

## A Cross Sectional Study to Evaluate Decision to Delivery Interval in Emergency Caesarian Section at a Tertiary Care Hospital

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### Abstract:

**Background:** One of the main factors affecting maternal morbidity and mortality is the decision to delivery interval (DDI) that is, the time taken from the decision to take the patient up for caesarean section to the delivery of the fetus. **Method:** This is a retrospective observational study conducted over a period of twelve months where 370 patients were studied. **Results:** No delay was seen in 49.2% cases whereas most delay was noted after decision by obstetricians to transfer patient to OT (22.2%). **Conclusion:** In order to get favourable maternal and fetal outcome decision to delivery interval should be within 30 minutes and this can be made possible if factors like results of blood investigations and cross matching of blood can be made available on time.

**Key words:** Decision to delivery interval, Caesarean section, DDI

### Introduction:

Emergency caesarean section is an operation that is done when the life of the mother and her unborn foetus are under immediate threat.<sup>1</sup> In many developing and underdeveloped countries, the rate of maternal morbidity and mortality during caesarean section is high. Many factors play a role in this. However one of the factors influencing maternal morbidity and mortality is decision to delivery interval of the emergency caesarean section. This means that the decision to take the patient up for caesarean section upto the time of delivery of the baby could influence the outcome for the mother as well as the foetus.<sup>2</sup> Decision to delivery time includes patient and theatre preparation time, time of induction of anaesthetic drug, and skin incision to delivery interval.<sup>3</sup>

Hospitals providing obstetric care should be able to respond to obstetric emergencies within the recommended time to get the best outcome for the mother as well as the foetus.<sup>2</sup> However, delay in decision to delivery time can lead to adverse fetomaternal outcomes.

According to RCOG and ACOG the recommended decision to delivery interval is within 30 minutes.<sup>1,4</sup> DDI remains an important indicator for evaluating the quality of maternal care in emergency caesarean section.<sup>5</sup>

### Methods

A retrospective observational study was conducted in the department of Obstetrics & Gynaecology of DVVPF's Medical College & Hospital, Ahmednagar, MS, India. Mothers who delivered by emergency caesarean section during the period of February 2020 to January 2021 were included in this study. We analyzed their full medical records for the entire delivery episode from admission to discharge.

**Sample size:** 370. Sample size was calculated from openepi method. The prevalence of emergency caesarean sections in our institute would be 40% of the total caesarean section.

### Inclusion criteria:

1. Mothers who have been delivered by emergency caesarean section over the 12 months of the study

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**ISSN No. (p) :** 2348-523X, (o) 2454-1982

**DOI:** 10.46858/vimshj.8204

**Date of Published :** 17<sup>th</sup> June 2021

**Exclusion criteria:**

1. Intra uterine fetal demise. The diagnosis of fetal demise prior to presentation was made according to the judgment of the attending obstetrician first and then confirmed as absence of fetal heart rate on ultrasonography.
2. Elective caesarean section

The medical records of the patients were retrieved from the medical record department of the institute after prior permission of the ethics committee. The data was collected using the records. This included the shifting order, the anaesthesia notes for induction time, paediatrician's notes for baby delivery time and surgeon's operative notes for intraoperative findings. Time taken from decision to delivery was assessed. The reason for delay were found out using the available records and the causes were noted. An interval of more than 30 minutes was considered as delay.

The data was analyzed using descriptive statistical analysis and then the results were formulated in the form of a percentage.

**Results****Table 1:** Indication for caesarean section

| Indication       | Decision to Within 30mins | Delivery time After 30 mins | Total | Percentage (%) |
|------------------|---------------------------|-----------------------------|-------|----------------|
| Cord prolapse    | 2                         | 0                           | 2     | 0.2            |
| APH              | 16                        | 9                           | 25    | 6.75           |
| CPD              | 24                        | 30                          | 54    | 14.5           |
| Foetal distress  | 59                        | 1                           | 60    | 16.2           |
| Failed induction | 24                        | 15                          | 39    | 10.5           |
| Malpresentation  | 11                        | 7                           | 18    | 4.8            |
| Arrest           | 14                        | 6                           | 20    | 5.4            |
| Placenta previa  | 12                        | 6                           | 18    | 4.8            |
| Previous 2 LSCS  | 30                        | 28                          | 58    | 15.6           |
| Failed VBAC      | 15                        | 25                          | 40    | 10.8           |
| Others           | 14                        | 22                          | 36    | 9.7            |

Table no 1 shows the indication for caesarean section. The commonest indication was foetal distress (16.2%) followed by previous LSCS (15.6%).

**Table 2:** Level of delay

| Sr. no. | Level of delay  | No. of cases | Percentage (%) | Average DDI |
|---------|---|--------------|----------------|-------------|
| 1       | After decision by obstetricians to transfer patient to OT (>10 min is Delay)                | 125          | 33.78          | 15.6 ± 5.7  |
| 2       | Arrival of patient in preoperative room to shifting patient inside the OT (>5 min is Delay) | 5            | 1.35           | 7.2 ± 2.6   |
| 3       | Arrival of patient in OT to induction of anaesthesia (>10 min is Delay)                     | 10           | 2.70           | 14.2 ± 4.9  |
| 4       | From surgical incision to delivery of the baby (>5 min is Delay)                            | 18           | 4.86           | 9.1 ± 3.5   |

Table 2 shows level of delay. No delay was seen in 49.2% cases whereas most delay was noted after decision by obstetricians to transfer patient to OT (22.2%).

