Risk of Adverse Maternal and Peri-Natal Outcome in Subjects with Placenta Previa with Previous Cesarean Section

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Summary: The aim of this study was to compare maternal and perinatal adverse outcomes between groups of placenta previa (PP) with and without previous cesarean section (CS). A prospective study was carried out from March 2008 to August 2009 at the department of Obstetrics and Gynecology, Hera General Hospital, Makkah, Saudi Arabia. Diagnosed cases of PP with singleton pregnancy presenting with ante-partum hemorrhage (APH) in the 3rd trimester undergoing either emergency or elective CS were included. Subjects were divided into two groups, 30 with previous CS (group A) and 27 without previous CS (group B), and the risks of adverse maternal and perinatal outcomes were compared. Data were analyzed using SPSS version 16 (SPSS Inc., Chicago, IL, USA).

One mother in group A died due to disseminated intravascular coagulation. The risk of post partum hemorrhage (PPH), blood transfusion and coagulopathy was higher in group A, (OR 4.8, 95% CI 1.5-15; p=0.008; OR 4.8, 95% CI 1.5-15; p=0.008; OR 9.5, 95% CI 1.2-81.6; p=0.03, respectively). Mean length of hospital stay (days±SD) in group A was significantly longer than that in group B (5.3±3.2 vs. 3.2±1.5, 95% CI 0.8-3.2; p=0.002). A higher risk of perinatal adverse outcome was found in group A, but the difference was not significant.

Risk of maternal morbidity was higher than that of perinatal morbidity in Group A.

Key words placenta previa, morbidity, cesarean section

INTRODUCTION

Incidence of placenta previa (PP) was reported to be 2.8/1000 among singleton and 3.9/1000 among twin pregnancies, and can present significant clinical problems because of post-partum hemorrhage (PPH) requiring multiple blood transfusions, and high risk of premature delivery [1]. The incidence of hysterectomy after cesarean section (CS) for PP was 5.3% with a higher relative risk compared to those undergoing CS without PP [2]. Furthermore, perinatal mortality rates were 3-4 times higher than in normal pregnancies [3,4]

Ante-partum hemorrhage (APH) is also a key cause of maternal and fetal mortality and morbidity among subjects with PP [5]. Various associations with PP have been identified, i.e., advanced maternal age, multiparity, previous CS, previous history of PP, smoking, maternal cocaine abuse and male sex of baby [6-9].

Perinatal mortality was high in cases of PP, i.e., 162/1000 versus 30/1000 in controls (cases without PP) and was more often associated with preterm than term deliveries. Maternal complications are secondary to maternal hemorrhage leading to hypovolemic shock. Incidence of placenta accreta is 10% in women with PP [10]; these cases are often associated with emergency hysterectomy [11].

Although the relationship between prior CS and
PP is well established [12-14], data from Saudi Arabia and the Middle East regarding maternal and neonatal outcomes related to cases with PP in the presence of a prior uterine scar is scarce, to the best of our knowledge. In this context, appropriate patient counseling regarding the risk of maternal and perinatal morbidity is imperative so that physicians as well as patients can be appropriately prepared for their deliveries. Thus we designed this study to compare maternal as well as perinatal adverse outcomes between groups of PP with and without previous CS.

MATERIALS AND METHODS

A prospective study was carried out from March 2008 to August 2009 in the department of gynecology and obstetrics, Hera General Hospital, Makkah, Saudi Arabia.

Diagnosed cases of PP with singleton pregnancy presenting with ante-partum hemorrhage in the 3rd trimester undergoing either emergency or elective CS were included in the study. Patients with APH diagnosed with abruption placenta or incidental causes of bleeding were excluded from the study. Patients were selected and divided into two groups, 30 patients with previous CS (Group A) and 27 without previous CS (Group B). Only multi-para patients were selected.

A composite adverse outcome variable was created for both maternal and perinatal adverse outcomes. The adverse maternal composite included any of the following: PPH, hysterectomy, blood transfusion, ICU admission, wound infection, operative injury (cystotomy, ureteral injury, or bowel injury), coagulopathy, prolonged hospital length of stay or death. The adverse perinatal composite included any of the following: birth <36 weeks of gestation, Apgar score <4 at 5 min, NICU admissions, respiratory distress syndrome, and death. The position of the placenta within the uterus, i.e., posterior, anterior, etc. as well as the type of previa, i.e., marginal, partial, complete, was not recorded.

