

Research Article

Comparative Study of Caesarean Section in First Stage of Labour and Second Stage of Labour

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Abstract

Background: Caesarean section is defined as the birth of foetus through abdominal and uterine incision after the period of viability. As medical science has evolved there has been an increase in the rate of caesarean section globally and thus there is a need for a better understanding of the indications and outcomes of it.

Aims and objectives: Comparative study of Caesarean Section in First Stage of Labour and Second Stage of Labour and to find out related complications while comparing the two groups. Strategies to reduce maternal and neonatal complications.

Materials and methods: A hospital based observational study was conducted with 70 patients to compare caesarean section in the first stage and second stage of labour. The patients were allocated into the following two groups having 35 patients in each group:

Group 1 - Caesarean delivery in the first stage of labour

Group 2 - Caesarean delivery in the second stage of labour

Results: It was observed in our study that the mean cervical dilatation of cervix at delivery, duration of operation, duration of hospital stay, maternal and neonatal morbidities were significantly greater in group 2 as compared to group 1.

Conclusion: Caesarean sections in the second stage of labour have increased maternal and fetal morbidity and therefore require special care and should be handled and operated on by experienced obstetricians. The rate of complications can be avoided by antenatal care, pelvic assessment in early labour, and timely intervention.

Keywords: Maternal morbidity; Neonatal complications; Caesarean section

Abbreviations

OPD: Out Patient Department; IPD: In Patient Department; ANC: Antenatal Checkup; USG: Ultrasonography; PPH: Postpartum Haemorrhage; APGAR: Appearance Pulse Grimace Activity Respiration; SD: Standard Deviation; WHO: World Health Organization

Introduction

Every effort should be made to provide caesarean sections to women in need rather than striving to achieve a specific rate -WHO Statement (2015).

Caesarean section is probably the most common surgical procedure carried out in the field of obstetrics in both industrialized and low-income countries [1]. It is defined as the birth of foetus through abdominal and uterine incision after the period of viability. Caesarean section circumvents the birth canal and may avoid some of the consequences of a difficult birth. Indications for caesarean delivery have been changing over the last few years as they have become safer

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due to improved anesthesia techniques, the advent of powerful and effective antibiotics, availability of blood transfusion facilities, and improvement in surgical techniques and operative skills and neonatal care. In 2012, about 23 million caesarean sections were done globally. In recent years, several factors have been contributing to the rising caesarean rate. Elderly primiparae and the associated risk factors are often cited as a reason for the rising caesarean delivery rate [2,3]. There has been an increase in caesarean sections due to maternal request which also plays a role in the rising rate of caesarean sections. A WHO study showed that caesarean section is a surgical procedure that is associated with adverse maternal and fetal outcomes, and therefore a caesarean section should only be performed when benefits are more than risks. For the same reason, caesarean section should not be considered as an alternative to vaginal delivery. The overall caesarean section rate in India in 2005-2006 was 8.5% which increased to 17.2% in 2015-2016. As there is an increase in Caesarean section rate there is a need for a better understanding of the indication and outcomes of it. Caesarean section done in the second stage of labour is a more challenging surgical procedure and has adverse fetomaternal outcomes than performed in the first stage or before labour. Initiatives are being taken worldwide to reduce caesarean delivery rates but it is also important to evaluate if these efforts are placing mothers and babies at risk. Caesarean section being a major operation, related morbidity and complications are to be taken into consideration for safety which depends upon many factors. One important factor is the timing of caesarean section when it is performed i.e., elective, first stage or second stage. Hence the present study was done at our tertiary care centre to compare complications of Caesarean Section in First Stage and Second Stage of Labour and the strategy to reduce maternal and neonatal complications.

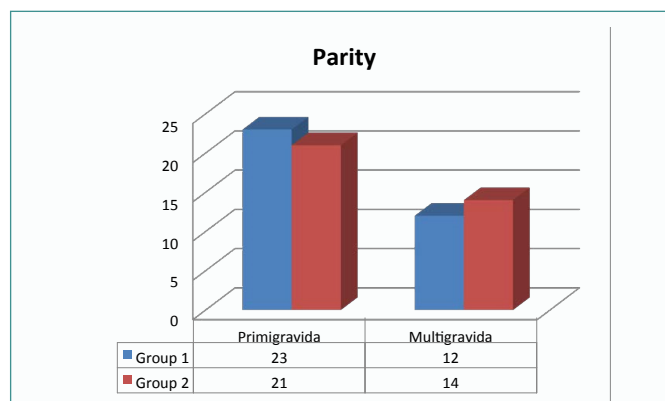


Figure 1: Distribution of patients according to Parity. The mean of parity between the groups were comparable with a p value of >0.05 .

