

Maternal and Fetal Outcomes in Pregnant Women with Major Degree Placenta Previa at ESIC MC and PGIMSR

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ABSTRACT

Background and aim: Placenta previa describes a placenta implanted in lower uterine segment either on or very near the internal os (1:300 pregnancies). With an increasing rate of caesarean section, the incidence of placenta previa and its complications are increasing. Hence, we undertook the present study with an aim to identify the risks factors and to study the maternal and fetal outcomes in major degree of placenta previa.

Methods: A Prospective Observational study-January 2019 to June 2020 at ESIC MC and PGIMSR, Rajajinagar, Bengaluru, in the Department of Obstetrics and Gynaecology. Demographic profile, risk factors, preoperative, intraoperative and postoperative maternal and fetal events were recorded.

Results: Among 5000 deliveries, 37 women were diagnosed with placenta previa (0.74%). Median age 26years, multiparity [25,67%], previous caesarean section[14,37%], previous abortions[13,35%]. Major degree placenta previa (31,83%), antepartum hemorrhage (9,24%), anterior placenta previa (24, 64%). 24 (64%) underwent emergency caesarean section with a mean estimated blood loss of 1500ml. Massive transfusions were done in 2(5.4%) women with adherent placenta. Haemostatic sutures were used in 32(86.5%) women. 2 (5.4 %) underwent caesarean hysterectomy. 3(8.1%) had a near miss and needed ICU care. Mean baby weight was 2500 grams \pm 400 grams. NICU admission 13(35.1 %) was prematurity. Neonatal mortality was 2(5.4%).

Conclusion: Prudent decisions to reduce the scarring of uterus could prevent major degree of

placenta previa. Institutional delivery where there is availability of skilled multispeciality team with robust blood bank facilities is the cornerstone to avert maternal and neonatal deaths.

Keywords: Placenta previa, caesarean hysterectomy, blood transfusion, prematurity.

INTRODUCTION

Placenta praevia occurs with an incidence of 0.3–0.5% and is defined by implantation of the placenta in the lower uterine segment, thus partially or totally overlying the internal os¹. It occurs in 2.8/1000 and 3.9/1000 in singleton and twin pregnancies respectively². In the present study the proportion is 0.74% (37 women with major degree placenta praevia among a total of 5000 deliveries)

It is observed to be one of the reasons for painless bleeding in the second and third trimester of pregnancy. Placenta praevia is classified in to four types³

- Type 1 (Low lying): Major part of the placenta is in the upper segment while only the lower margin encroaches onto the lower uterine segment but not up to the os
- Type 2 (Marginal): Placenta reaches the internal os but does not cover it.
- Type 3 (Incomplete or partial central): Placenta covers the internal os when closed but not when fully dilated.

- Type 4 (central or total): Placenta completely covers the internal os even when fully dilated.

Risk factors associated with placenta praevia are multiparity, previous caesarean section, previous instrumentation during termination of abortions^{4,5}. The dreaded complication of placenta previa is massive haemorrhage requiring massive blood transfusion, surgical procedures like cervico-isthmic sutures, internal iliac artery ligation and hysterectomy, in the worst scenario leading to maternal morbidity and mortality^{4,5, 6,7,8,9}.

According to the recent National Family Health Survey (NFHS) 4, the average rate of C-section in India is 17.2 percent ranging from 5.8 percent in Nagaland to 58.0 percent in Telangana. The difference in C-section delivery from NFHS-1 to NFHS-4 shows that 7 states has CS rate that is more than 30%, eight states has CS rate in between 10 percent and 20 percent and nine states less than 10 percent. Karnataka (NFHS 4- 2015-2016) has a caesarean section rate at 23.6, with an annual average rate of increase by 8.6%^{10,11,12,13}. In the present trend with increasing rates of caesarean section which is one of the most important risk factor, the future generation of Obstetricians have to be skilled in managing the dire problems of placenta previa and the morbidly adherent placenta scenarios.

