



A Comparative Study on Maternal and Fetal Outcome in Cases of Placenta Previa with Previous Cesarean Section and Without Previous Cesarean Section

Authors

Dr Simi Jameela¹, Dr Bindu Policarp², Dr Uma Thankam³, Dr Nirmala Chellamma⁴

^{1,3}Assistant Professor, ²Associate Professor

⁴Professor and Head of the Department of Obstetrics and Gynaecology
Sree Avittom Thirunal Hospital, Trivandrum

Abstract

Placenta previa is the major cause of antepartum haemorrhage that causes serious morbidity and mortality to both fetus and mother.

Objective[s]: *To compare the antepartum, intrapartum, postpartum complications in placenta previa with previous cesarean section and without previous cesarean section.*

To compare the fetal outcome in the two groups of cases of placenta previa.

Materials and Methods: *This is a case control study conducted in Sree Avittom Thirunal Hospital Trivandrum over a period of one year with diagnosed case of placenta previa with previous cesarean and without previous cesarean. During the study period out of 14164 deliveries 190 cases of placenta previa were reported. After excluding all primi and multiple pregnancies [to avoid bias] there were 58 cases in the case group and 72 cases in the control group.*

We have excluded other causes of antepartum haemorrhage and those referred as P.P.H.

Results: *Present study confirmed that APH before 37 weeks and recurrent bleeding were more in cases of placenta previa with previous cesarean than those without.*

PPH 2.78 times more in case group than the control

All cases of adherent placenta were in cases of placenta with previous cesarean. The need for additional operative procedures is around 3.58 times more in case group. Cesarean hysterectomy was needed for 5.17% of case group and none in control group. Intraoperative complication [5.6 times] and postoperative complications [3 times] more in case group. The number of babies admitted to IBN was 2.5 times more in the cases than control which is due to prematurity and associated complications.

Conclusion: *The study shows the need to reduce the primary cesarean rate to avoid future pregnancy complications like adherent placenta and cesarean hysterectomy. The occurrence of placenta previa in a patient with previous cesarean needs to be managed in a tertiary care centre with all facilities available, for a good maternal and neonatal outcome. Early referral of these patient to a tertiary care centre is always preferable.*

Keywords: *Placenta previa, previous cesarean, adherent placenta*

Introduction

The placenta previa is a major cause of vaginal bleeding in late 2nd and 3rd trimester. The incidence of placenta previa is 0.3%.¹

Classification in relation with internal os¹

Total placenta previa: the internal os is completely covered by the placenta.

Partial placenta previa: internal os is partially covered by placenta.

Marginal placenta previa: placenta at the margin of os.

Low lying placenta: implantation in the lower segment in such that the placental edge doesn't reach the os and remains outside a 2cm wide perimeter around the os.

Etiology of placenta previa is unknown. Condition may be multifactorial and postulated to be related to multiparity, multiple gestation. Advanced maternal age, previous cesarean, previous abortion and possible smoking, tumours distorting uterine cavity. Numerous studies have found that a previous cesarean increases the risk of placenta previa. The risk of adherent placenta increases to 11%, 40%, and 61% with previous one, two, three cesarean section.² Diagnosis of placenta previa and adherent placenta by trans abdominal, trans vaginal ultrasound (grey scale, colour Doppler) and MRI.³ management of placenta previa requires a team approach with high quality competent obstetrician, senior anaesthetist, neonatologist and good OT set up and ICU. Ready availability of blood and components is a must.

Women with placenta previa are at increased risk of spontaneous abortion, preterm delivery, cesarean, multiple blood transfusion and obstetric hysterectomy. There is significant perinatal mortality in placenta previa due to prematurity.⁴ certain studies showed that neonatal complications include congenital anomalies, respiratory distress syndrome and anaemia.⁵ The perinatal mortality rate with placenta previa was 2.3%.

Maternal complications associated with placenta previa are hysterectomy, antepartum haemorrhage, intrapartum and postpartum haemorrhage, need for transfusion, septicaemia and thrombophlebitis

Maternal mortality has dropped from 5% to 0.1% in developed countries with the development of improved medical care and facilities.

