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CAESAREAN SECTION FOR PLACENTA PRAEVIA: A RETROSPECTIVE STUDY OF ANAESTHETIC TECHNIQUE AND FOETO-MATERNAL OUTCOME.

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ABSTRACT

Introduction: Placenta praevia complicates approximately 0.3-0.8% of pregnancies in multiparous parturient and there is an increased risk in those with previous Caesarean section. The choice of anaesthetic technique usually poses dilemma to the attending anaesthetist. The aim of this study was to review the choice of anaesthetic technique for caesarean section complicated by placenta praevia and determine foeto-maternal outcome.
Patients and Methods: This was a retrospective survey covering a period of four years (January 2013 - December 2016). After Ethics Committee approval, information was obtained from the anaesthetic and theatre records and the patients' case notes. The information obtained were: patients' characteristics, obstetric history, grade of placenta praevia, indications for surgery, choice of anaesthetic technique, PCV/haemoglobin level, haemodynamic changes, blood transfusion, maternal and foetal outcome. The data were analysed using IBM SPSS version 20.
Results: A total of 4,388 Caesarean sections were carried out during the 4- year period of review. One hundred and forty-five cases (3.3%) with different degrees of placenta praevia progressing to Caesarean section were identified. The mean age (years) was 32.6+5.3 with a mean gestational age(weeks) of 36.7±1.11. Thirty-nine (26.9%) patients were offered general anaesthesia while 106 (73.1%) were done under spinal anaesthesia. The mean blood loss in the GA and spinal group was 1,080 + 970.53 and 753.77 + 568.19 ml respectively (P = 0.0135). 87.6% neonates were delivered alive. Seventy-nine (54.5%) were elective procedure with adequate preparation. There were two (1.4%) cases of maternal mortality and perinatal mortality of 12.4%.
Conclusion: The anaesthetic technique for patients with placenta praevia should be determined by the patient's haemodynamic status and the grade of the placenta praevia.

Keywords: Placenta praevia, anaesthetic technique, maternal, neonatal outcome.

INTRODUCTION

Placenta praevia is a positional disorder of human placenta where the placental overlies or is in close proximity to the internal cervical os, thereby preventing vaginal delivery.[1] The lower segment of the uterus has a comparatively rich blood supply and may account for the abnormal occurrence of placental implantation in the lower uterine segment.[2] Patients usually present with painless vaginal bleeding and the haemorrhage may be severe enough to cause hypovolaemia and anaemia at presentation. It complicates approximately 0.3-0.8% of all pregnancies in multiparous parturient and shows an increased risk in those with previous Caesarean section.[3] The haemorrhage may be significant enough to threaten the life of the mother and the foetus making the delivery imminent either on elective or emergency basis.[4]

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Controversy exists on the best choice of anaesthetic technique for Caesarean section for delivery complicated by placenta praevia.[3] Majority have the opinion that general anaesthesia (GA) should be the choice of anaesthesia in patients with placenta praevia rather than regional anaesthesia due to the risk of excessive bleeding and hypovolemic shock that may occur.[5,6] However, studies have shown that there is a place for regional anaesthesia in patients with placenta praevia.[7,8]

The advantages of regional technique are: mother is awake, avoidance of risks of GA, adequate pain relief, rapid recovery and probably reduced blood loss. The disadvantages of regional techniques are: the surgery may be prolonged hence short duration of regional anaesthesia may not be adequate for the surgery, maintaining haemodynamic stability in a likely hypovolaemic patient is challenging, and if surgery is complicated and prolonged, there may be need to convert to general anaesthesia.

The advantages of general anaesthesia are: patients are not awake, no anxiety and surgeons are more relaxed. The disadvantages of GA are: inadequate postoperative pain relief, increased (temporary) neonatal depression with GA and use of more anaesthetic drugs on like regional anaesthesia.

Previous authors have demonstrated the use of subarachnoid block in surgical management of placental praevia, but the foetal maternal wellbeing in relation to these available technique options were not emphasised. According to a study by Adigun and colleagues,[6] 47.8% of patients received sub-arachnoid block which was comparable to that of Imarengiaye et al[8] that reported 35.8% of patients with placenta praevia that had subarachnoid block for caesarean section. Regional anaesthesia is considered safe in the absence of bleeding and hypovolaemia,[3] However, there are concerns with regional anaesthesia in the presence of placenta praevia. The sympathetic blockade from regional anaesthesia causes vasodilatation and hypotension which may worsen the hypotensive effects arising from intraoperative blood loss.

The choice of regional anaesthesia as an anaesthetics technique for patients with placenta praevia seemed to depend majorly on the packed cell volume above 30%, absence of antepartum haemorrhage, and the absence of hypotension as well as the grade of the placenta praevia. The decision regarding anaesthetic technique depends strictly on the hospital protocol and individual patient circumstance.[9] Minor placenta praevia (types 1 and 2) are amenable to spinal anaesthesia and major placenta praevia (types 3 and 4) are mostly done under general anaesthesia. The high intraoperative blood loss often associated with placental praevia may impact on fetal outcome. It may be necessary therefore, to determine the materno-fetal outcome at caesarean sections complicated by placental praevia.

This study reviewed retrospectively, the choice of anaesthetic technique for caesarean section complicated by placenta praevia and determined the foeto-maternal outcome.