Another burden on the health system is the care of the premature baby in the neonatal intensive care unit for multiple reasons^{6,7,8,9}

At ESIC Medical College and PGIMSR, we cater obstetric services to the insured persons and their dependents and 60% of our obstetric population are labourers who cannot avail leaves during pregnancy and most of these sub groups of women who are although booked present with antepartum haemorrhage.

Hence the present study was undertaken to identify the risk factors and as a result the maternal and neonatal outcomes. Rare observation in this study was the

identification of atonicity of the upper segment of the uterus which required compression sutures along with the haemostatic sutures used to control haemorrhage in the lower uterine segment.

MATERIAL AND METHODS

1. This was a prospective observational study conducted in the Department of Obstetrics and Gynaecology of ESIC Medical College and PGIMSR, Bengaluru during the period January 2019 to June 2020.

The study was done with the following aims and objectives.

1. To identify the risk factors contributing to major degree of placenta previa.
2. To study the maternal and fetal outcomes

Inclusion criteria:

1. Women with major degree of placenta previa diagnosed by routine ultrasound antenatally.
2. Women with major degree of placenta previa diagnosed at the time of cesarean section intraoperatively
3. Women with and or without previous caesarean section, abortions with surgical interventions.

Exclusion criteria:

1. Other causes of Antepartum haemorrhage,
2. Other non obstetric causes of bleeding per vaginum viz., carcinoma cervix, cervical polyp, local trauma secondary to vulval or vaginal varicose veins and coagulopathies.

Considering the inclusion and exclusion criteria, all the 37 pregnant women with major degree of placenta previa delivered at our hospital during the study period constituted the study group from among a total of 5000 deliveries. A detailed history pertaining to their presenting complaints, demographic profile viz., age, parity and gestational age were recorded. A complete history of the present and previous obstetric history along with emphasis on the awareness of the detection of placenta

praevia in the present pregnancy was recorded. Routine general physical examination, averting a digital vaginal examination except a per speculum examination to confirm the origin of the bleeding was performed. The risk factors recorded were, age, parity, previous caesarean section, surgical interventions for abortion, malpresentations, booked or unbooked, insured person or dependent. The following observations were recorded

1. Major degree Placenta previa detected antenatally during obstetric scan or intraoperatively.
2. Cesarean section when performed was it an elective procedure or an emergency.
3. The uterine incision was on the lower segment and or extending to the upper segment.
4. Placental cut through incision if the placenta was anteriorly implanted.
5. Surgical procedures viz., haemostatic sutures on the endo-placental bed, cervico-isthmic sutures, uterine artery ligation and step wise devascularization, compression sutures for the atonicity of the upper segment, peripartum hysterectomy were noted.
6. Need for blood and blood products,
7. post operative events viz., admission to intensive care units, sepsis, need for re-laparotomy, injury to the adjacent organs, duration of hospital stay were recorded in the mother.
8. Neonatal parameters observed were the gestational age, history of steroid prophylaxis, APGAR score at the first and fifth minute, weight of the baby, reasons for transfer to NICU, perinatal sepsis and death.
9. Occurrence of respiratory distress and need for surfactant and ventilatory support were recorded in the new born. Maternal and neonatal follow up was done until discharge.

- **Sample size:** 37 Pregnant women with major degree placenta previa(32-39weeks)
- **Statistical Analysis**
- Data were entered into Microsoft Excel and statistical analysis was carried out in SPSS software version 24.0. Qualitative variables were presented as frequency and percentages. Quantitative variables were presented as mean (standard

deviation) or median (range) depending upon the distribution of data.

RESULT

The study was conducted on 37 women with major degree placenta previa (completely covering the internal os) located in the anterior or posterior wall of the uterus. Totally 5000 deliveries were conducted during a period of 18 months from January 2019 to June 2020.

Table1: Maternal Age distribution

Age groups	Number	Percentage (%)
20-24	10	27.0
25-30	16	43.2
31-35	11	29.8
Total	37	100

The age of the women ranged from 20 to 35 years with a mean age of 26.7 years. Majority (43.2%) of them were between the age group of 25- 30 years (table 1).

