

Caesarian Section for Placenta Praevia: Does Booking Status Affect Maternofetal Outcome?

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Abstract

Background: Placenta praevia accounts for significant maternal morbidity and perinatal morbidity and mortality. Despite advances in blood transfusion technique and surgical procedure, abnormal placentation still remains a difficult challenge for obstetricians. **Objective:** To determine the influence of booking status on the fetal and maternal outcome among parturients with placenta praevia that underwent caesarian delivery. **Methodology:** This was a comparative and retrospective study between booked and unbooked subjects with significant placenta praevia that were delivered by caesarian section between January 1st 2004 and December 31st 2008 with respect to maternal and fetal outcome. **Result:** Out of 14,344 deliveries during study period, 123 cases of placenta praevia that underwent caesarian delivery were identified giving a prevalence rate of 0.86%. 49 subjects were booked while 74 were unbooked. There was no statistically significant difference between booked and unbooked cases with respect to risk factors (30.6% of booked and 23% of unbooked), $X^2(4) = 7.203$, $P = 0.126$ and the mean blood loss at surgery (870.4 ± 486.9 ml in booked versus 779.7 ± 380.96 ml in unbooked), $X^2(1) = 0.202$, $P = 0.653$. However, antepartum transfusion (12.2% booked versus 34.7% unbooked) and postpartum transfusion (51% booked versus 72% unbooked) showed statistically significant difference, $X^2(1) = 9.744$, $P = 0.002$. One maternal death occurred amongst the unbooked cases and none among the booked cases. Statistically significant differences were also noted in the apgar score at 1 minute $X^2(3) = 15.528$, $P = 0.001$ and 5 minutes $X^2(3) = 12.912$, $P = 0.005$ respectively. More babies died in the unbooked group (19) compared to two (2) in the booked mothers. **Conclusion:** Unbooked status in placenta praevia significantly increases the risk for antepartum and postpartum transfusion, is associated with higher mortality, increased preterm delivery, poorer apgar scores and higher perinatal mortality rate.

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Keywords

Placenta Praevia, Maternal Outcome, Fetal Outcome, Booking Status, Caesarian Delivery

1. Introduction

Placenta praevia is generally defined as the implantation of the placenta over or near the internal os of the cervix [1]. There are three types—namely total, partial or marginal. It is one of the main causes of vaginal bleeding in the third trimester complicating 0.3% to 0.6% of all pregnancies [2]. There is higher incidence of low lying placenta diagnosed sonographically in the second trimester which ranges from 6% - 46%; however this rate reduces to about 0.5% at delivery [3] [4].

Placenta praevia accounts for significant maternal morbidity and perinatal morbidity and mortality [5]. Although its aetiology remains speculative, several risk factors associated with this condition include advanced maternal age, multiparity, multiple gestation, smoking during pregnancy, a male fetus, previous history of placenta praevia, previous uterine scar following instrumentations, myomectomy and previous caesarian delivery [6] [7].

Mothers with placenta praevia present with painless vaginal bleeding after fetal viability but before delivery. The bleeding is usually mild and recurrent but sometimes can be massive and life threatening. Severe bleeding in placenta praevia is associated with severe maternal morbidity and sometimes mortality. This is especially so in developing countries where few women attend antenatal care, shortage of blood for transfusion and delay of operative delivery due to logistic problems [8].

Despite advances in blood transfusion technique and surgical procedure, abnormal placentation still remains a difficult challenge for obstetricians. Intrapartum haemorrhage and the need for emergency caesarian delivery or hysterectomy related to placenta accreta are main causes of maternal and fetal morbidity and mortality [9].

Evidence abounds of unique unquestionable benefit of antenatal care [10]-[12] but it would only be effective in this case if there was routine ultrasound examination on all women who attended to localize the placenta early third trimester. This will identify cases with placenta praevia and their management planned. Though women giving birth at home without antenatal care have suffered severely impaired outcome [13], recent systematic review suggested that women with low risk pregnancies can safely have fewer antenatal care visits [14].

While marginal placenta praevia could be delivered vaginally, caesarian section is reserved for some partial and total placenta praevia including any type with life threatening bleeding [15]. This study is conducted to determine the influence of booking status on the fetal and maternal outcome among parturients with placenta praevia that underwent caesarian delivery in our facility.

2. Subjects and Method

This was a retrospective comparative study between booked and unbooked subjects with placenta praevia that were delivered by caesarian section between January 1st 2004 and December 31st 2008 following ethical clearance by our institution's ethics and research committee. Significant placenta praevia is regarded as any bleeding in diagnosed cases that resulted in haemodynamic instability or bleeding according to clinical estimation that could have resulted in haemodynamic instability if left untreated.

Case records of patients that had placenta praevia delivered by caesarian section were retrieved and categorized according to booking status. Information was obtained on age, parity, booking status, risk factors like abortion, previous caesarian delivery, mode of delivery and estimated blood loss. Other data extracted include antepartum haemorrhage, post partum haemorrhage, placenta percreta, hysterectomy, apgar scores at 1st and 5th minute including perinatal outcome and maternal mortality rate.