Material and Methods

A hospital based observational study was conducted with 70 patients to compare caesarean section in the first stage and second stage of labour. The patients were allocated into the following two groups having 35 patients in each group:

Group 1 - Caesarean delivery in the first stage of labour.

Group 2 - Caesarean delivery in the second stage of labour.

Study design: A hospital based observational study.

Study duration: September 2018 to August 2020.

Study area: The study was done at our tertiary care centre in the department of Obstetrics and Gynaecology, Sample size: 70 patients.

Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune on attending OPD/IPD.

Study population: All Singleton term pregnancies between 21-35 years of age attending OPD/IPD of our Tertiary care Hospital who fulfilled the inclusion criteria.

- Group 1 - Caesarean delivery in the first stage of labour
- Group 2 - Caesarean delivery in the second stage of labour

Inclusion Criteria

1. Willing and able to provide written informed consent.
2. Singleton pregnancy between 21-35 years of age
3. Patients with term pregnancies
4. All ANC patients with history, clinical, & USG findings suggestive of normal findings
5. Patients who have come for regular ANC check ups
6. No risk factor for normal delivery detected

Exclusion Criteria

1. Age <19 years and >35 years
2. Premature rupture of membranes
3. Antepartum haemorrhage
4. Fetal growth restriction

5. Gross congenital anomalies
6. Rh incompatibility
7. With known medical disorders (Chronic Hypertension, Diabetes mellitus, heart disease) that may need preterm delivery.
8. Patients with USG scan suggesting anomalies
9. No previous caesarean section and hysterotomy
10. Any risk detected either by clinical findings or investigations for normal delivery.

Methodology

The study was done at our tertiary care centre in the department of Obstetrics and Gynaecology, Dr. D.Y. Patil Medical College, Hospital and Research Centre, Pimpri, Pune after due permission from the Institutional Ethics Committee and Review Board and after taking Written Informed Consent from the patients. After approval from the Institutional Ethics Committee, a valid informed consent was taken. Once the patients were enrolled for the study, a thorough history and physical examination was done as per proforma. Informed consent was taken in written from patients or the patient's attendant. All Pregnant women under the study were informed about the aims of the study; a written consent was obtained. Subjects were eligible for the trial if the fetus was older than 37 weeks of estimated gestational age and if the mother is undergoing caesarean delivery during the first or second stage of labour. Maternal age, BMI, gestational age, augmentation of labour with oxytocin were recorded. Information was collected in a structured format and included demographic data, relevant obstetric data, and indications for caesarean section, maternal and neonatal complications, Induction/Augmentation of Labour were recorded. The maternal duration of hospital stay, birth weight, and the APGAR score of the new born at the 5th minute, and neonatal intensive care unit admission data along with the postoperative data were recorded. Prophylactic antibiotics were administered to all patients after clamping the umbilical cord. All the documents will be meticulously recorded including partograph which is important for statistics and research.

Observations and Results

A hospital based observational study was conducted with 70 patients to compare caesarean section in first stage and second stage of labour. The patients were allocated into the following two groups having 35 patients in each group:

Group 1 - Caesarean section conducted in the first stage of labour

Group 2 - Caesarean section conducted in the second stage of labour

Discussion

A hospital based observational study was conducted with 70 patients to compare caesarean section in first stage and second stage of labour. The patients were allocated into the following two groups having 35 patients in each group:

Group 1 - Caesarean delivery in the first stage of labour

Group 2 - Caesarean delivery in the second stage of labour

In the present study, the mean age in group 1 and group 2 was 25 years. According to our study there was no statistical significant difference between the ages of the two groups ($p>0.05$). This is similar

to the studies of Gupta N et al. [4] and Jayaram J et al. [5] study. In our study, 23 (65.7%) patients in group 1 were primigravida while 12 (34.3%) patients were multigravida and 21 (60%) patients in group 2 were primigravida while 14 (40%) patients were multigravida. No significant difference was observed between the two groups. This is comparable to the study of Gupta N et al. [4]. Also a retrospective study done by Sinha S et al. [6] found no significant difference in mean maternal age, mean period of gestation between group 1 and 2 patients (Figure 1).