Table-2: Risk factors in the present and past pregnancies.

Obstetric characteristics	Number	Percentage (%)
Gravida		
Primigravida	12	32.4
Multigravida	25	67.6
Malpresentation-Breech	4	10.8
Previous LSCS (one)	14	37.8
Previous abortion undergoing uterine curettage	9	24.3
Previous abortion without uterine curettage	4	10.8
Antenatally Booked		
Yes	30	81.1
No	7	18.9

25(67.6%) were multiparous women. Maximum were para 2 (14, 37.8%). Breech presentation was observed in 4(10.8%), as the lower segment was completely occupied with placenta. Previous one lower segment caesarean section was done in 14(37.8%) of women and uterine curettage was done for abortion in 9(24.3%) of women. Therefore 25(67.6%) women had uterine scarring. 30(81.1%) of the women were booked and 18 (60%) of them were insured persons under the ESIC social security scheme and were compliant for admission and conservative management as seen in table 2.

Two women reported from the garment factory due to haemorrhage while

performing their duties. 2(5.4%) women also had associated abruption of the placenta which occupied the upper segment. Uterine contractions were recorded in 10(27.02%)

for a brief period of time and they responded to oral tocolytics for 7 days. 16(43.24%) were admitted for safe confinement.

Table-3: Maternal features with Placenta previa

Characteristics	Number	Percentage(%)
Ante Partum Haemorrhage	9	24.3
Painless bleeding		
Uterine contractions	10	27.02%
Pain abdomen and bleeding per vaginum-abruption	2	5.4
Admitted for safe confinement at 32 weeks.	16	43.24%
Diagnosis of placenta previa		
Antenatal ultrasound after 32 weeks of gestation	35	94.6
Intra-operative diagnosis	2	5.4
Degree		
Major degree- completely covering the internal os.	37	100%
Position of the placenta -Anterior	24	64.9
Posterior	13	35.1
Gestational age (weeks)		
≤34	9	24.3
≥34-≤37	6	16.2
≥37	22	59.5
Placenta Previa in previous pregnancy	1	2.7
Anemia- haemoglobin less than 10 grams /dl in the present pregnancy.	12	32.43

Confirmation of complete or major degree of placenta praevia was performed antenatally in 35(94.6%) and 2(5.4%) were intraoperative diagnosis and both were unbooked (dependents under the ESIC social security scheme) women with no obstetric ultrasound during the present pregnancy as shown in table 3.

The position of the placenta was anterior in 24(64.9%) and posterior in 13(35.1%) of the women. 9(24.3%) presented with painless recurrent bleeding per vaginum.

Gestational age group ranged from 32 weeks of gestation to 39 weeks of gestation, with maximum number 22 (59.5%) of women in the gestational age ≥37 - ≤39 weeks of gestation. 9(24.3%) were below 34 weeks of gestation followed by 6(16.2%)of women in the gestational age group between ≥34 and ≤ 37 weeks of gestation. One multiparous woman had past history of anterior placenta previa for which LSCS was done.12(32.43%) women had haemoglobin less than 10 grams /dl as shown in table 3.

Table 4: Shows the types of incision on the uterus in major degree of placenta praevia.

Types of incision on the uterus.	Number	Percentage (%)
Type		
Elective	13	35.1
Emergency	24	64.9
Incision on the uterus		
Classical incision	1	2.7
Upper segment transverse incision as lower segment was not formed.	6	16.2
Lower segment incision avoiding cutting through the placenta	6	16.2
Lower segment incision and cutting through the placenta with immediate cord clamping	24	64.9

Table-5: Intraoperative surgical procedures to arrest haemorrhage.

