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**ORIGINAL ARTICLE**

**Maternal and fetal outcome in Caesarean Section done in active phase of labour**

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**ABSTRACT**

*Labour is defined as series of events that takes place in the genital organs in an effort to expel the viable products of conception (fetus, placenta and membranes) out of the womb through the vagina into the outer world. This study is to evaluate the maternal and fetal outcome in cesarean section done in active phase of labour. Based on the findings, the study concluded that women undergoing cesarean section in the late active phase of labour are associated with intra operative maternal complications and post operative maternal morbidities and neonatal morbidities requiring special care.*

**Keywords:** Cesarean, Latent phase, Active phase

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**INTRODUCTION**

Cesarean section is the most commonly performed surgery in women all over the world. There are four stages of labour. First stage of labour starts from the onset of true labour pain and ends with full dilatation of cervix [1]. There are two phase of first stage of labour called latent phase and active phase. The latent phase is a period of time characterized by painful uterine contractions and variable changes of the cervix, including some degree of effacement and slower progression of dilatation up to 4 cm. The active phase is a period of time characterized by regular painful uterine contractions and more rapid cervical dilatation from 4 cm until full dilatation. The second stage of labour can be defined as the time elapsed from full dilatation of cervix to delivery of the fetus. The third stage begins after the delivery of fetus and ends with expulsion of placenta and membranes it also involves the control of bleeding [2]. Cesarean section done in late stage of active phase of labour has been associated with increased incidence of complication like increased blood loss, extension of uterine incision, Increased operative time, bladder injury, puerperal pyrexia, difficulty in extracting the impacted fetal head. The major indication for cesarean section done in active phase of labour are labour dystocia which could be due to arrest in dilatation or arrest in descent and abnormal fetal heart rate pattern [3]. According recent guideline ACOG recommends active phase of labour from 6 cmdilatation to complete dilation [4]. Abnormal labor refers to a deviation in the progression or duration of labor from that observed in women who have a normal, course of labour [5]. In most cases, no signs or symptoms alert the birth attendant to impending arrest or protraction disorder of labor. Diagnosis of protracted labor or arrest disorder is made based on a deviation in progression or duration of active labor at term from established norms [6]. Complications of protracted labor or arrest disorder may affect both the pregnant patient which includes endometritis, amnionitis, postpartum hemorrhage and also the neonate like decreased Apgar scores, infection). During such instances women are usually taken for a emergency cesarean section.

**MATERIAL AND METHODS**

**Study design:** This is a observational study

**Study population:** Patients undergoing cesarean section in active phase of labour.

**Study tool:** Pre-designed, Pre-tested validated semi-structured proforma was used to record the findings and the confidentiality of the data and results had been assured to the patients.

**Inclusion Criteria:** Women undergoing cesarean section in active phase of labour with

1. Singleton pregnancy
2. Vertex presentation
3. Completed 37 weeks
4. True labor pain both spontaneous and induced

**Exclusion Criteria:** Women undergoing cesarean section with

1. Previous LSCS
2. Malpresentation
3. Antepartum haemorrhage
4. Preterm labour

## RESULTS

**Table 1: Distribution of age among the study participants (N=200)**

S.no	Age	Frequency	Percentage
1	18-20	2	1.0
2	21-25	114	57.0
3	26-30	78	39.0
4	31-35	6	3.0

Mean age of the study participants were  $25.34 \pm 2.71$  years with a range of minimum 18 years and a maximum of 35 years. Majority of them were in the age group of 21 to 25 years (57%) followed by 26-30 years (39%).

**Table 2: Distribution of Obstetric score among the study participants (N=200)**

S.no	Obstetric score	Frequency	Percentage
1	Primi gravida	124	62.0
2	Second gravida	46	23.0
3	Multi gravida	30	15.0

According to obstetric score majority of them were Primi (62%) followed by 23% with second gravida, 15% with multigravida.

