First versus second stage caesarean section: a comparison of maternal and neonatal outcomes

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ABSTRACT

Background: A retrospective study was done to compare the maternal and neonatal complications of caesarean delivery performed in the second stage compared with the first stage of labor.

Methods: This is a one year retrospective study done in a 100-bedded hospital, govt. of NCT OF Delhi, New Delhi from 1st November 2015 to 31st October 2016. Total number of deliveries in this one year duration were 1785, including both normal and caesarean deliveries. Total number of patients who underwent caesarean delivery in the first stage of labor were 159, and in 2nd stage of labor were 15 during this time period. These were designated into two groups, group 1 and group 2. These two groups were then compared in terms of maternal demographics, labor characteristics, maternal outcomes and neonatal outcomes. Numerical variables were compared between groups by calculating P-value for each variable. P-value <0.05 was considered statistically significant.

Results: Caesarean deliveries performed in the second stage were associated with increased maternal morbidity in terms of blood loss, unintended extensions, blood transfusions, prolonged hospital stay, febrile morbidity. Similarly, Neonatal morbidity was much higher in the patient who underwent LSCS in 2nd stage of labor compared to 1st stage. There was increase in neonatal complications, for e.g. –5 minute Apgar <7, NICU admissions >24 hrs, neonatal septicemia, (P-value <0.05).

Conclusions: In conclusion, present study suggests that women undergoing caesarean section in the second stage of labor have increased maternal and fetal morbidity. Therefore, selection of birthing method should be made very carefully and meticulously to decrease maternal and neonatal morbidity.

Keywords: Caesarean delivery, Neonatal septicemia, Fetal pillow

INTRODUCTION

Caesarean section (CS) is the most commonly performed major abdominal operation in women in both industrialised and low-income countries.1-3 Caesarean section rate has been rising continuously and the trend is likely to continue in future.

This increase has been a global phenomenon. The timing and rate of increase are different from one country to another. In 1970 the caesarean section rate in United Kingdom was reported to be 4.8%. The audit commission in 1997 found this rate increased to 11-18%.4 Arate of 45% was reported in Puerto Rico between 1996 and 2002.5

In Medical colleges and teaching hospitals in India the overall rate of caesarean deliveries is 24.4%.6 In a population based cross sectional study, the public, charitable and private sector hospitals had caesarean section rates of 20%, 38% 47% respectively.7 Recent data suggest that caesarean delivery in labor, is associated
with increased maternal morbidity compared with caesarean delivery with no labor.8

During the last three decades, it appears that assisted vaginal delivery such as forceps and vacuum extraction, traditionally used for arrest of descent, have been replaced by c/s during the second stage of labor.9,10 One fourth of the primary caesarean sections are reported to be performed in the second stage of the labor and are more complicated compared to the ones performed in the first stage.11,12

Caesarean section during the second stage of labor with an engaged head in generally thought to carry higher maternal morbidity, usually resulting from tearing of the lower uterine segment, extension of the uterine incision and incision of the urinary bladder. Furthermore, the delay in the decision to perform an emergency caesarean section for reasons of fetal distress puts the fetus at increased risk of developing hypoxia, thus risking brain damage that leads to varying forms of disability in its life.13

METHODS

This is a one year retrospective study done in a 100 bedded hospital, Govt. of NCT of Delhi, New Delhi from 1st November 2015 to 31st October 2016. Total number of deliveries during this period were 1785, including both normal and caesarean deliveries.

First stage of labor was defined as the period of time when there were regular contractions associated with cervical change (dilatation >4 cms). Second stage of labor was defined as the period of time from full cervical dilatation (10 cms) to delivery.

Inclusion criteria

- Singleton pregnancies > 37 weeks of POG.
- Fetus with vertex presentation
- No maternal comorbidities or associated obstetric complications such as preeclampsia, diabetes mellitus.

Total number of patients who underwent caesarean delivery in the first stage of labor were 159, and in second stage of labor were 15 during this time period. These were designated as

- Group 1- Caesarean delivery in the first stage of labor (n=159)
- Group 2- Caesarean delivery in the second stage of labor (n=15)

These two groups were then compared in terms of maternal demographics, labor characteristics, maternal outcomes and neonatal outcomes. Numerical variables were compared between groups by calculating P-Value for each variable. P value <0.05 was considered statistically significant.

RESULTS

During this one year period, total 1785 deliveries took place in our hospital, including both normal and caesarean deliveries. Caesarean section rate in our hospital was 22.63%. Out of these 404caesarean deliveries, 159 women who underwent caesarean delivery during the first stage of labor and 15 women who underwent caesarean delivery during the second stage of labor were included.

Table 1: Maternal demographics and Labor characteristics.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Group 1 (n=159)</th>
<th>Group 2 (n=15)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean maternal age</td>
<td>24.75±3.97</td>
<td>24.40±3.70</td>
<td>0.740</td>
</tr>
<tr>
<td>Mean period of gestation</td>
<td>39.24±1.38</td>
<td>39.25±1.12</td>
<td>0.978</td>
</tr>
<tr>
<td>% of nullparity</td>
<td>83%</td>
<td>73.3%</td>
<td>0.312</td>
</tr>
<tr>
<td>Mean dilatation of cervix at delivery</td>
<td>5(3-7)</td>
<td>10</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>No of patients induced/augmented</td>
<td>128</td>
<td>13</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Duration of labor (hrs)</td>
<td>9.71±2.79</td>
<td>11.13±1.88</td>
<td>&lt;0.015</td>
</tr>
<tr>
<td>Operative duration (min)</td>
<td>34.23±5.84</td>
<td>43.33±6.46</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Length of Hospital Stay (days)</td>
<td>8.11±1.83</td>
<td>11.87±5.25</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Maternal demographics and labor characteristics are well depicted in Table 1. There was no significant difference noted for mean maternal age, mean period of gestation, % of nullipara between group 1 and 2 patients. The number of women who were induced/augmented in group 1 were 128 out of 159 and 13out of 15 giving a p value of <0.001.