Management method	Number	Percentage(%)
Endo-Placental bed sutures and Cervico Isthmic sutures.	32	86.5
B-Lynch compression sutures	3	8.1
Heyman compression suture	2	5.4
Step wise Devascularisation	1	2.7
Cesarean Hysterectomy in adherent placenta	2	5.4
Repair of bladder wall as there was encroachment of the placental tissue on to the dome of bladder.	1	2.7

Elective caesarean section were performed in 13(35.1%), following steroid

prophylaxis and admitted for safe confinement. Emergency caesarean sections

were performed in 24(64.9%) women. Commonest cause for emergency caesarean section being recurrent heavy bouts of painless vaginal bleeding. Classical upper segment caesarean section was performed in 1(2.7%), as the lower segment was not well formed and increased vascularity. Transverse incision on the upper segment was inevitable, as the lower segment was not well formed, especially when the gestational age was below 34 weeks of gestation, this was noted in 6(16.2%) women. LSCS avoiding the placenta being cut was performed in 6(16.2%) women and cutting through the placenta with immediate cord clamping was performed in 24(64.9%) women as shown in table 4.

The commonest types of haemostatic sutures were the cervico-isthmic suture along with haemostatic sutures on the placental bed in 32(86.5%). It was found that in major degree of placenta praevia the upper segment would relax once the cervico isthmic sutures or step wise devascularisation were performed and to preserve the uterus a combination with either Hayman or B-Lynch sutures were also taken. In 2(5.4%) cases of adherent placenta praevia, total abdominal hysterectomy was performed, in one woman the adherent placenta was also encroaching the bladder wall at the dome and hence bladder had to be repaired as shown in table 5.

Table-6: Blood transfusion during pre-operative, intraoperative and postoperative period

Blood transfusion	Number	Percentage(%)
1-2 Packed Red Blood Cells (PRBC)	11	29.7
3-5 PRBC	1	2.7
>5 PRBC	2	5.4
Fresh frozen plasm	10	27.02%
No blood transfusion	23	62.2

Total units of packed red blood cells transfused were 38. 11(29.7%) women needed two units, 1(2.7%) needed 4 units of blood and 2(5.4%) needed 6 units and 23(62.2%) did not require PRBC. 10 units of Fresh frozen plasma was used. Average blood loss in the present study was 1500 ml.

Table-7: Maternal intraoperative and Post operative events.

Variables	Number	Percentage(%)
Complications		
Bladder Injury	1	2.7
Sepsis	1	2.7
Primary PPH	14	37.8%
Secondary PPH	1	2.7
ICU admission	3	8.1
No ICU admission	34	91.9
Hospital stay		
1-10 days	32	86.5
>10 days	5	13.5
Near miss	3	8.1
Maternal mortality	0	0

Overall postoperative complications needing ICU care were 3(8.1%). Women with adherent placenta praevia -one having bladder injury and repair and the other with high grade fever with pelvic thrombophlebitis in sepsis and the third woman had prolonged hypotension on ionotropics. Primary PPH was recorded in 14(37.8%). Secondary post partum haemorrhage was found in 1(2.54%) on the third post operative day, secondary to endometritis. She responded to broad spectrum antibiotics and oral misoprostol. 32(86.5%) of the women stayed for less than 10 days, however 5 (13.5%) women stayed for more than 10 days , reasons being for maintenance of transurethral catheter for bladder injury and one woman for treatment of sepsis. The other 3 women stayed as the newborn babies were premature and needed NICU admission for preterm care. Maternal mortality was absent; however near miss was recorded in three women as shown in table 7.

Table-8: Neonatal Outcomes: APGAR Score and Birth weight

APGAR	Mean (SD)	Median	Min-Max
1 Minute	7.5 (0.9)	8	5-9
5 Minutes	8.5 (0.9)	9	6-9
Birth weight (Kg)	Number	Percentage(%)	
<2	7	18.9	
2 - 2.5	5	13.5	
>2.5	25	67.6	
Total	37	100	

The median APGAR score was 8 and 9 at 1 minute and 5 minutes respectively. 25(67.6%) new born weighed more than 2.5 kilograms, 5(13.5%) weighed between 2 to 2.5 kilograms and 7(18.9 %) weighed less than 2 kilograms as shown in table 8.

