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A Prospective Observational Study of Fetomaternal Outcome in Second Stage Caesarean Section

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Abstract
Introduction: *Cesarean delivery is defined as the birth of the fetus through incisions in the abdominal wall and the uterine wall. Cesarean is the most commonly performed major abdominal operation in women all over the world. Variable rates of cesarean sections are reported between and within the countries.*
Materials and Methods: *A prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Bankura Sammilani Medical College, Bankura, West Bengal from January 2018 to December 2018. 80 women were selected after fulfilling inclusion and exclusion criteria. 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 hematoma, bladder and bowel injury, PPH, blood transfusion, requirement of step wise revascularization, Caesarean hysterectomy and need for ICU admission if any was recorded.*
Results: *Caesarean section rate was 38% 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, postoperative fever, prolong hospital stay, prolonged catheterization etc. neonatal complications as severe birth asphyxia (2.5%), respiratory distress (55%), need for mechanical ventilation.*
Conclusion: *Thus, caesarean section done in second stage of labour is associated with increased maternal and neonatal morbidity.*
Key Words: *Cesarean, bowel injury, PPH, blood transfusion*

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I. Introduction

Cesarean delivery is defined as the birth of the fetus through incisions in the abdominal wall and the uterine wall.[1] Cesarean is the most commonly performed major abdominal operation in women all over the world.[2] Variable rates of cesarean sections are reported between and within the countries. The rate of cesarean delivery continues to increase despite efforts to constrain operative abdominal deliveries. This is a cause for concern because cesarean section is associated with higher likelihood of adverse outcome for both mother and fetus as compared to vaginal delivery.[3]

Cesarean can be performed before labor, during first and second stages of labor. A decrease in the rates of operative vaginal delivery has been observed with a corresponding increase in the cesarean deliveries during second stage of labor.[4]

Second stage of labor begins when cervical dilatation is complete and end with the fetal delivery. There has been considerable debate in the recent years on the duration of the second stage of labor.[5] In the past the second stage of labor was limited to < 2 hours. Recently the duration of second stage is extended up to three hours with regional anaesthesia. [6]

Second stage interventions are the methods to facilitate delivery of the fetus in the form of assisted vaginal delivery or by instrumental delivery. Worldwide, 10-20% of deliveries require some form of intervention which is frequently cesarean section.[7] A second stage cesarean is technically difficult due to engagement of the fetal head and is associated with increased maternal and fetal morbidity. The maternal

morbidity includes major hemorrhage, uterine incision extension into the broad ligament and prolonged operating time. Neonatal mortality and morbidity is mainly due to hypoxia and fetal trauma.[8]
This is a prospective observational study of fetomaternal outcome in cesarean sections done in second stage of delivery.

II. Materials And Methods

A prospective observational study was conducted in the Department of Obstetrics and Gynaecology, Bankura Sammilani Medical College, Bankura, West Bengal from January 2018 to December 2018. 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 hematoma, bladder and bowel injury, PPH, blood transfusion, requirement of step wise revascularization, 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 pediatrician 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.

III. 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 38% out of which 3.9% caesarean sections were done in second stage of labour. Second stage CS compared to 1st stage is associated with increased complications.

S.No	Gestational age (weeks)	Number of women	Percentage
1	<38	11	13.75
2	38-39	20	25
3	39-40	35	43.75
4	40-41	12	15
5	>41	2	2.5
6	Total	80	100

Table 1: Distribution as per gestational age

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.

Labour characteristics		Number of women	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: Distribution of women according to labour characteristics

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 ≥ 4 in number was observed in 41 women (51.25%) leading to increased incidence of post-operative wound sepsis.

Intra Operative complication		Number of women	Percentage
Bladder injury		**4**	**5%**
Extension of incision		**19**	**23.75%**
Broad ligament haematoma		**2**	**2.5%**
PPH	**Total**	**27**	**33.75%**
	Atonic	**10**	**12.5%**
	Traumatic	**17**	**21.25%**

Table 3: Distribution of women according to intraoperative complications

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.

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				

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

This Table 4 depicts the haemoglobin level in women in pre and postoperative period. Mean Hb level preoperatively was 11.35±1.11 gm% while mean postoperative Hb level was 9.32±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±0.85. Thus, there was a significant fall in haemoglobin level (11.35±1.11 versus 9.32±0.86 with p value of < 0.001).

Fetal complication	Number of neonates	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: Distribution according to neonatal complication

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.

IV. Discussion

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. Mean duration of first and second stage of labour was 12.69±1.78 hours and 2.39±0.6 hours respectively which was comparable to the study carried out by Allen et al. Mean duration from decision to delivery interval was 2.2 hour which was comparable to results obtained by Jain et al. 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.[9]

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.9 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 Asicioglu et al and Prameela et al and Moodley et al observed the average duration of surgery 35 min, with range of 51.21±2.6 min and 69 minutes respectively.[10]

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 Asicioglu et al and extension of uterine incision was observed in 6.4% women which was similar to the study conducted by Allen et al. 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.[11]

Postpartum haemorrhage (PPH) was observed in 33.75% women and 0.9% women required blood transfusion which was comparable to study conducted by Asicioglu et al, Narayen J et al and Shobha T et al. 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.[12]

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. Febrile morbidity was present in 42.5% women postoperatively which was comparable to the study done by Jain at al 38%. 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.[13]

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. 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. Higher percentage of wound infection was due to prolonged leak P/V, multiple P/V examination of ($\geq$ 4).[14]

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. In the study by Jain et al 36.3% neonates required resuscitation whereas in present study resuscitation was required in 57.5% of neonates. 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. 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.[15]

V. 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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