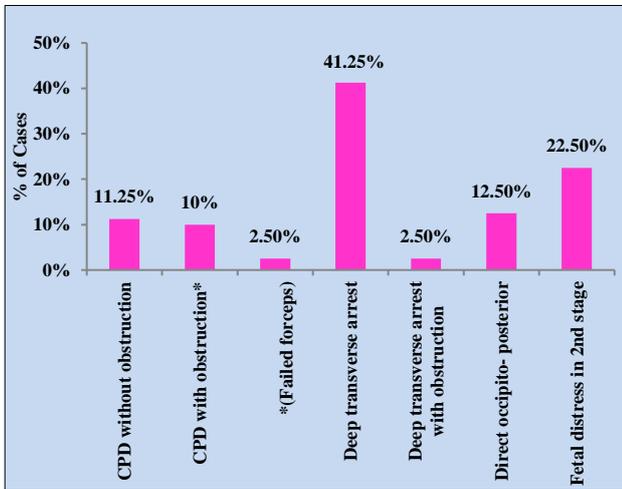
**Table 2: Distribution of women according to labour characteristics.**

Labour characteristics		Number of women (n)	Percentage %
Onset of labour	Spontaneous	69	86.25
	Induced	11	13.75
Oxytocin augmentation	Done	50	62.5
PROM	Present	22	27.5
Frequency of P/V > 4	Present	41	51.25

Table 2 shows the labour characteristics of women who had undergone second stage caesarean section. Majority

69 out of 80 (86.25%) women had spontaneous onset of labour and 11 out of 80 women (13.75%) required

induction of labour. 50 out of 80 women (62.5%) required oxytocin augmentation. 22 women (27.5%) had PROM. Multiple P/V examination  $\geq 4$  in number was observed in 41 women (51.25%) leading to increased incidence of post-operative wound sepsis.



**Figure 1: Distribution of the women according to indication for caesarean section.**

**Table 3: Distribution of women according to intra-operative complications.**

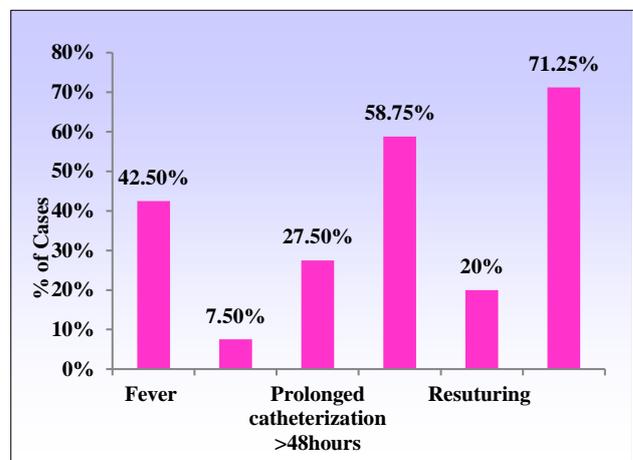
Intra operative complication	Number of women (n)	Percentage %
Bladder injury	4	5%
Extension of incision	19	23.75%
Broad ligament haematoma	2	2.5%
<b>PPH</b>		
Total	27	33.75%
Atonic	10	12.5%
Traumatic	17	21.25%
Need for blood transfusion	25	31.25%

This Figure 1 depicts that CPD was seen in 17 out of 80 women (22.25%) in which 9 women (11.25%) had CPD without obstruction, 8 women (10%) had CPD with obstruction. 43.75% had DTA and 2.5% had DTA with

obstruction. Direct occipito posterior was present in 12.5% and fetal distress in 22.5%. Caesarean section done with obstructive features had increased risk of intraoperative and post-operative complication.

Thus, most common indication for second stage caesarean section was deep transverse arrest (41.25%) and least common indication failed forceps (2.5%).

Table 3 shows intra operative complications in women with second stage caesarean section. Bladder injury was present in 4 out of 80 women (5%), extension of uterine incision in 19 out of 80 women (23.75%) and broad ligament hematoma in 2 out of 80 women (2.5). 27 women out of 80 (33.75%) had PPH in which 12.5% had atonic and 21.25% women had traumatic PPH. 25 out of 80 women (31.25%) required blood transfusion.