Data were analyzed using SPSS version 16 (SPSS Inc., Chicago, IL, USA) and subjected to descriptive analysis. Student’s t tests were applied to measurement data after Leven’s test for equality of variance. Odd ratio with 95% confidence interval was measured for risk assessment of outcome in Group A. A p value ≤0.05 was considered to be significant.

The Institutional review board of Hera General Hospital, Makkah, granted us permission to conduct this study and we declare that we have no financial or personal relationship(s) which may have inappropriately influenced us in writing this paper.

RESULTS

The mean age within ±2 standard deviations (SD) was (insignificantly) higher in group A than in Group B (31.2±4.9 vs. 30.1±5.1 years, p=0.5). Age ranged from 23-39 years in group A, and 22-38 years in group B.

The risk of composite maternal morbidity was significantly higher in group A than group B (OR 4.1, 95% CI 1.3-12.8; p=0.02). Only one patient died in group A, due to disseminated intravascular coagulopathy.

<table>
<thead>
<tr>
<th>Complications</th>
<th>Group A (n=30)</th>
<th>Group B (n=27)</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPH</td>
<td>76.7</td>
<td>40.7</td>
<td>4.8</td>
<td>1.5-15</td>
<td>0.008</td>
</tr>
<tr>
<td>Hysterectomy</td>
<td>13.3</td>
<td>0</td>
<td>Infinite</td>
<td>0.6-infinity</td>
<td>0.1</td>
</tr>
<tr>
<td>Blood transfusion</td>
<td>76.7</td>
<td>40.7</td>
<td>4.8</td>
<td>1.5-15</td>
<td>0.008</td>
</tr>
<tr>
<td>ICU-admissions</td>
<td>10</td>
<td>3.7</td>
<td>2.9</td>
<td>0.3-29.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Wound infection</td>
<td>13.3</td>
<td>7.4</td>
<td>1.9</td>
<td>0.3-11.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Bowel Injury</td>
<td>10</td>
<td>7.4</td>
<td>1.4</td>
<td>0.2-9</td>
<td>1</td>
</tr>
<tr>
<td>Coagulopathy</td>
<td>26.6</td>
<td>3.7</td>
<td>9.5</td>
<td>1.2-81.6</td>
<td>0.03</td>
</tr>
<tr>
<td>Length of hospital Stay*</td>
<td>5.3±3.2</td>
<td>3.2±1.5</td>
<td>-</td>
<td>0.8-3.2</td>
<td>0.002</td>
</tr>
<tr>
<td>Composite Morbidity</td>
<td>76.7</td>
<td>44.4</td>
<td>4.1</td>
<td>1.3-12.8</td>
<td>0.02</td>
</tr>
</tbody>
</table>

Subject had mixed/multiple complications, Date has been presented in percentage

PPH, post partum hemorrhage; ICU, intensive care unit; OR, odd ratio; CI, confidence interval

* Data presented as mean±standard deviation, 95% CI is for mean difference
tation, while no mortality was found in group B. The risk of PPH, blood transfusion and coagulopathy was significantly higher in group A, (OR 4.8, 95% CI 1.5-15; p=0.008; OR 4.8, 95% CI 1.5-15; p=0.008; OR 9.5, 95% CI 1.2-81.6; p=0.03, respectively). Mean length of hospital stay (days ±SD) in group A mothers was significantly higher than that in group B (5.3±3.2 vs. 3.2±1.5, 95% CI 0.8-3.2; p=0.002). Regarding blood transfusions, 1-4 units of whole blood were required by 15 of 30 (50%) patients in group A, as compared with only 11 of 30 (40.7%) in group B. Five of 30 (16.7%) patients in group A required 5-8 pints of blood while 3 (10%) were given 8 pints. On the other hand, no patient required more than 4 units of whole blood in group B. (Table 1)

PPH was treated in group A by B-Lynch Suture in seven cases, as compared with three in group B. Uterine artery ligation was performed in eight patients in group A, but only three in group B. Hysterectomy was performed in four patients in group A, while no case underwent hysterectomy in group B. On the other hand, no procedures were done in four cases in group A and in 10 cases in group B.