Materials and Methods

This is a case control study conducted by Department of obstetrics and gynaecology in our institution over a period of 1 year. Study conducted with all cases diagnosed as placenta previa from history and clinical examination and confirmed by ultrasound were taken. This is sub grouped in to 2 groups' placenta previa with previous cesarean and without previous cesarean. During the study period out of 14164 deliveries 190 cases of placenta previa were reported. After excluding all primi and multiple pregnancies(to avoid bias) there were 58 cases in the case group and 72 cases in the control group.so study group is all cases of placenta previa with previous cesarean who have delivered in Sree Avittom Thirunal Hospital. The control group is all cases of placenta previa without previous cesarean (multi gravida).exclusion criteria for both case and control are primi, multiple pregnancy, other causes of APH, cases of placenta previa delivered outside but admitted with PPH. Both groups were compared for duration of hospital stay previous obstetrics history and number previous cesarean, presenting complaints that lead to the termination of pregnancy, period of gestation at termination, history of placenta previa in previous pregnancy, history of antepartum haemorrhage in present pregnancy and in the number of episodes of antepartum haemorrhage and the precipitating factors and the treatment given were noted. Preterm babies injection corticosteroid for pulmonary maturity given or not were noted. The number of blood transfusion, maternal intapartum, and postpartum complication were noted. During cesarean type of previa was confirmed again. Occurrence of intra op complications including additional surgical procedures, adherent placenta and c s hysterectomy were noted. In the postop period wound infection, secondary PPH, sepsis, thrombophlebitis were noted. Regarding babies

IBN admission and outcome at the time of discharge were noted.

Data analysed with the help of statistician, percentage comparison done using chi square and fisher exact test. pvalue of 0.05 or less considered as statistically significant. to assess the association for certain characteristics with the case control study odds ratio were also calculated, all the computations were done by using computer package, SPSS-10

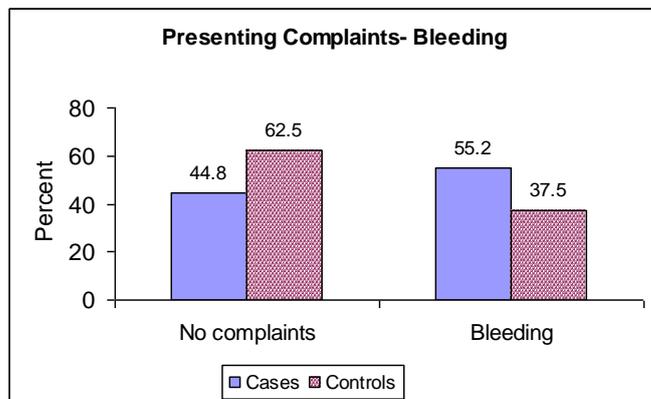
Results

In this study there were 58 cases in the study group and 72 cases in the control group.

Distribution according to presenting complaints

| | Case | Control |
|-------------------------------|------------|-------------|
| Bleeding | 27 (46.5%) | 22 (30.55%) |
| Labour pain | 3 (5.1%) | 6 (8.3%) |
| Labour pain, bleeding | 5 (8.6%) | 3 (4.16%) |
| Rupture of membrane, bleeding | 0 (0%) | 2 (2.77%) |
| On date, past date | 0 (0%) | 5 (6.94%) |
| Preeclampsia | 3 (5.1%) | 6 (8.33%) |
| Iugr, oligamnios | 1 (1.72%) | 2 (2.77%) |
| IUD | 4(6.89%) | 4 (5.55%) |
| Anomaly | 0 (0%) | 0 (0%) |
| Asymptomatic | 15(25.8%) | 22(30.5%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 3.50; P \text{ value} - 0.061; OR - 1.98$ Not significant



In both groups bleeding was the main presenting complaint that lead to termination of pregnancy but bleeding as an indication for termination of pregnancy was significantly (2 times) more in the case group.

Distribution according to Period of Gestation at Termination

| | Case | Control |
|------------|------------|-------------|
| ≤ 37 weeks | 40 (68.9%) | 30 (41.6 %) |
| > 37 weeks | 18 (31.1%) | 42 (58.4%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 9.63; P \text{ value} - 0.002; OR = 3.11$ Significant

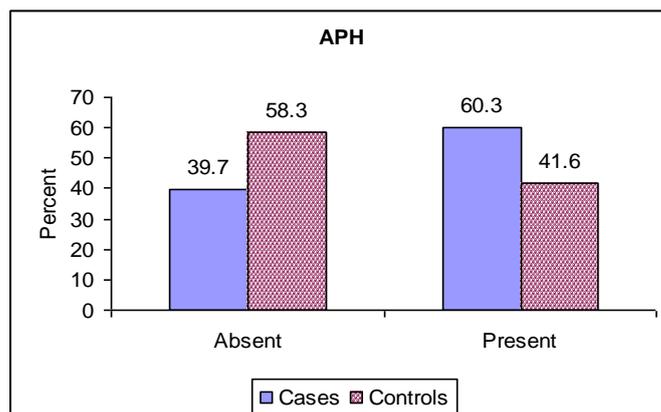
Majority terminated ≤ 37 weeks in the case group compared to control group. It was statistically significant (3 times).