**Figure 2: Distribution of women according to post-operative complication.**

Figure 2 depicts the presence of various complications in post-operative period. Out of 80, 34 women (42.5%) had fever, 6 out of 80 women (7.5%) had paralytic ileus and 22 out of 80 women (27.5%) had prolonged catheterization (> 48 hours). Wound sepsis was present in 47 out of 80 women (58.75%) and 16 out of 80 women (20%) required resuturing of abdominal wound. 71.25% of women had hospital stay of > 7 days.

**Table 4: Distribution of woman according to pre-operative and post-operative Hb.**

Haemoglobin in gm/dl	Number of women with pre-operative Hb level (n)	Percentage %	Number of women with post-operative Hb level (n)	Percentage %	p value
12-14	26	32.5	0	0	< 0.001
10-11.9	42	52.5	22	27.5%	
8.9-9.9	12	15	39	48.75%	
< 8.9	0	0	19	23.75%	
Mean±SD	11.35±1.11		9.32±0.86		
Mean difference ±SD	2.04±0.85				

This Table 4 depicts the haemoglobin level in women in pre and postoperative period. Mean Hb level preoperatively was  $11.35 \pm 1.11$  gm% while mean post-operative Hb level was  $9.32 \pm 0.86$  gm%. Preoperative Hb level was between 10-11.9 g/dl of 42 women (52.5%), 12-14 g/dl of 26 woman (32.5%), 8.9-9.9 g/dl of 12 woman (15%) and none of them had Hb level of < 8.9

g/dl. Postoperative Hb level of same women was between 8.9-9.9 g/dl of 39 women (48.75%), 10-11.9 g/dl in 22 women (27.5%), < 8.9 in 19 women (23.75%) and none had Hb between 12-14 g/dl. The mean difference in both was  $2.04 \pm 0.85$ . Thus, there was a significant fall in haemoglobin level ( $11.35 \pm 1.11$  versus  $9.32 \pm 0.86$  with p value of < 0.001).

**Table 5: Distribution according to neonatal complication.**

Fetal complication	Number on neonates (n)	Percentage %
Severe birth asphyxia	2	2.5%
Respiratory distress	44	55%
Requirement for resuscitation	46	57.5%
Birth injury (failed forceps)	2	2.5%
Need for mechanical ventilation/resuscitation with IPPV	12	15%

Table 5 shows the distribution of women according to presence of fetal complication and it was found that 57.5% of neonates required resuscitation after delivery in the form of bag and mask ventilation. Birth in injury was seen in 2.5% and 15% required mechanical ventilation with IPPV.

## DISCUSSION

The present study was prospective observational study conducted in the department of obstetrics and gynaecology at Lady Hardinge Medical College and Smt. Sucheta Kriplani Hospital, New Delhi from December 2015 to March 2017. Caesarean section rate was 22% out of which 3.9% were done in second stage of labour. In the present study the mean gestational age of women was  $38.6 \pm 2.15$  weeks which was comparable to the study done by Ascioglu et al ( $38.9 \pm 0.9$  weeks), Das S et al ( $38.5 \pm 1.29$  weeks).<sup>5,6</sup>

A total 86.25% women had spontaneous onset of labour and 13.75% required induction of labour and 63.75% required oxytocin augmentation. In the similar study by Jain et al, it was observed that 80% women had spontaneous onset of labour and 86% required oxytocin augmentation.<sup>7</sup> Thus, it is obvious from above study that though onset of labour may be spontaneous yet they require oxytocin augmentation usually due to slow progress of labour due to uterine inertia.

In the present study the most common indication for second stage caesarean section was DTA (43.75%), followed by CPD (21.25%) which was comparable to the study by Jain et al, Jayaram J et al.<sup>7,8</sup> Mean duration of first and second stage of labour was  $12.69 \pm 1.78$  hours and  $2.39 \pm 0.6$  hours respectively which was comparable to the study carried out by Allen et al.<sup>4</sup> Mean duration from decision to delivery interval was 2.2 hour which was comparable to results obtained by Jain et al.<sup>7</sup> Women with longer decision to delivery interval were associated with increased per operative complication due to

increased attenuation of LUS and impaction of fetal head predisposing them to have more extension of uterine incision, PPH and bladder injury.