Table-9: Neonatal outcomes

Variable	Number	Percentage (%)
NICU admission		
Yes	13	35.1
No	24	64.9
PRETERM		
Yes	15	40.5
No	22	59.5
Fetal Growth Restriction-Yes	1	2.7
Perinatal death	2	5.4
Respiratory Distress Syndrome (RDS)	6	16.2
Surfactant use	2	5.4

13(35.1 %) had admission to the NICU.15(40.5%) were preterm, among them 13 of the babies needed NICU admission for preterm care.1(2.7%) had fetal growth retardation but did not need NICU admission. There were 2(5.4%) perinatal deaths due to sepsis in one baby and extreme respiratory distress in another baby.6 (16.2%) had RDS and 5 of the babies recovered. Surfactant was used in 2(5.4%) babies as shown in table 9.

DISCUSSION

Major degree of placenta previa especially completely covering the internal os has adverse maternal and neonatal outcome. In the present study the proportion of women identified with complete placenta previa was 0.75% at ESIC Medical College and PGIMSR Bengaluru where there were 5000 deliveries in a study period of 18 months and 37 women with only major degree placenta previa, completely covering the internal os were considered. This is in subtle contrast with 0.15% ,0.51%, 0.64%, 0.7% and 1% reported by many authors ^{6,7,8,9,10} . Probably this could be due to inclusion of minor degrees of placenta previa by them.

The mean age was 32 years and majority of the women were in the age group of 25-30yrs (16, 43.2%) similar to Sorakayalapeta ⁹ et al[Mean-25.6yrs, 25-29yrs], Sarojini ⁶ et al [25-29y] , Kumari ⁸ et al [20-30y] Kollmann ⁷ et al [mean age 31y], Adere.A ¹⁰et al (mean age 30:2 ± 5:769).

12(32.4%) women were primiparous. 25(67.6%) were multiparous women. Majority were multiparous women,

similar reports have been published by many authors ranging from 4.7% to 80.2% ^{6,7,8,9,10} Only Sorakayalapeta ⁹et al reported 47% of multiparous and 53% were primiparous women. Rosenberg ¹⁴ et al reported advanced maternal age has been also associated with a slight increase in the risk of placenta praevia (OR 1.08, 95% CI 1.07–1.09) but this effect may be due to parity.

Breech presentation was observed in 4(10.8%) women. Similar experience with malpresentations like breech presentation, transverse lie and oblique lie have been reported by Kumari ⁸et al -17.14% and Sorakayalapeta ⁹et al 9.9%, probably because the lower segment is full of placenta and requires extra skill to deliver the fetus and hence reduce the haemorrhagic and neonatal complications.

Risk factors like previous one caesarean section was found in 14(37.8%) women in the present study and 8 (21.62%) of the women had second pregnancy within one year of caesarean section and previous pre labour was seen in 3(8.10%) women. Similar Cohort studies have also reported that a second pregnancy within 1 year of a caesarean section is associated with an increased risk of placenta praevia (RR 1.7, 95% CI 0.9–3.1) .Compared with vaginal birth, a previous prelabour caesarean section is associated with an increased risk of placenta praevia in the second delivery (adjusted OR [aOR] 2.62, 95% CI 1.24–5.56)¹⁵

Most of the authors reported a lesser occurrence of previous LSCS in their series ranging from 14.28% to 29.8% ^{6,7,8,9,10}

Previous uterine curettage for abortion was found in 9(24.3%) in the present study. Similarly Adere.A ¹⁰et al reported an adjusted OR [aOR] 1.5 95% CI (.98-2.25.) with p<0.05 but Sarojini ⁶ et al 7.5%, Kumari ⁸ et al 17.14%, Sorakayalapeta ⁹ 18.3%, Kolmann ⁷ et al 22.8 % reported a lesser occurrence. Therefore 25(67.6%) women had uterine scarring.

Nirmal CH¹⁶ et al reported that 56.5% of women had uterine scarring; appraising that previous scarring of the uterus is the most important factor for placenta previa.