Distribution according to Antepartum Hemorrhage

| | Case | Control |
|---------|-------------|-------------|
| Present | 35 (60.34%) | 30 (41.66%) |
| Absent | 23 (39.65%) | 42 (58.3%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 4.48; P \text{ value} - 0.034; OR = 2.13$ Significant

Antepartum hemorrhage was 2 times more in case group compared to the control group.



Indication for termination

| | Case | Control |
|-------------|-----------|-----------|
| Bleeding | 32[55.2%] | 27[37.5%] |
| no bleeding | 26[44.8%] | 45[62.5%] |
| Total | 58[100%] | 72[100%] |

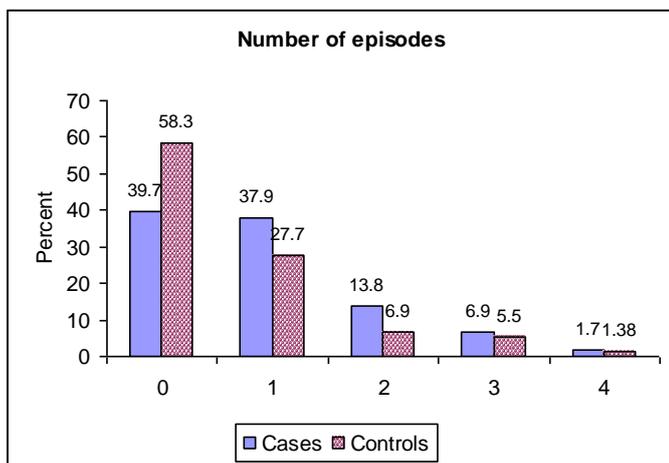
$\chi^2 - 4.05; P \text{ value} - 0.044; OR - 2.05$ significant

Distribution according to Number of Episodes of APH

| Number of episodes of APH | Case | Control |
|---------------------------|-------------|-------------|
| 0 | 23 (39.65) | 42 (58.35%) |
| 1 | 22 (37.93%) | 20 (27.7%) |
| 2 | 8 (13.79%) | 5 (6.9%) |
| 3 | 4 (6.89%) | 4 (5.6%) |
| 4 | 1 (1.72%) | 1 (1.4%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 = 4.48$; P value - 0.034; $OR = 2.13$ Significant

APH and Recurrent episodes of APH were significantly greater in the case group (2 times) compared to the control group

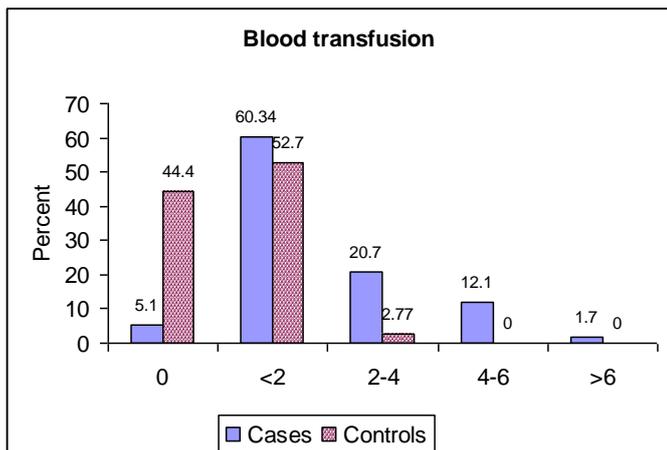


Distribution according to Blood Transfusion

| | Case | Control |
|-------|-------------|------------|
| 0 | 3 (5.1%) | 32 (44.4%) |
| < 2 | 35 (60.34%) | 38 (52.7%) |
| 2 - 4 | 12 (20.7%) | 2 (2.77%) |
| 4 - 6 | 7 (12.1%) | 0 (0%) |
| > 6 | 1 (1.7%) | 0 (0%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 25.18$; $P - 0.000$; $OR = 14.67$ Significant