### Maternal outcome

In the present study bladder advancement and thinning of LUS was present in 68.75% and 65% respectively which was comparable to the study conducted by Shobha T et al.<sup>9</sup> Average duration of surgery in the present study was observed 96 minutes, ranging from 60 min - 150 minutes and was comparable to the study done by Jain et al, Ascioglu et al and Prameela et al and Moodley et al observed the average duration of surgery 35 min, with range of  $51.21 \pm 2.6$  min and 69 minutes respectively.<sup>5,7,10,11</sup>

### Intraoperative complication

In the present study bladder injury was found in 5% women which was almost comparable to the study done by Das S et al and Ascioglu et al and extension of uterine incision was observed in 6.4% women which was similar to the study conducted by Allen et al.<sup>4,6</sup> The reason for increased bladder injury and extension of uterine incision in second stage caesarean can be due to presence of bladder advancement and thinned out edematous lower uterine segment.

Postpartum haemorrhage (PPH) was observed in 33.75% women and 0.9% women required blood transfusion which was comparable to study conducted by Ascioglu et al, Narayen J et al and Shobha T et al.<sup>5,8,9</sup> The reason for increased occurrence of PPH may be due to increased risk of uterine wound extension causing traumatic PPH as a result of technical difficulty and presence of atonic PPH due to prolonged labour leading to uterine inertia. Broad ligament haematoma was present in 2.5% women comparable to Malathi J et al.<sup>12</sup>

### **Post-operative complication**

In the present study prolonged catheterization of > 48 hours were present in 27.5% women of which 5% had bladder injury was comparable to the study conducted by Jain et al.<sup>7</sup> Febrile morbidity was present in 42.5% women postoperatively which was comparable to the study done by Jain et al 38%.<sup>7</sup> On contrary study done by Malathi J et al found febrile morbidity in 16% while Allen et al had seen it only in 1.1% cases.<sup>4,12</sup>

A total 7.5% of women developed paralytic ileus in the post-operative period which was 2% in study by Malathi J et al and 29% in study by Jain et al.<sup>7,12</sup> Wound infection rate in the present study was 66.25% and 20% of them required re suturing of wound which was higher than the study by Malathi J et al where wound infection rate of 12% and 8% required re suturing.<sup>12</sup> Higher percentage of wound infection was due to prolonged leak P/V, multiple P/V examination of ( $\geq 4$ ).

### **Neonatal outcome**

In the present study 2.5% neonates had low Apgar < 5 and suffered from severe birth asphyxia. While Allen et al, observed severe birth asphyxia in 11% neonates.<sup>4</sup> In the study by Jain et al 36.3% neonates required resuscitation whereas in present study resuscitation was required in 57.5% of neonates.<sup>7</sup> NICU admission was required in 13.7% neonates which was comparable to study by Das S et al where 12% of neonates required NICU admission.<sup>6</sup> In the present study 2.5% neonates sustained birth injury due to failed instrumental delivery. Neonatal death was seen in 2.5% in present study, comparable to the study by Jain et al where neonatal death had occurred in 3.7% of neonates.<sup>7</sup>

### **CONCLUSION**

Women with prolonged duration of second stage were associated with increased maternal and neonatal complication. Intraoperative complications were seen like extension of uterine extension, bladder injury, PPH, blood transfusion and broad ligament hematoma. Postoperative complication in these women was fever, wound sepsis, paralytic ileus, prolonged catheterization and prolonged hospital stay.

Neonatal complications were severe birth asphyxia, low Apgar, birth injury, NICU admissions and early neonatal death. Thus, caesarean section in second stage is associated with increased maternal and fetal morbidity and requires special care. Emphasis should be focused on assuring normal progression of labour and proper use of partogram.

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*Ethical approval: The study was approved by the Institutional Ethics Committee*

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