30(80.1%) were booked antenatally and 7(18.7%) were unbooked. In the unbooked women we found a higher occurrence of morbidity like transfer to ICU for continuation of ionotrophs, need for massive blood transfusion, NICU admission for the baby. Similar experience was reported by Kumari⁸ et al where 74.2% in their series were unbooked.

Antenatally, major degree placenta previa was diagnosed in 35(94.6%) of women by ultrasonography. Intraoperatively 2(5.4%) were diagnosed and they were unbooked women. But Kumari⁸ et al and Sorakayalapeta⁹ et al reported a 100% detection of placenta previa in their series. This observation implies that in clinical situations where there is antenatal detection of major degree of placenta previa the maternal mortality is absent as in the present study or very low as reported by other authors Kumari⁸ et al and Sorakayalapeta⁹ et al.

Pain less recurrent bouts of bleeding per vaginum was noted in 9(24.3%), abruption of the placenta in the upper segment with fetal distress along with placenta previa was encountered in 2(5.4%). There was a higher occurrence of antepartum haemorrhage as reported in the literature ranging from 32% to 52.8%^{6,7,8} Because 80% of our women were booked and 70.2% were admitted for safe confinement there was a lower occurrence.

Uterine contractions were recorded in 10(27.02%) for a brief period of time which responded to oral tocolytics for 7 days and all received steroid prophylaxis. 16(43.24%) were admitted for safe confinement, similar treatment were reported by many authors^{6,17}

Previous pregnancy with complete placenta previa was noted in 1(2.7%), however a higher occurrence was noted by

Aedre¹⁰ et al -7.3% and 10.1% by Kollmann⁷ et al.

All 37(100%) women underwent caesarean section. Elective LSCS was performed in 13(35.1%), emergency LSCS was done in 24(64.9%) in the present series. The indications being a combination of recurrent bouts of heavy bleeding, along with uterine contractions and abnormal fetal doppler flow studies. Caesarean section rates ranged from 66.4% to 100% as reported by many authors^{6,8,9,10}

Classical uterine incision was made in 1(2.7%) woman as the lower segment was very vascular. In 30(81%) woman a lower segment caesarean was possible, however, we could not get a plane to separate the membranes and so cut through the placenta followed by immediate cord clamping in 24(64.9%) of the women.

These 24(64.9%) women needed more transfusions of 24 units compared to 14 units than the posteriorly placed placenta previas. Both the adherent placenta previas were anteriorly placed and had hysterectomy, similarly Jang¹⁸ et al. reports a study looking at different localizations of the placenta and found that the anterior position of the placenta increases the incidence of excessive blood loss, massive transfusion, placental accreta and hysterectomy. Jauniaux ERM¹⁹ et al also reported that in cases of anterior placenta praevia, cutting through the placenta is often associated with increased maternal bleeding.

A retrospective cohort study by Verspyck E²⁰ et al found that avoiding incision of the anterior placenta praevia after 24 weeks of gestation reduces the need for maternal blood transfusion during or after caesarean delivery.

In an attempt to control haemorrhage from the lower uterine segment a combination of cervico-isthmus sutures and multiple placental bed sutures on the anterior and posterior walls had to be taken independently in 32(86.5%) women. Sarojini⁶ et al also has mentioned a similar experience in 4.7% of women.

It was interesting to note a novel approach of combining haemostatic sutures on the lower segment as described above and the upper segment compression suture to address the atonicity in 5(13.5%) women, this observation has not been reported in earlier literature specifically, Sarojini⁶ et al do mention about B-lynch stitch in 2.8% in their series but not mentioned the reason for its use. Yoong W²¹ et al reported a combined method of B-Lynch suture and the intrauterine balloon has also been successfully used in preventing PPH in placenta praevia. Kumari⁸ et al also reported use of haemostatic sutures in 2.85% women in their series.