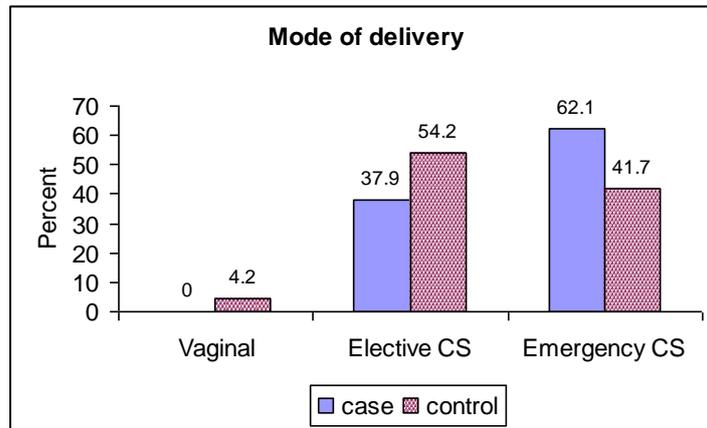
Large number of blood transfusions was needed in the case group compared to the control group which was statistically significant.



Distribution according to Mode of Delivery

| | Case | Control |
|--------------------|-------------|-------------|
| Vaginal | 0 (0%) | 3 (4.16%) |
| Emergency cesarean | 36 (62.06%) | 30 (41.67%) |
| Elective cesarean | 22 (37.93%) | 39 (54.17%) |
| Total | 58 (100%) | 72 (100%) |

Fisher's exact test - 0.253; not significant

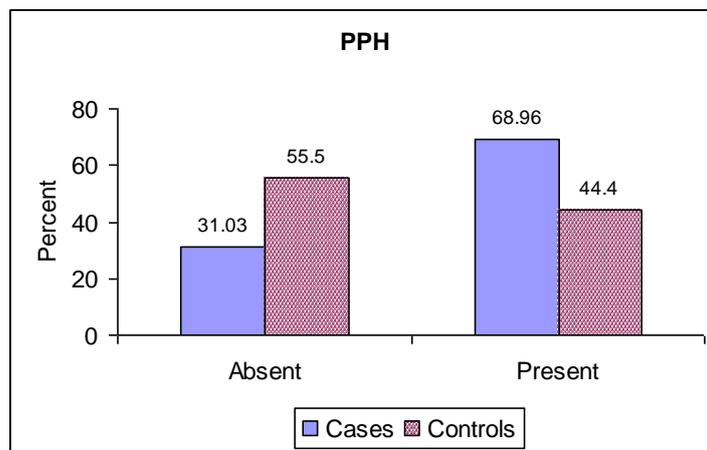


Vaginal delivery 4.16% in the control group. Emergency cesarean 62.06% in the case group compared to 43.05% in the control group. Which was statistically not significant

Distribution according to Post-Partum Haemorrhage

| | Case | Control |
|---------|-------------|------------|
| Absent | 18 (31.03%) | 40 (55.5%) |
| Present | 40 (68.97%) | 32 (44.5%) |
| Total | 58(100%) | 72 (100%) |

$\chi^2 - 7.82$; $P - 0.005$; $OR - 2.78$ Significant



PPH was significantly more in the case group (2.8 times) compared to the control group.

Distribution according to Placental Adherence

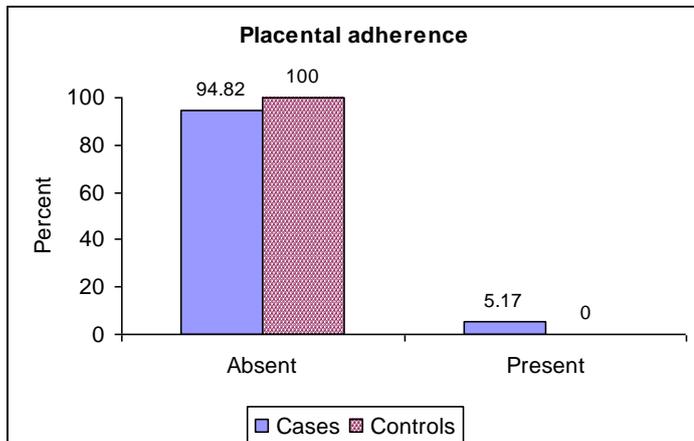
| | Case | Control |
|---------|-------------|-----------|
| Absent | 55 (94.82%) | 72 (100%) |
| Present | 3 (5.17%) | 0 (0%) |
| Total | 58 (100%) | 72 (100%) |

Because of a 'Zero'

Chi square test cannot be done

Fishers exact test P value = 0.094; OR cannot be calculated

Placental adherence were only found in case group.