In the present study, the mean dilatation of the cervix at delivery in group 1 was (5.23 cms \pm 1.63 cms) versus (9.88 \pm 1.28 cms) in group 2 which was significantly smaller in group 1 as compared to group 2 ($p < 0.05$). This is similar to Das S et al. [7] and Sinha S et al. [6] study. In our study, the mean duration of labour was significantly lesser in group 1 being (9.69 hours \pm 1.11 hours) compared to group 2 being (11.23 hours \pm 2.22 hours) ($p < 0.05$). Das S et al. [7] noted similar observations in his study.

In our study the mean duration of operation was (35.54 minutes \pm 8.25 minutes) in group 1 and (46.09 minutes \pm 14.56 minutes) in group 2 which was significantly lesser in group 1 as compared to group 2 ($p < 0.05$) hence stating that second stage caesarean sections are more time consuming. Also we observed that the mean duration of hospital stay was significantly lesser in group 1 being (8.29 days \pm 1.78 days) as compared to group 2 being (11.49 days \pm 2.74 days) ($p < 0.05$). These findings were consistent with a retrospective study of Sinha S et al. [6].

It was observed in our study that 28 (80%) and 30 (85.7%) patients in group 1 and group 2 respectively were induced/augmented. There was no significant difference between the two groups ($p > 0.05$). Similar observations were noted in the studies of Das S et al. [7], Sinha S et al. [6], and Gupta N et al. [4].

The number of patients that had uterine atonia was 2.8% in group 1 vs. 17.1% in group 2 and as a result the required blood transfusion rate was 2.8% in group 1 versus 14.3% in group 2 which was significantly lesser in group 1 compared to group 2 ($p < 0.05$). In our study the incidence of wound infection was 2.8% in group 1 versus 20% in group 2 which was significantly lesser in group 1 as compared to group 2 ($p < 0.05$). This is in concordance with the studies of Das S et al. [7], Jayaram J et al. [5], Sinha S et al. [6], Gupta N et al. [4], Gurung P et al. [8], and Sucak A et al. [9]. Second stage caesareans are associated with increased risk of postpartum haemorrhage and there is a greater need for blood transfusions and hysterectomies. Sucak A et al. [9] in a prospective observational audit study observed bladder injuries, increased blood transfusion requirement, and atonic uterus hysterectomy was significantly more frequent in women who underwent caesarean section in the second stage of the labour as compared to women undergoing caesarean section in the first stage of the labour (Tables 1-9).

The mean APGAR Score at 1 minute was 7 in group 1 and 6 in group 2 respectively while the mean APGAR Score at 5 minutes was 9 in group 1 and 7 in group 2. A significant difference between the two groups was observed ($p < 0.05$). This is similar to the studies of Das S et al. [7], Sinha S et al. [6], Gupta N et al. [4] and Jayaram J et al. [5]. It was observed in our study that 3(8.5%) neonates required NICU admission in group 1 while 15(42.8%) required NICU admission in group 2 which was significantly lesser in group 1 as compared to group 2 ($p < 0.05$). The incidence of neonatal septicemia was (5.7%)

Table 1: Distribution of patients according to Age.

Age (years)	Group 1		Group 2		p value
	Number of patients	%	Number of patients	%	
21-25 years	18	51.5%	19	54.3%	>0.05
26-30 years	13	37.1%	13	37.1%	
31-35 years	4	11.4%	3	8.6%	
Total	35	100%	35	100%	
Mean \pm SD	25.63 \pm 3.24		25.43 \pm 3.11		

The mean age between the two groups were comparable with a p value of > 0.05 .

Table 2: Distribution of patients according to Mean dilatation of cervix at delivery.

	Group 1		Group 2		p value
	Mean	SD	Mean	SD	
Mean dilatation of cervix at delivery (cms)	5.23	1.63	9.88	1.54	<0.05

The mean dilatation of the cervix at delivery was significantly smaller in Group 1 compared to Group 2 (5.23 cms \pm 1.63 cms vs. 9.88 cms \pm 1.28 cms; $p < 0.05$).

Table 3: Distribution of patients according to Duration of labour.

	Group 1		Group 2		p value
	Mean	SD	Mean	SD	
Mean duration of labour (hours)	9.69	1.11	11.23	2.22	<0.05

The mean duration of labour was significantly lesser in group 1 as compared to group 2. The p value was significant < 0.05 .