Data were analysed using the SPSS version 11.0 (Statistical package for social sciences, Inc 2001; Chicago 111). Descriptive statistics (mean, standard deviation) were calculated for continuous variables. Proportions and percentages were calculated for categorical variables. Chi-square (non-parametric test) was appropriately used to examine the statistical significance of the differences between categorical distributions.

P-value less than 0.05 was considered statistically significant and level of confidence interval set at 95%.

3. Results

Out of 14,344 deliveries that took place during the five year study period, 123 cases of placenta previa that underwent caesarian delivery were identified giving a prevalence rate of 0.86%. 49 subjects were booked while 74 were unbooked.

Table 1 shows the age distribution and frequency between booked and unbooked cases. The mean age for booked case was 32.6 ± 4.17 years while that for the unbooked was 30.92 ± 4.99 years. All subject had caesarian delivery with 69.4% and 89.2% of booked and unbooked cases having emergency surgery respectively (**Table 2**).

Review of risk factors (**Table 3**) shows that majority of the subjects had no risk factors while previous instrumentation following termination of pregnancy was found in 30.6% of booked and 23% of unbooked patients. The differences between booked and unbooked cases with respect to risk factors was not statistically significant $X^2(4) = 7.203, P = 0.126$.

Table 4 shows that the transfusion pattern amongst the subject 34.7% of unbooked cases have ante-partum transfusion compared to 12.2% of booked. Also 74% of unbooked cases had postpartum transfusion compared to 51% of booked case. This was found to be statistically significant $X^2(1) = 9.744, P = 0.002$.

Table 5 depicts the estimated blood loss at surgery in both groups. The mean blood loss for booked cases was 870.4 ± 486.9 mls while that for unbooked cases was 779.7 ± 380.96 ml. This difference was not found to be statistically significant $X^2(1) = 0.202, P = 0.653$.

One maternal death was recorded amongst the unbooked cases while no death occurred in the booked cases. This gives maternal mortality rate of 813 per 100,000 live birth but there was no statistically significant difference between booked and unbooked cases with respect to maternal mortality rate $X^2(1) = 0.668 P = 1.000$.

The fetal outcome measures were gestational age at delivery, apgar scores @ 1st and 5th minutes and perinatal Mortality rate. The gestational age at delivery showed that only 20.4% booked cases have preterm delivery compared to 50% of unbooked cases. This is very significant as reflected in perinatal mortality result. **Table 6** shows apgar score at 1st minute between the two groups. A large of proportion babies of booked mothers have better apgar scores at first minute compared to their unbooked counterpart. $X^2(3) = 15.528, P = 0.001$. **Table 7** represent apgar score distribution at 5th minute. A large population of babies born to unbooked mothers (8.2%) had moderate asphyxia compared to 2.0% of babies delivered by booked mothers; this was found to be statistically significant. $X^2(3) = 12.912, P = 0.005$.

Table 8 represents perinatal mortality between the 2 groups. There were 2 perinatal deaths amongst booked cases giving case fatality ratio (CFR) of 4.2% while 19 deaths occurred in unbooked group with case fatality ratio of 25.7%.

4. Discussion

Placenta previa may present with life threatening vaginal bleeding that requires immediate caesarian section. In

Table 1. Age distribution amongst booked and unbooked cases.

Age	Booked	Unbooked
20 - 24	1 (2%)	8 (10.8%)
25 - 29	9 (18.4%)	14 (18.9%)
30 - 34	25 (51%)	36 (48.6%)
35 - 39	11 (22.4%)	14 (18.9%)
≥40	3 (6.1%)	2 (2.7%)
Total	49	74

Mean: Booked 32.6 ± 4.17 yrs Unbooked 30.92 ± 4.99 yrs.

Table 2. Parity distribution.

Parity range	Booked	Unbooked
1 - 3	31	42
4 - 5	15	28
>5	3	4
Total	49	74

Table 3. Risk factors distributions.

Factors	Booked	Unbooked
Termination of pregnancy	15(30.6%)	17(23.0%)
Previous caesarian section	8(16.3%)	9(12.2%)
Myomectomy	2 (4.1%)	-
Caesarian section and placenta praevia	1 (2.1)	-
None	23 (46.9%)	48 (64.8%)
Total	49 (100%)	74(100%)

$\chi^2(4) = 7.203, P = 0.126.$

Table 4. Transfusion pattern.

	Booked	Unbooked
Antepartum	6 (12.2)	25 (34.7)
Postpartum	25 (51%)	54 (74%)

$\chi^2(1) = 9.744, P = 0.002, R.R = 1.5.$

Table 5. Estimated blood loss.

Blood loss	Booked	Unbooked
<1000 ml	36 (73.5%)	57 (77.0%)
>1000 ml	13 (26.5%)	17 (23%)

Mean: Booked = 870.4 ± 486.9 ml; Unbooked = 779.1 ± 380.96 ml; $\chi^2(1) = 0.202; P = 0.653.$

Table 6. Apgar score at 1 minute.