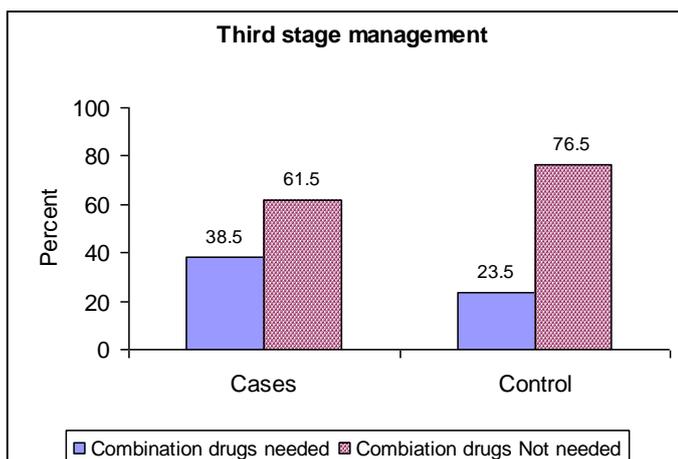


Distribution according to Third Stage Management

| | Case | Control |
|--------------------------|------------|------------|
| Combination drugs needed | 23 (38.5%) | 17 (23.5%) |
| Not needed | 35 (61.5%) | 55 (76.5%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 3.88$; $P - 0.049$; $OR - 2.13$ Significant

Use of combination drugs needed was significantly more in the case group (38.5%) compared to 23.5% in the control group. No drugs were needed in majority of control group (44.5%).



Third Stage Management

| | Case | Control |
|---------------------------|-------------|------------|
| None | 8 (13.7%) | 32 (44.5%) |
| Methergin | 22 (37.93%) | 20 (27.7%) |
| PGF ₂ α | 2 (3.44%) | 1 (1.38%) |
| PGE ₁ | 3 (5.17%) | 2 (2.77%) |
| Combined | 23 (38.5%) | 17 (23.5%) |
| Total | 58 (100%) | 72 (100%) |

Distribution according to Need for Additional Operative Procedure

| | Case | Control |
|--------------------------|------------|------------|
| No additional operations | 15 (25.8%) | 40 (55.5%) |
| Needed | 43 (74.2%) | 32 (44.5%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 11.60$; P value - 0.0006; OR 3.58 Significant

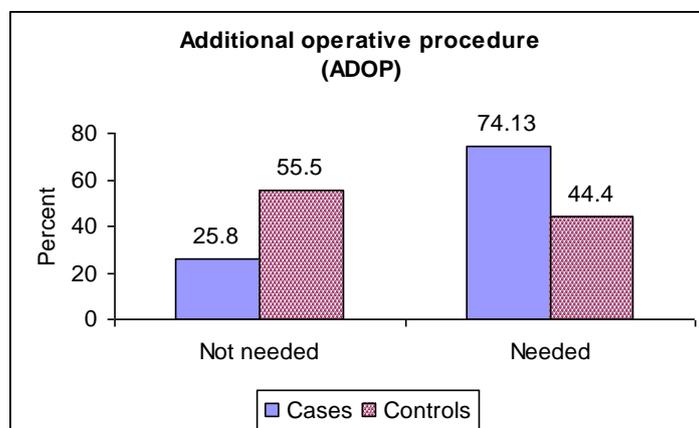
Additional operative procedures for control of PPH (3.5 times) significantly more in the case group than the control group.

Additional operative procedures

| | Case (43) | Control (32) |
|---|-----------|--------------|
| Placental bed suturing | 4 | 5 |
| Uterine artery ligation | 20 | 16 |
| Placental bed suturing, uterine artery ligation | 11 | 10 |
| Uterine artery ligation and other procedures | 8 | 1 |

Uterine artery ligation and other procedures

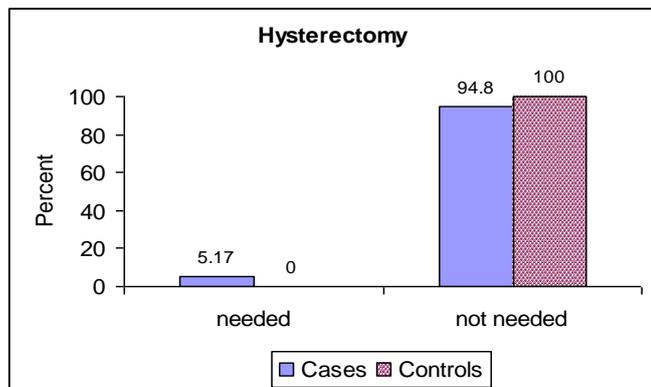
| | Case | Control |
|---------------------------|------|---------|
| Ovarian A ligation | 1 | 1 |
| Internal iliac A ligation | 3 | 0 |
| B Lynch ligation | 1 | 0 |
| C.S hysterectomy | 3 | 0 |



Distribution according to CS Hysterectomy

| | Case | Control |
|------------|------------|-----------|
| Needed | 3 (5.17%) | 0 (0%) |
| Not needed | 55 (94.8%) | 72 (100%) |
| Total | 58 (100%) | 72 (100%) |

Fisher's exact test P value - 0.086



CS Hysterectomy were only in the case group (5.17%) compared to control group which is statistically not significant due to small sample size.