2(5.4%) women underwent peripartum hysterectomy due to adherent placenta praevia and bladder encroachment even after attempts to achieve haemostasis performing step wise devascularisation, similar experience is reported by Sarojini⁶ et al in 1.9% of their series. However the peripartum hysterectomy has been reported to range from 2.85%- 7.2% by many authors^{6,8,9}

Ozdemirci S²² et al reported major surgical procedures were used to treat bleeding in 3% of Placenta Praevia cases without Placental Adhesional Anomalies(PAA), whereas this was 50.3% for those with PAA. The rate of hysterectomy or arterial ligation (hypogastric, uterine, and ovarian arteries) application was 5% for a previous vaginal birth and 29% for a cesarean birth history and there was a 7.8-fold increase in major surgical procedures in the cesarean group. There was an almost 34-fold risk of the increased application of major surgical procedures to stop intrapartum hemorrhage when previa coexisted with PAA.

All women were administered spinal anaesthesia except two of the women with adherent placenta had conversion to general anaesthesia and they required almost 6 units each of blood and blood products. Similarly, a recent case-control study from the NICHD/MFMU Network Cesarean Section Registry found general

anaesthesia to be one of the main factors associated with maternal haemorrhage in women with placenta praevia by Gibbins KJ²³ et al

Total units of packed red blood cells transfused were 38. 11(29.7%) women needed two units, 1(2.7%) needed 4 units of blood and 2(5.4%) needed 6 units. 37.8% of women did require PRBC and 10 units of fresh frozen plasma were transfused in the present study, similar findings have been reported by many authors^{8,9,1}

Women having a caesarean section for placenta praevia are at increased risk of blood loss of more than 1000 ml compared with women having a caesarean section for other indications (RR 3.97, 95% CI 3.24–4.85) as reported by Thomas²⁴ et al. Aedere¹⁰ et al reported that maternal complications associated with placenta praevia. After adjusting for confounders with a backward elimination model, postpartum hemoglobin < 12 g/dl and the need for blood transfusion 1-3 units were significantly associated with placenta praevia. Women with placenta praevia are fourteen times more likely to develop anemia (AOR 14.6; 95% CI: 6.48, 32.87) after delivery due to huge blood loss that necessitated blood transfusion 1-3 units (AOR 2.7; 95% CI: 1.10, 6.53) when compared to their counterparts.

Transfer to Intensive Care unit was seen in 3(8.1%) women, none had Disseminated Intravascular Coagulation except one woman, who had secondary PPH on post operative day 3, similarly a 3.8% occurrence were reported by many authors^{6,8,9}

32(86.5%) of the women stayed for less than 10 days in the hospital, however 5 (13.5%) woman stayed for more than 10 days, reasons being for safe confinement, maintenance of transurethral catheter for bladder injury and one woman for treatment of sepsis. The other 3 woman stayed as the newborn babies were premature and needed NICU admission for preterm care. In an unmatched case control study by Aedere¹⁰ et al, 38% of the women

stayed beyond 14 days in the hospital for similar reasons.

Maternal near miss was noted in 3(8.1%). Maternal mortality was absent. Maternal near miss though was not reported by many authors (6, 8, 9), maternal death in the range of 0.9% to 2.85% of women were reported in Kumari's⁸ and Sarojini's⁶ series.

The median APGAR score was 8 and 9 at 1 minute and 5 minutes respectively in the present study. APGAR score <7 at 5 minutes was 30%, 8.57% and 10% as reported by Sarojini⁶, Kumari⁸ and Kollmann⁷ respectively. Apgar score of 9 at the 5 minutes was also noted by Kumari⁸ et al.

25(67.6%) new born weighed more than 2.5 kilograms, 5(13.5%) weighed between 2 to 2.5 kilograms and 7(18.9%) weighed less than 2 kilograms. Overall < 2.5 kilograms were 12(32.43%). Sorakayalapeta⁹ et al in her series had a lower occurrence of 20.6%. probably because 70.2% of women delivered after 37 completed weeks of gestation. Kumari⁸ et al reported a higher occurrence of baby weight <2.5 kilograms, probably because 68.57% had delivered before 37 completed weeks of gestation.