Perinatal outcome revealed a higher risk of composite morbidity in Group A than in Group B (50% vs. 37%, OR 1.7, 95% CI 0.6-4.9; p=0.4), but the difference was not significant. Risk of perinatal mortality was also higher in group A (OR 3.2, 95% CI 0.3-33; p=0.6), but again the difference was not significant. (Table 2)

DISCUSSION

According to our findings maternal and perinatal morbidity was higher in the group having prior CS. Rouse et al. [15] reported that a high CS rate was associated with increased risk of transfusion in women with PP. Silver et al. [16], further clarified the degree to which a previous CS was associated with an increased risk of complications, e.g., need for numerous blood transfusions, operative injuries, and prolonged maternal length of stay in the hospital. In that analysis, complications were progressively increased by each additional CS a woman had received.

This relationship between cesarean delivery and PP has been previously described by multiple investigators [12-14]. However, these studies have had relatively undersized sample sizes, and the pregnancy outcomes of the patients with PP have been unclear. Nevertheless, evidence has shown that the risk of placenta accreta increases with the number of prior CS in the presence of PP. Relationship between perinatal outcomes of PP with and without prior CS remained uncertain.

In the current study we analyzed only women with PP and determined the risks of different kinds of morbidities in subjects with previous uterine scar due to CS. Although some complications, such as wound infection, ICU admissions, bowel injury, and hysterectomy were not found to have any significant association with the presence of prior CS, a relationship between prior CS and some other complications such as PPH, need for blood transfusions, coagulopathy and prolonged length of hospital stay was found.

Our results with regard to perinatal outcomes were more encouraging. Perinatal morbidity risks were also increased in subjects with prior CS but not significantly. These risks could be due to an increased risk of earlier and heavier bleeding. Our study findings were also comparable with those of Olive et al. [17], Frederiksen et al. [18], and McShane et al. [19], who re-

<table>
<thead>
<tr>
<th>Complications</th>
<th>Group A (n=30)</th>
<th>Group B (n=27)</th>
<th>OR</th>
<th>95% CI</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth &lt;36 weeks</td>
<td>40</td>
<td>25.9</td>
<td>1.9</td>
<td>0.6-5.9</td>
<td>0.4</td>
</tr>
<tr>
<td>Birth weight (grams)*</td>
<td>2431±695</td>
<td>2333±792</td>
<td>–</td>
<td>(–)287-483</td>
<td>0.6</td>
</tr>
<tr>
<td>Apgar score &lt;4 at 5 minutes</td>
<td>6.7</td>
<td>3.7</td>
<td>1.9</td>
<td>0.2-21.7</td>
<td>1</td>
</tr>
<tr>
<td>NICU admissions</td>
<td>43.3</td>
<td>29.6</td>
<td>1.8</td>
<td>0.6-5.4</td>
<td>0.4</td>
</tr>
<tr>
<td>RDS</td>
<td>43.3</td>
<td>33.3</td>
<td>1.5</td>
<td>0.5-4.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Mortality</td>
<td>10</td>
<td>3.7</td>
<td>2.9</td>
<td>0.3-29.5</td>
<td>0.6</td>
</tr>
<tr>
<td>Composite Morbidity</td>
<td>50</td>
<td>37</td>
<td>1.7</td>
<td>0.6-4.9</td>
<td>0.4</td>
</tr>
</tbody>
</table>

Subject had mixed/multiple complications, Date has been presented as percentage
NICU, neonatal intensive care unit; RDS, respiratory distress syndrome; OR, odd ratio; CI, confidence interval

*Data presented as mean±standard deviation, 95% CI is for mean difference
ported a significant rise in maternal morbidity in patients with prior CS.

CONCLUSION

Though maternal and perinatal morbidity was observed in both groups, group A accounted for more than three quarters of the increased risk of maternal morbidity and showed (non-significantly) higher perinatal complications. Health care providers should be aware of possible complications in order to provide proper counseling to their patients.

REFERENCES