One case of placenta increta and two case of placenta accreta were there all in previous one cesarean for which CS hysterectomy was done.

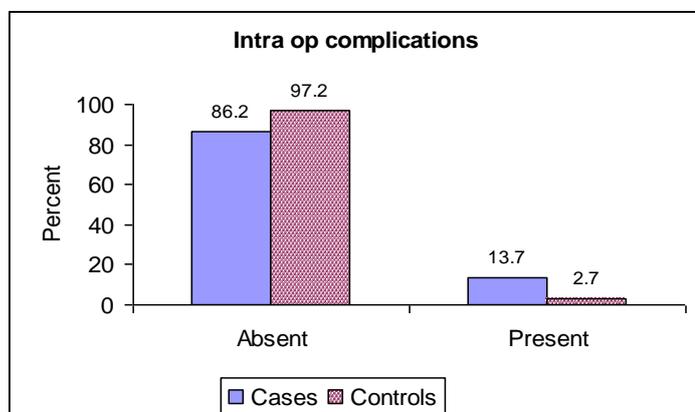
Distribution according to intra op complications

Intra op complications

| | Case | Control |
|---------|------------|------------|
| Absent | 50 (86.3%) | 70 (97.3%) |
| Present | 8 (13.7%) | 2 (2.7%) |
| Total | 58 (100%) | 72 (100%) |

Fisher's exact test P value = .023 OR= 5.60 significant

Intra op complications were significantly more in the case group (5.6 times) compared to the control group. Intra op complications are more in the case group.



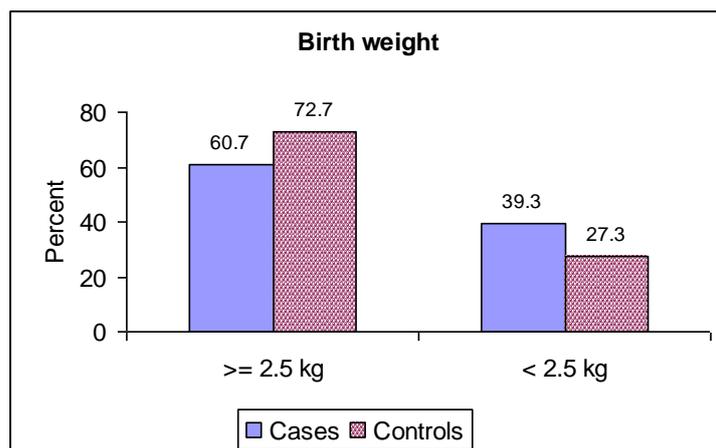
Distribution according to Birth Weight

Birth weight (kg)

| | Case | Control |
|--------|-------------|------------|
| >= 2.5 | 35 (60.34%) | 52 (72.7%) |
| < 2.5 | 23 (39.6%) | 20 (27.3%) |
| Total | 58 (100%) | 72 (100%) |

$\chi^2 - 1.72; P - 0.160; not significant$

Birth weight < 2.5 kg, 39.6% in the case group compared to 27.3% in the control group. But it was statistically not significant.



Distribution according to IBN Admissions

IBN admissions

| | Case | Control |
|-----|-------------|------------|
| No | 40 (68.96%) | 61 (84.7%) |
| Yes | 18 (31.04%) | 11 (15.3%) |

$\chi^2 = 4.60 P = .032 OR = 2.50 significant$

Number of IBN admissions were significantly more in case group (2.5 times) compared to the control group.

Distribution according to Anomalies

| Anomalies | Case | Control |
|-----------|------------|------------|
| Nil | 56 (96.5%) | 69 (95.8%) |
| Present | 2 (3.4%) | 3 (4.1%) |

Fisher's exact test P value = 1.000 not significant

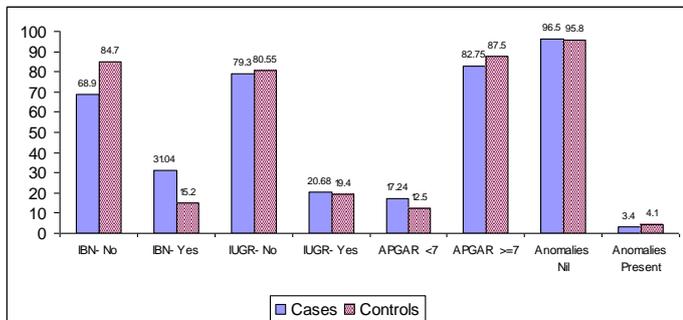
Anomalies were comparable in both groups, which was statistically not significant.