Table 4: Distribution of patients according to Duration of Operation.

	Group 1		Group 2		p value
	Mean	SD	Mean	SD	
Mean duration of operation (minutes)	35.54	8.25	46.09	14.56	<0.05

The mean duration of operation was significantly lesser in Group 1 compared to Group 2 (35.54 minutes \pm 8.25 minutes versus 46.09 mins \pm 14.56 mins; $p < 0.05$).

Table 5: Distribution of patients according to their Duration of Hospital Stay.

	Group 1		Group 2		p value
	Mean	SD	Mean	SD	
Mean duration of Hospital Stay (days)	8.29	1.78	11.49	2.74	<0.05

The mean duration of hospital stay was significantly shorter in Group 1 compared to Group 2 (8.29 days \pm 1.78 days versus 11.49 days \pm 2.74 days; $p < 0.05$).

Table 6: Distribution of patients according to Induction/Augmentation of Labour.

Induction/Augmentation of Labour	Group 1		Group 2		P value
	Number of patients	%	Number of patients	%	
Yes	28	80%	30	85.7%	>0.05
No	7	20%	5	14.3%	
Total	35	100%	35	100%	

The mean of patients induced/augmented in both the groups was comparable with a p value of > 0.05

in group 1 and (11.4%) in group 2, neonatal seizure was (2.8%) in group 1 and (5.7%) in group 2 which was comparable between the two groups ($p > 0.05$). Similar observations were noted in the studies of Das S et al. [7], Sinha S et al. [6], Gupta N et al. [4], Pergialiotis V et al. [10], Jayaram J et al. [5] and Gurung P et al. [8]. A study by Das S et al. [7] observed that the incidence of neonatal trauma in the neonates born to mothers who were operated in second stage of labour was more than the neonates born to mothers operated in first stage (5% versus 0.5%, $P < 0.05$). Twelve of the neonates (12%) born to mothers operated in the second stage of labour were admitted to the Neonatal Intensive Care Unit (NICU) compared to 3 (1.5%) neonates born to mothers operated in the first stage and the results were statistically significant ($p < 0.05$).

Table 7: Distribution of patients according to Maternal Complications.

Maternal Complications	Group 1		Group 2		p value
	Number of patients	%	Number of patients	%	
Uterine Atonia	1	2.80%	6	17.10%	<0.05
Blood transfusion	1	2.80%	5	14.30%	<0.05
Atonic PPH	2	5.70%	3	8.60%	>0.05
Uterine artery ligation	1	2.80%	3	8.60%	>0.05
Wound infection		2.80%	7	20%	<0.05

The number of patients that had uterine atonia and required blood transfusion was significantly lesser in Group 1 compared to Group 2. The incidence of atonic postpartum haemorrhage and uterine artery ligation was comparable between the two groups while the incidence of wound infection was lesser in Group 1 compared to Group 2.

Table 8: Comparison of APGAR Score of Neonates between groups.

APGAR Score	Group 1		Group 2		p Value
	Mean	SD	Mean	SD	
1 min	7.91	0.61	6.89	0.83	<0.05
5 mins	9.03	0.86	7.37	0.77	

The mean APGAR score at 1min and 5min between the groups was significant with a p value of <0.05

Table 9: Distribution of neonates according to Neonatal Outcomes.

Neonatal Outcomes	Group 1		Group 2		P Value
	Number of patients	%	Number of patients	%	
NICU Admission	3	8.5%	15	42.8%	<0.05
Neonatal septicemia	2	5.7%	4	11.4%	>0.05
Neonatal seizure	1	2.8%	2	5.7%	>0.05

Conclusion

Women undergoing caesarean section in the second stage of labour have increased maternal and fetal morbidity and require special care and should be handled and operated on by experienced obstetricians especially in developing and underdeveloped countries where fetal scalp blood sampling is not done as a routine procedure during labour. Caesarean sections in the second stage of labour has increased maternal and fetal morbidity and therefore the neonatologists should be present in every case of caesarean section performed in the second stage of labour. The rate of complications can be avoided by an improvement of antenatal care, pelvic assessment in early labour, and timely intervention. In fact, anticipation about the possibility of caesarean section in second stage of labour should be done like macrosomia, borderline cephalopelvic disproportion where one can prevent the complications by taking an early decision with counselling of the patient and relatives.

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