**Table 3:** Causes of delay

| Sr. no. | Causes of delay   | No of cases | Percentage (%) |
|---------|---|-------------|----------------|
| 1       | Delay in taking consent of the patient                                    | 12          | 7.59           |
| 2       | Delay in arranging the medicine   | 6           | 3.79           |
| 3       | Non availability of basic investigations ( blood group, serology status ) | 65          | 41.13          |
| 4       | Delay in cross matching of blood  | 42          | 26.58          |
| 5       | Non availability of operation theatre                                     | 3           | 1.89           |
| 6       | Anaesthesia factors   | 12          | 7.59           |

Table 3 shows causes of delay. Most cases were delayed due to non-availability of blood investigations (20.8%) like CBC, blood group, serology status causing an average delay by 60 minutes. This was mainly due to unregistered cases who did not have any previous recent investigations on admission.

**Table 4:** Outcome of Delivery

| Sr. no. | Outcome of Delivery | No of cases | Percentage (%) |
|---------|---------------------|-------------|----------------|
| 1       | Maternal Morbidity  | 2           | 0.54           |
| 2       | Fresh Still Birth   | 0           | 0              |
| 3       | APGAR <7 at 1 min   | 48          | 12.97          |
| 4       | APGAR < 7 at 5min   | 32          | 8.65           |
| 5       | Admission to NICU   | 36          | 9.73           |

Table 4 shows the maternal morbidity in 2 cases (0.54%). There were no fresh still births in our study (0%). APGAR score at 1 min of less than 7 were seen in 48 cases (12.97%) which after resuscitation and re assessment at 5 min was observed less than 7 in 32 cases (8.65%). NICU admissions were required in 36 neonates (9.73%).

There were no maternal and foetal mortality, among 370 cases those who were under study.

### Discussion

The goal of our study was to evaluate the decision to delivery interval and assess the reasons for delay in emergency caesarean sections.<sup>6</sup> Mackenzie et al reported a DDI of 27.4 minutes for emergency caesarean section, 42.9 min for fetal distress and 71.1 min for cases without fetal distress.<sup>7</sup>

In our study delay was found only in 1 case of fetal distress with a DDI of more than 30 minutes. It was found that only in 5.7% of the cases undergoing emergency caesarean section in Nigeria there was lack of delay.<sup>8</sup>

Whereas, in our study, 49.2% of emergency lower segment caesarean sections were performed with no delay that is, within 30 mins from decision to delivery time. Sayegh et al observed delay due to lack of availability of operation theatre and observed the maximum delay in shifting the patient to the operation theatre.<sup>9</sup>

Yakasai et al observed a delay of more than 30 mins DDI in 307 out of 350 cases (87%). Out of this, delay due to anaesthetic causes occurred in 41% cases, lack of theatre space (13%), lack of available blood in 8%.<sup>10</sup> In our study comparatively anaesthetic factors contributed to 7.5% of total delay and non-availability of theatre only 0.8 %.

We noted in our study that the reasons of delay in cases were non availability of basic blood investigations on time like CBC, blood group

serology, etc. We observed that 20.8% cases in our institute were delayed due to delay in reporting of blood investigations and 11.3 % of cases were delayed due to delay in cross matching of blood. Time taken in running the blood investigations and arranging for patient's blood before emergency section were the major causes of delay in DDI in our study.

No any maternal deaths or fresh still births in our study (0%). While in a study by Hughes N J et al<sup>11</sup>, observed 4.7% adverse maternal outcome in the form of maternal deaths and 3.8% fresh still births.

There were two cases of maternal morbidity, both of which were observed in patients of abruptio placentae where there was delay in caesarean section because the patients had to be given blood transfusion before the section in view of pre-existing anemia and anticipated blood loss.

APGAR score at 1 min of less than 7 were seen in 48 cases (12.97%) which after resuscitation and re assessment at 5 min was observed less than 7 in 32 cases (8.65%). Hughes N J et al<sup>11</sup> observed that APGAR <7 was seen in 23% cases at 1 min and 23.3% cases at 5 min.

NICU admissions were required in 36 neonates (9.73%), where as Hughes N J et al<sup>11</sup> observed in their study, NICU admissions were 23.6% of the neonates.

As being a tertiary care centre, most of the cases we receive are unbooked cases, where we don't have any previous patient data or high risk evaluation in hand. A lot of time is required to investigate the patients for the same, and in getting the laboratory investigations (41.13%) especially cross matching of the blood (26.58%). We also observed a delay in getting the consent from the patient's relatives for emergency LSCS.

### Conclusion

Caesarean section within 30 mins interval between decisions to delivery time can be made possible if the factors like results of blood investigations and cross matching of blood is made available on time. Ensuring that the emergency section is performed at the earliest with no delay in DDI will help us get better maternal and foetal outcome.

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