**Table 3: Distribution of indication for c-section among the study participants (N=200)**

S.no	Indication for c-section	Frequency	Percentage
1	Fetal distress	62	31%
2	Labour dystocia	138	69%

In our study, Indication for emergency cesarean section was maximum with labour dystocia (69%) followed by fetal distress (31%)

**Table 4: Distribution of causes of Labour dystocia among the study participants**

		LABOUR DYSTOCIA	
S.No	Dilatation of cervix	Arrest in descent	Arrest in dilatation
1	4-6cm(n=69)	22(31.8%)	47(68.2%)
2	6-8cm(n=60)	28(46.6%)	32(53.4%)
3	8-10cm(n=9)	9(100%)	0

In our study, the major indication for emergency cesarean section was labour dystocia due to arrest in dilatation at 4-6cm dilatation (68.2%), followed by arrest in dilatation at 6-8cm dilatation (53.4%) and arrest in descent at 6-8cm dilatation.

Table 5: Association between parity and indication with the degree of cervical dilatation at the time of cesarean section (N=200)

S.No	Dilatation of cervix	Indication	Primi gravida n=124	Second gravida n=46	Multi gravida n=30	P
1	4-6 cm (n=76)	FD	3(2.4%)	2(4.3%)	2(6.5%)	0.401NS
		LD	46(37%)	14(30.4%)	9(30%)	
2	6-8 cm (n=69)	FD	6(5.0%)	2(4.3%)	1(3.3%)	0.785NS
		LD	33(26.6%)	16(34.7%)	11(37%)	
3	8-10cm (n=55)	FD	31(25%)	10(22%)	5(16.6%)	0.630NS
		LD	5(4%)	2(4.3%)	2(6.6%)	

FD-Fetal distress, LD-Labour dystocia.

In our study, Majority of the pregnant females had cervical dilatation of about 4 to 6 cms (38%) followed by 6 to 8cm (34.5%) and 8-10cm (27.5%) respectively.

Table 6: Prevalence of medical disorders among the study population complicated and uncomplicated pregnancy (N=200)

	Frequency	Percentage
Medical disorder Complicating Pregnancy	87	43.5%
Pregnancy with no medical disorder complication	113	56.5%

In our study, 43.5% were medical disorder complicating pregnancy which was taken up for emergency cesarean section while 56.5% were pregnancy with no medical disorder complication undergone emergency cesarean section in active phase labour.

Table 7: Distribution of various medical disorders complicating pregnancy among the study participants

S.no	Medical disorder history	Frequency	Percentage
1	Anemia complicating pregnancy(Treated)	43	21.5%
2	Diabetic complicating pregnancy	25	12.5%
3	Hypertensive disorders	19	9.5%
4	Nil	113	56.5%

In our study, 56.5% didn't have any medical disorder complicating pregnancy whereas 21.5% had anaemia complicating pregnancy, 12.5% had diabetes complicating pregnancy and 9.5% had hypertension complicating pregnancy.

Table 8: Distribution of medical diseases among the primi gravida, second gravida and multi gravida.

	Primi gravida	Second gravida	Multi gravida
Anemia complicating pregnancy	21(16.93%)	12 (26.08%)	10 (33.33%)
Diabetic complicating pregnancy	15 (12.09%)	5(10.86%)	5(16.6%)
Hypertension	12(9.67%)	4 (8.69%)	3 (10%)
Nil	76 (61.29%)	25(54.34%)	12 (40%)
<b>Total</b>	124	46	30

In our study among primi 16.93% had anemia followed by 12.09% diabetes and 9.67% hypertension. Among second gravida 26.08% had developed anemia, 10.8% diabetes and 8.69% hypertensive. Among multi gravida mothers 33.3% had anemia complications followed by 16.6% diabetics and 10% with hypertension.

Table 9: Distribution of overt diabetes and gestational diabetes among study participants based on their parity.