Mean dilatation in group 1 was 5 cms while in the group 2 was 10 cms which is significant giving a period of <0.001. Operative duration and Length of hospitalisation were significantly greater in group 2 (43.33±6.46 min, 11.87±5.25days), than group 1 (34.23±5.84 min, 8.11±1.83days), (p-value <0.001).

Maternal morbidity in both groups wascalculated and comparative analysis was done in terms of p-value (Table 2).

In Group 1 only 3% patient underwent blood transfusion where as in group 2 blood transfusions was done in 26.7% patients, thus giving a p-value of 0.004, which is significant.

Bladder high up and hematuria like complications were more commonly encountered in group 2 than group 1 (p-
Unintended extensions were significantly greater in group 2 than group 1 (p-value <0.001). Wound dehiscence and febrile morbidity were encountered more in group 2 than group 1 (p-value <0.001).

Table 2: Maternal outcomes.

<table>
<thead>
<tr>
<th>Maternal complications</th>
<th>Group 1 (n=159)</th>
<th>Group 2 (n=15)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>%</td>
<td>Frequency</td>
</tr>
<tr>
<td>Atonic PPH</td>
<td>8</td>
<td>5.0</td>
<td>3</td>
</tr>
<tr>
<td>Uterine artery ligation</td>
<td>1</td>
<td>0.6</td>
<td>1</td>
</tr>
<tr>
<td>Blood transfusions</td>
<td>5</td>
<td>3.1</td>
<td>4</td>
</tr>
<tr>
<td>Bladder high up</td>
<td>2</td>
<td>1.3</td>
<td>6</td>
</tr>
<tr>
<td>Hematuria</td>
<td>3</td>
<td>1.9</td>
<td>5</td>
</tr>
<tr>
<td>Unintended extensions</td>
<td>3</td>
<td>1.9</td>
<td>6</td>
</tr>
<tr>
<td>Wound dehiscence</td>
<td>6</td>
<td>3.8</td>
<td>5</td>
</tr>
<tr>
<td>Febrile morbidity</td>
<td>6</td>
<td>3.8</td>
<td>5</td>
</tr>
</tbody>
</table>

Neonatal outcomes were defined in terms of NICU admission >24 hrs, 5 min APGAR score less than 7, Neonatal sepsicaemia, Neonatal deaths etc. In the present study regarding the maternal demographics and labor characteristics, number of women who underwent induction and augmentation were definitely larger in number in group 2 than group 1 (p-value <0.05). Similar findings were reported by Asicioglu et al and Das S.14,15 Maternal morbidity as reported by Allen VM, Asicioglu et al, Sucak A, Rabiu KA is greater in group 2 than group 1.14,16-18

Caesarean delivery performed in the second stage of labor increases the incidence of fetal injury, sepsicaemia, NICU admissions and fetal deaths due to fetal head impaction into the maternal pelvis, and prolonged second stage labor.

Thus, this leads to increased incidence of birth asphyxia, and decrease in 5 minute Apgar scores. This finding was similar to the studies by Allen VM, Sucak A, Rabiu KA and Radha P.16-19

A recent study by Das S demonstrated a statistically significant increase in admission to NICU, sepsicaemia, low 5 min Apgar (<3) and neonatal trauma.15

CONCLUSION

In conclusion, present study suggests that women undergoing cesarean section in the second stage of labor have increased maternal and fetal morbidity and requires special care and especially the patient who undergo cesarean section during the second stage of labor. Therefore selection of birthing method should be made carefully and meticulously to decrease maternal and neonatal morbidity.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

DISCUSSION

The present study clearly demonstrated that women who underwent caesarean delivery in the second stage of labor had significantly higher maternal and neonatal morbidity.

In Table 3: Neonatal outcomes.

<table>
<thead>
<tr>
<th>Outcomes</th>
<th>Group 1 (n=159)</th>
<th>Group 2 (n=15)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean birth weight</td>
<td>2.90±0.36</td>
<td>2.92±0.39</td>
<td>0.778</td>
</tr>
<tr>
<td>Apgar Score at 5 min</td>
<td>8.28±1.06</td>
<td>7.00±2.17</td>
<td>0.039</td>
</tr>
<tr>
<td>Apgar Score &lt;7 at 5 min</td>
<td>12 (7.5%)</td>
<td>5 (33.3%)</td>
<td>0.001</td>
</tr>
<tr>
<td>Neonatal sepsicaemia</td>
<td>7 (4.4%)</td>
<td>3 (20%)</td>
<td>0.043</td>
</tr>
<tr>
<td>Intubation not for meconium</td>
<td>1 (0.6%)</td>
<td>4 (26.7%)</td>
<td>0.0002</td>
</tr>
<tr>
<td>NICU stay &gt;24 hrs</td>
<td>13 (8.2%)</td>
<td>7 (46.7%)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Neonatal Death</td>
<td>1 (0.6%)</td>
<td>1 (6.7%)</td>
<td>0.165</td>
</tr>
<tr>
<td>Neonatal seizure</td>
<td>0 (0.0%)</td>
<td>1 (6.7%)</td>
<td>0.086</td>
</tr>
</tbody>
</table>
REFERENCES