A.S	Booked	Unbooked
Mild Asphyxia	19	17
Moderate Asphyxia	22	20
Severe	6	18
Still Birth	2	19
	47	74

$\chi^2(3) = 15.528; P = 0.001.$

Table 7. Apgar series @ 5 minutes.

A.S	Booked	Unbooked
Normal	12	12
Mild	34	34
Moderate	1	6

$\chi^2(3) = 15.528; P = 0.001.$

Table 8. Perinatal mortality in each group.

	Booked	Unbooked
Perinatal Death	2	19

Case fatality Ratio: Booked = $2/47 \times 100 = 4.2\%$; Unbooked = $19/74 \times 100 = 25.7\%$.

these cases, multiple blood transfusion and prompt surgical intervention may reduce perinatal and maternal mortality [8]. Despite easy accessibility to high quality maternity care services, some group of women chooses not to utilize it. However, the outcome of their pregnancies was poor, although delivery may finally take place in

the hospital [16].

The prevalence of placenta previa in this study was 0.86 percent which is relatively greater than that reported for earlier studies [1] [2] but lower than 1.2% among Asians reported by Tai-Ho *et al.* [7]. However, this does not reflect the true prevalence because minor cases of placenta previa that had vaginal delivery were not included. The mean age of 32.6 years and 30.92 years for booked and unbooked cases respectively is comparable to that of Fredriksen *et al.* [17]. There was no association between increasing maternal age and development of placenta previa in this study which agrees with findings of Gorodeski *et al.* [18] and Dola *et al.* [19]. This is in contrast with the findings of other workers [6] [7].

The distribution of placenta previa along parity range showed that subjects with lower parity (3 or less) comprising 31 booked and 42 unbooked (59% all together) had placenta previa. This was in contrast with findings of Ananth *et al.* [23] and Tai-Ho *et al.* [7] in which placenta previa is associated with high parity. Though majority of the subjects had no risk factors, this may be associated with higher prevalence of placenta previa amongst the low parity group. However, previous uterine scar following termination of pregnancy and caesarian delivery were seen in about half of booked and 35% of unbooked subjects. Though no statistically significant difference exist between the two groups, Tuzovic *et al.* did not find increased risk between these factors and placenta previa [20].

Since the tendency of placenta previa to bleed did not significantly correlate with the type, the need for emergency caesarian delivery was associated the presence of ante-partum haemorrhage and increasing number of bleeding episodes [21]. Differences in antepartum transfusion of 34.7% in unbooked cases compared to 12.2% of booked cases was significant ($P = 0.002$). Same also reflected in postpartum transfusion rate of 74% in unbooked versus 51% among the booked cases. This agrees with findings of Dola *et al.* [19]. However no significant difference exist between the mean estimate blood loss of 870.4 ml in booked and 779.7 in unbooked cases respectively. These values of estimated blood loss were lower than that reported by Fredriksen *et al.* [17].

Three subjects each had hysterectomy in both the booked and unbooked cases giving an incidence of 4.87%. This is higher than that reported by Tuzovic *et al.* [20]. One maternal death occurred in the unbooked subgroup while there was none in the booked patients giving rate of 0.008% which is lower than that quoted by Iyasu *et al.* [22].

While advances in obstetrics and neonatal care significantly reduced perinatal mortality associated with placenta previa, preterm delivery still remains a great problem [2] [23]. 20.4% of booked and 50% of unbooked cases had preterm deliveries respectively. The apgar scores evaluation of both groups at the one minute revealed better score among the booked than unbooked cases (Table 5) $P = 0.001$. Same findings also reflected in the 5 minutes apgar scores with 8.1% and 2% of babies born to unbooked and booked cases respectively having moderate birth asphyxia (Table 6) $P = 0.005$. The overall perinatal death was two among the booked cases compared to nineteen in the unbooked cases giving case fatality ratio of 4.2% for booked and 25.7% for unbooked cases. This was closely related to prematurity and poor apgar scores at fifth minutes having corrected for major congenital malformations which were absent in babies delivered to both group.

Gorodeski and co workers found out that perinatal death is largely associated with marginal placenta previa delivered by vaginal route but in today's condition, most of pregnancies complicated by placenta previa are delivered by caesarian section which significantly reduces perinatal mortality [24]. As a result, immediate delivery at 36 weeks gestation was advocated in cases of placenta previa to optimize the maternal and neonatal outcome [25].

Adequate and careful counseling of women with identifiable risk factors is necessary as soon as pregnancy is confirmed. This is especially important in non-compliant women with possible poor antenatal care. Careful monitoring of these high risk pregnancies is of utmost important with respect to ultrasonographic examination with exact placenta localization during second trimester of pregnancy [26].

5. Conclusion

In conclusion, unbooked status in placenta previa was identified as a higher risk subgroup with designated poorer maternal and fetal outcome. Unbooked status significantly increased the risk for antepartum and postpartum transfusion, is associated with higher mortality, increased preterm delivery, poorer apgar scores and high perinatal mortality rate. Early booking in pregnancy affords early recognition and monitoring of placenta previa which could minimize the possibility of poorer outcome in sudden massive vaginal bleeding.

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