Diabetic(N=25)	Primi	Second gravida	Multi gravida
<b>Overt DM</b>	3 (20%)	2 (40%)	5 (100%)
<b>GDM</b>	12 (80%)	3 (60%)	0
<b>Total</b>	15	5	5

In our study among primi gravida 20% had overt DM followed by 80% who had GDM. Among second gravida 40% had overt DM, 60% had GDM. Among multi gravida mothers 100% had overt DM.

Table 10: Distribution of study participants according to their parity and hypertensive history (N=200)

Hypertension(N=19)	Primi	Second gravida	Multi gravida
Chronic hypertension	0	1 (25%)	1 (33.33%)
Chronic hypertension + Pre eclampsia	0	2(50%)	2(66.66%)
Pre eclampsia	12(100%)	1 (25%)	0
<b>Total</b>	12	4	3

In our study among primi gravida 100% who had pre eclampsia. Among second gravida 25% had chronic hypertension followed by 50% who had chronic hypertension with pre eclampsia and 25% had pre eclampsia. Among multi gravida mothers 33.33% had chronic hypertension followed by 66.66% with both chronic hypertension and preeclampsia.

Table 11: Distribution of study participants according to their parity and mode of labour onset (N=200)

	Primi gravida	Second gravida	Multi gravida
Spontaneous	86(69.35%)	34(73.91%)	22(73.33%)
Induced	38(30.64%)	12(26.08%)	8(26.66%)
<b>Total</b>	124	46	30

In our study whereas 69.35% of primi gravida had spontaneous onset of labour followed by 30.64% had induced labour. Among second gravida 73.91% had spontaneous onset of labour followed by 26.08% had induced labour. Among multi gravida mothers 73.33% had spontaneous onset of labour followed by 26.66% had induced labour.

Table 12: Distribution of study participants according to their intra-operative complications during c-section (N=200)

S.no	Complications	Frequency	Percentage
1	Bladder drawn up	23	11.5%
2	Hematuria	9	4.5%
3	Lower uterine segment tear and angle extension	21	10.5%
4	Uterine atony	17	8.5%
5	Nil	130	65%

Intraoperative complications during c-section were reported. Among which bladder drawn up was seen in 11.5%, lower uterine segment tear, angle extension in 10.5%, uterine atony in 8.5%, hematuria in 3.5%

Table 13: Incidence of PPH among study participants (N=200)

S.no	PPH	Frequency	Percentage
1	Atonic PPH	17	8.5%
2	Traumatic PPH	3	1.5%
3	Absent	180	90%

Post partum hemorrhage was seen in 10% of the study participants.

Table 14: Requirement of blood transfusion among study participants

S.no	Blood transfusion	Frequency	Percentage
1	Yes	3	1.5
2	No	197	98.5

Out of 200 pregnancies, Blood transfusion was indicated in three patients.

Table 15: Incidence of puerperal sepsis among study participants (N=200)

S.no	Puerperal sepsis	Frequency	Percentage
1	Present	13	6.5
2	Absent	187	93.5

Puerperal sepsis was reported in 6.5% of the c-section pregnancies

**Table 16: Number of days of hospital stay among study participants (N=200)**

S.no	Hospital stay days	Frequency	Percentage(%)
1	6	48	24.0
2	7	40	20.0
3	8	37	18.5
4	9	43	21.5
5	10	32	16.0

Average duration of hospital stay was about  $7.86 \pm 1.41$  days with a range of minimum 6 days to maximum of 10 days.

**Table 17: Incidence of wound infection among study participants (N=200)**

S.no	Wound infection	Frequency	Percentage
1	Present	5	2.5
2	Absent	195	97.5

Wound infection was reported in 2.5% of the pregnancies.

**Table 18: Distribution of birth weight among study participants (N=200)**

S.no	Weight of the baby	Frequency	Percentage
1	< 2.00	2	1.0
2	2.00-2.50	8	4.0
3	2.51-3.00	94	47.0
4	3.01-4.00	96	48.0

Average weight of baby delivered was  $3.012 \pm 0.352$  kg with a range of minimum of 1.92 kg and a maximum of 3.70 kgs. Majority of babies had a birth weight of 3.01 to 4.00 (48%) followed by 2.51 to 3.00 kg (47%). Around 4% of the babies had a weight between 2.00-2.50 and 1% having less than 2 kgs.