Kollman⁷ et al reported women with a "major placenta praevia" were all delivered by caesarean section and had a significant higher incidence of preterm delivery (OR=6.04, CI 3.27-11.15, p<0.01), birth-weight <2500 g (OR=3.82, CI 2.05-7.11, p<0.01) and Apgar-score after five minutes <7 (OR=6.39, CI 1.35-30.35, p<0.01 ;).

13(35.1%) neonates had admission to the NICU. 15(40.5%) were preterm, among them 13(35.1%) of the babies needed NICU admission for preterm care, similar reports were recorded by Kollman⁷ et al -75.5% and Sarojini⁶ et al had 39.7% of women. 1(2.7%) had fetal growth retardation but did not need NICU admission, similarly there is no evidence, however, that neonates born after pregnancies with placenta praevia are more

likely to be small for gestational age when compared to non-praevia controls as reported by Nørgaard LN²⁵ et al.

6(16.2%) had Respiratory Distress Syndrome and 5 of the babies recovered. Surfactant was used in 2(5.4%) babies. There were no still births in our series. Many authors have reported occurrence of still birth ranging from 3.05% to 7.5%^{6,8,9}

In an unmatched case control study by Adere¹⁰ et al, after adjusting for confounders with a backward elimination model, respiratory distress syndrome, intrauterine growth retardation (IUGR), and preterm birth were significantly associated with placenta praevia. Neonates born to women with placenta praevia have fourfold increased risk of respiratory syndrome (AOR 4; 95% CI: 1.24, 13.85), six fold increased risk of IUGR (AOR 6.3; 95% CI: 1.79, 22.38), and eightfold risk of preterm birth (AOR 8; 95% CI: 4.91, 12.90). Low birth weight, Apgar at 1 min < 7, hypothermia, and admission to NICU were not significantly associated with placenta praevia.

Steroid prophylaxis was given in 10 (27.02%) women ≤ 36 weeks of gestation to prevent RDS in the present study. Similarly, a decision analytic model designed to compare total maternal and neonatal quality-adjusted life years for delivery of women with placenta praevia at 34+0 to 36+6 weeks of gestation indicated that corticosteroids administration at 35+5 weeks of gestation followed by planned delivery at 36 weeks of gestation optimises maternal and neonatal outcomes as observed by Bose DA²⁶ et al.

There were 2(5.4%) perinatal deaths due to sepsis in one baby and extreme respiratory distress in another baby. Many authors had an observation of higher perinatal deaths ranging from 11.2% to 20%^{6,8}.

Limitations of the study: Present study does not compare the maternal and neonatal outcomes with previous vaginal deliveries with placenta praevia in the present pregnancy as a control group. Due to small

numbers a valid decision regarding change over to lighter jobs during pregnancy for women with placenta previa under the ESIC social security scheme is difficult to arrive at.

CONCLUSION

The patterns of risk factors like the advanced maternal age, increased parity, the most important one being a scarred uterus and an anterior placenta previa if associated with an adherent placenta can be disastrous in terms of extensive surgical procedures, increased transfusion of blood and blood products, need for interventions in the intensive care units, enhanced maternal near miss, maternal mortality, prematurity and its aftermath. Therefore, diagnosing a placenta previa and once a diagnosis is made the pregnant women should be advised adequate rest, maintain haemoglobin above 10 grams per dl, ascertain she delivers in a tertiary centre where there is high risk obstetric care facility. Availability of skilled Obstetricians, Anaesthesiologist, Intensivist. Paediatrician for preterm neonatal care, supported by robust blood bank facilities should be ensured. If we could reduce the primary caesarean sections for non-recurrent causes, practice the use of oral mifepristone and misoprostol in the management of first trimester abortions and not interfere with the uterine musculature, unless required, there is a possibility we can also decrease the occurrence of placenta previa and placental adhesional spectrum. Hence, saving a lot of resources expended at the ESIC Social Security organisational level venturing to save mothers and their newborns.

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