Distribution according to Apgar

| Apgar | Case | Control |
|-------|-------------|------------|
| < 7 | 10 (17.24%) | 9 (12.5%) |
| ≥ 7 | 48 (82.75%) | 68 (87.5%) |

$\chi^2 = 0.58 P = 0.447 OR = 1.46 not significant$

Apgar < 7 in 17.24% in the case group compared to the 12.5% in the control group which was not statistically significant.



Reasons for IBN Admission

| | Case (18) | Control (11) |
|---------------------------|-----------|--------------|
| Prematurity | 8 | 3 |
| RDS/ HMD | 4 | 2 |
| Birth asphyxia | 2 | 1 |
| Infant of diabetic Mother | 1 | 1 |
| MAS | 1 | 1 |
| Sepsis | 1 | 1 |
| Jaundice | 1 | 1 |
| TTN | 0 | 0 |
| HIE | 0 | 1 |

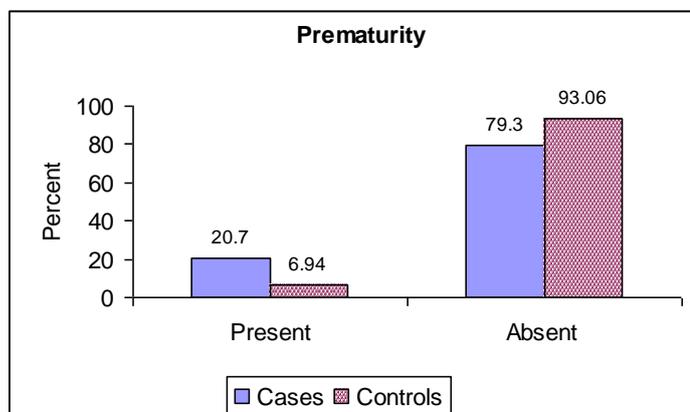
Reason for IBN Admissions

Prematurity associated cause (RDS, HMD, NEC, and ICH)

| | Cases | Control |
|---------|------------|-------------|
| Present | 12 (20.7%) | 5 (6.94%) |
| Absent | 46 (79.3%) | 67 (93.06%) |

χ^2 - 5.34; P- 0.020; OR- 3.50 Significant.

Prematurity and associated complications were more in case group (20.6%) compared to 6.94% in the control group, which was statistically significant.

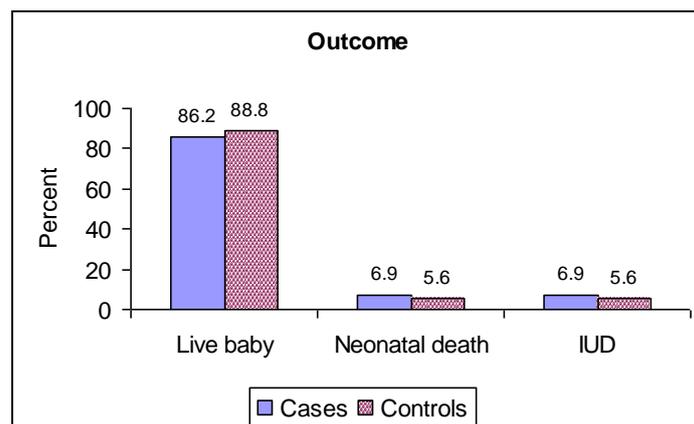


Distribution of Outcome

| | Case | Control |
|-----------|------------|-----------|
| Live baby | 50 (86.2%) | 64 (88.8) |
| NND | 4 (6.9%) | 4 (5.6 %) |
| IUD | 4 (6.9 %) | 4(5.6 %) |
| Total | 58 (100%) | 72(100%) |

χ^2 - 0.550; p- 0.459; OR- 1.47; not significant

Majority were live baby in both groups. Dead babies 13.7% in the case group compared to 11.2% which was statistically not significant.