**Table 19: Distribution of APGAR Score at 1 minute among study participants (N=200)**

S.no	APGAR Score 1 min	Frequency	APGAR Score 5min	Frequency
1	4	2 (1%)	6	4 (2%)
2	5	3 (1.5%)	7	2 (1%)
3	6	1 (0.5%)	9	194 (97%)
4	8	194 (97%)		

Average Apgar score at 1 minute was 7 with a range of minimum of 4 score to maximum of 8 score. Most of the babies had a apgar score of 8 (97%).

Average Apgar score at 5 minute was 8 with a range of minimum of 6 score to maximum of 9 score. Most of the babies had a apgar score of 9 (97%).

**Table 20: Distribution and requirement for NICU admission among study participants (N=200)**

S.no	NICU admission	Frequency	Percentage
1	Required	6	3.0
2	Not required	194	97.0

NICU admission was indicated in 3% of the babies in our study.

## DISCUSSION

Mean age of the study participants were  $25.34 \pm 2.71$  years with a range of minimum 19 years and a maximum of 33 years. Majority of them were in the age group of 21 to 25 years (57%) followed by 26-30 years (39%). According to parity majority of them were Primi gravida (62%) followed by second gravida (23%) and multi gravida (15%). Parity and Cervical dilatation in the study participants at time of cesarean section: Majority of the pregnant females had cervical dilatation of about 4 to 6 cms (38%) followed by 6 to 8cm (34.5%) and 8-10cm (27.5%) respectively. (4-6 cm dilatation chi-square-1.825, p value-0.4016, 6-8 cm dilatation chi-square-0.4824, p value-0.7857 and at 8-10 cm dilatation chi square 0.9242, p value- 0.6300). There was no statistically significant association between parity and degree of cervical dilatation at the time of cesarean section identified in our study [7]. the major indication for emergency cesarean section was labour dystocia due to arrest in dilatation at 4-6cm dilatation (68.2%), followed by arrest in dilatation at 6-8cm dilatation (53.4%) and arrest in descent at 6-8 cm dilatation. Labour dystocia as the indication is statistically significant associated with cesarean section done in active phase of labour (chi square analysis-15.76, p value 0.0003788 ). In our study anemia(33.33%) and

diabetes(16.6%) is more common among multi gravida, whereas hypertension was more frequent in primi gravida (9.67%) [8]. Maternal medical disorder considered as a single entity is not significantly associated with cesarean section done in active phase of labour (chisquare-6.167, p value- 0.4048). Overt Diabetes Mellitus and Gestational Diabetes Mellitus with respect to parity is statistically significant in cesarean section done in active phase of labour (chi square-10, p value-0.006738). Chronic hypertension, pre eclampsia, chronic hypertension with pre eclampsia with respect to parity is significantly associated with cesarean section done in active phase of labour (chi square-15.53, p value-0.003721). Induced labour with respect to parity is significantly associated with cesarean section done in active phase of labour rather than spontaneous labour. (chi-quare-8.2, p value-0.041) Majority of babies had a birth weight of 3.01 to 4.00 (48%) followed by 2.51 to 3.00 kg (47%). Around 4% of the babies had a weight between 2.00-2.50 and 1% babies were weighing less than 2 kgs. Average APGAR score at 1 minute was 7 with a range of minimum of 4 score to maximum of 8 score. Most of the babies had a apgar score of 8 (97%). Average Apgar score at 5 minute was 8 with a range of minimum of 6 score to maximum of 9 score. Most of the babies had a apgar score of 9 (97%).

### CONCLUSION

In conclusion, this study suggests that women undergoing cesarean section in the late active phase of labour are associated with intra operative maternal complications and post operative maternal morbidities and neonatal morbidities requiring special care. Hence these complications can be reduced by careful clinical assessment, monitoring the progress of labour by partogram and timely intervention.

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