Discussion

Incidence of placenta previa and morbidly adherent placenta is on rise⁶. Decidual formation may be defective over a cesarean scar⁷. Present study concluded the overall incidence of placenta previa in our institution is 1.34%. Silver and associates reported incidence 1.3% with one previous cesarean⁸. Mathuriya et al study also concluded similar results⁹.incidence of placenta previa increases with increasing age and parity¹⁰.Getahun D et al study concluded that there is a dose response pattern in the risk of previa with increasing no of prior cesarean section and short pregnancy interval is also associated with increased risk¹¹.study by Ihab m usha et al also showed increase in rate of placenta previa with increase in no of previous cesarean¹².various literature concluded that increasing parity increases the risk of placenta previa¹³.our study included only multigravida in order to avoid bias. Placenta previa poses more risk of complications like PPH and its surgical treatments cesarean hysterectomy and operative morbidity are more in case group^{14,15}. In present study all cases of adherent placenta seen in previous cesarean which is consistent with Clark etal study¹⁶. according to ACOG, incidence of morbidly adherent placenta is 1:2500 per delivery².management of morbidly adherent placenta is challenging now a days,. Wong et al also found this is the most frequent indication for peri partum hysterectomy¹⁷.

Requirement of blood and components transfusion is also significantly higher in case group¹⁸. fetal complications in terms of prematurity and its complication are more in cases of placenta previa with previous caesarean. This is because of early onset of APH and associated maternal morbidity.

Conclusion

Present study concludes that placenta previa when combines with history of previous cesarean will surely affect the outcome of both mother and foetus .cases in previous caesarean with placenta previa morbidly adherent placenta should be ruled out and it should be managed in a tertiary care centre with availability of expert high risk obstetrician, anaesthetist, paediatrician, well equipped NICU and availability of blood and components.

Finally effort should be made to reduce the cesarean section rate as it poses more risk of placenta previa, morbidly adherent placenta and its related complication in future pregnancy.

References

1. Williams obstetrics, 24th edition, chapter 41 obstetrical haemorrhage, page 800
2. ACOG committee on obstetric practise. ACOG committee opinion number 266, Jan 2002 :placenta accrete obstet Gynecol 2002 99 : 169-70
3. Wong, HS, Cheung YK, Zuccolo J, et al: evaluation of sonographic diagnostic criteria for placenta accrete. J Clin Ultrasound 36[9]:551,2008
4. Salihu HM, Liq Rouse FJ et al Placenta previa: Neonatal death after live birth in US. Am J Obstet Gynaecol. 2003; 188: 1305.
5. Crane JMG, Vanden Hof MC, Dodds L. et al. Neonatal outcome with placenta previa. Obstet Gynecol. 1999; 93: 541
6. Esakoff TF,Handler S Granados JM, et al: PAMUS : placenta accrete management across the United States.J Mat Fet Neonatal Med 25;761,2012
7. Benirschke K, Burton, Baergen RN: Pathology of human placenta, 6th edition. New York, springer, 2012, p 204.
8. Morken N H, Henriksen H Placenta percreta two cases and review of literature. Eur J Obstet Gynecol Reprod Biol 2001;100;112-15
9. Mathuriya D, Lokhande P. Comparative study of obstetric outcome between scarred and unscarred uterus in placenta previa cases Indian journal of clinical practice.vol24, no6, Nov 2013.
10. Bencaiova G, Burkhardt T, Beinder; Abnormal placental invasion experience at 1 centre E J Reprod Med 2007 Aug 52(8)709-14
11. Getahun D, Oyelese Y, Salihu H M, Ananth CV Previous caesarean delivery and risk of placenta previa and placental abruption
12. Ihab M ,Usha MD, Elie M et al placenta previa accrete risk factors and complications, American J Obstet Gynecol 2005 .193, 1045-9
13. Reddy R, Latha C. Placenta previa: an analysis of 4 year experience. J Obstet Gynaecol 2005:193: 1045-49.
14. Avan N, Benneth M J Walters WA Emergency peri partum hysterectomy; a 10 yrs. old review at Royal Hospital for women, Sydney, Aus NZ J O bstet Gynecol 51(3); 210, 2011
15. Jang DG, We JS, Shinn JU, Choi YJ, Ko HS, Park IY et al Maternal outcome according to placental position in placenta previa. Int j Med Sci 2011;8(5)439-44
16. Clark SL, Belfort MA, Carolan M, et al: Maternal death in the 21st century: causes, prevention and relationship to caesarean delivery. AM J Obstet Gynaecol- 199: 36. El, 2008
17. Wong TY; Emergency peri partum hysterectomy; a 10 y review in a tertiary obstetric hospital, NZ Med J124(1345);34,2011

18. Knight M, UKOSS: Peri partum hysterectomy in UK; management and outcome of the associated haemorrhage, BJOG 114: 1380, 2007.