PATIENTS AND METHODS

This was a retrospective study of 4 years duration (January 2013 - December 2016). After Institutional Ethics Committee approval, information was obtained from the anaesthetic register in the obstetric theatres, anaesthetic charts, the nurses' register, the patients case notes and ICU records (for those that were admitted into the intensive care unit in the immediate postoperative period).

The information obtained were patients' characteristics, ASA physical health status classification, gestational age, parity, number of previous caesarean section, grade of placental praevia the nature of the surgery (emergency or elective as defined by the obstetricians), choice of anaesthetic technique, the grade of the most senior anaesthetist/surgeon, estimated blood loss during surgery, preoperative packed cell volume or haemoglobin level, ANC attendance, referral from other health facility, US scan results, history of persistent vaginal bleeding within 24 hr postoperative PCV/Hb level, drugs/dose, baseline vital signs, haemodynamic changes, blood transfusion, blood products given, outcome of anaesthesia and surgery, neonatal outcome and duration of hospital stay.

The collected data was analysed using IBM SPSS version 20. Continuous data were expressed as means and standard deviations and analysed using student's t-test. Categorical data are presented as frequency and analysed using Chi-square with Yates correction as indicated. A p value of < 0.05 was considered significant.

RESULTS

A total of 4,388 caesarean sections were carried out

during the 4-year review period. One hundred and forty five patients (3.3%) presented with different degrees of placenta praevia at caesarean section. The mean age (years) was 32.6 + 5.3 with a mean gestational age (weeks) of 36.7±1.11. Hundred and one patients (69.7%) were booked while 44 (30.3%) were unbooked. Ninety-One (62.8%), 47 (32.4%), and 7 (4.8%) were classified as ASA 2, 3, and 4 respectively. The grades of placental praevia are type I (n=14, 9.6%), type II (n=31, 21.4%), type III (n=59, 40.7%) and type IV (n=41, 28.3%) respectively. Seventy-nine (54.5%) were elective cases (ELCS) while 66 (45.4%) were emergency caesarean sections (EMCS) on account of antepartum haemorrhage and foetal distress. Table I shows the maternal and foetal characteristics and

TABLE 1: MATERNAL/NEONATAL CHARACTERISTICS AND OUTCOME

Variable	General Anaesthesia (GA) n = 39	Spinal Anaesthesia (SP) n = 106	P-value
Maternal Age (yr)	33.36 ± 5.20	32.34 ± 5.34	0.8769
Gestational age	36.55 ± 1.04	36.72 ± 1.14	0.5279
Preoperative PCV (%)	30.26 ± 3.16	31.51 ± 2.99	0.6478
Range (%)	18 – 31	21 – 41	02
Postoperative PCV	28.96± 1.86	30.82± 2.	0.4.4
EBL (ml)	1080.77 ± 970.53	753.77 ± 568.19	0.0135
Transfusion	14 (35.8%)	14 (13.2%)	0.0039
Vasopressor use	6 (4.1%)	18 (12.4%)	1.0000s

TABLE 2: NEONATAL OUTCOME

Alive	26(68.4%)	101(94.4%)	
Stillbirths	12(31.6%)	6(5.6%)	
Apgar score >7			
1 min	23(88%)	91(86%)	0.0011
5 min	26(100%)	99(93%)	0.0001

The study was presented at the 6 All African Anaesthetists Congress, Abuja in November,2017

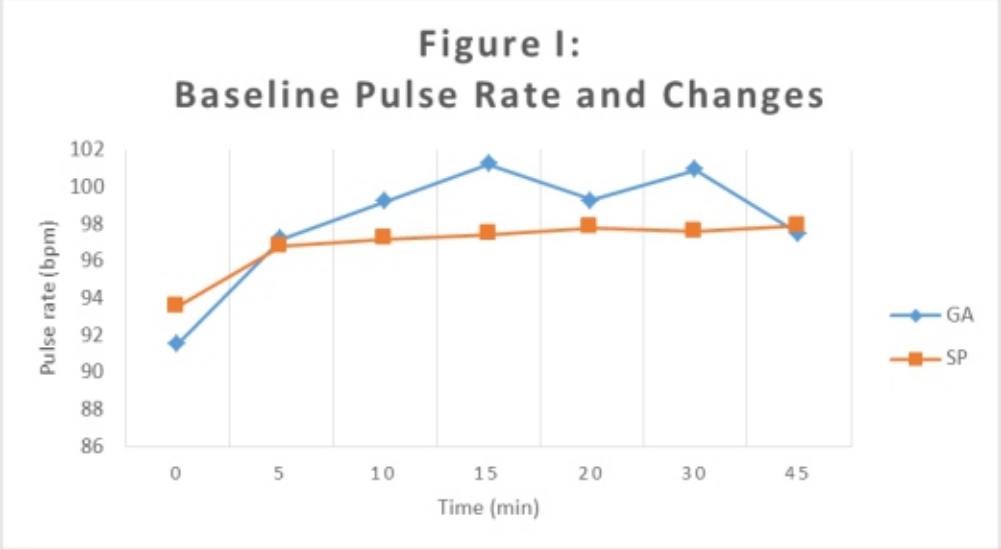


Figure II:
Baseline systolic blood pressure and changes

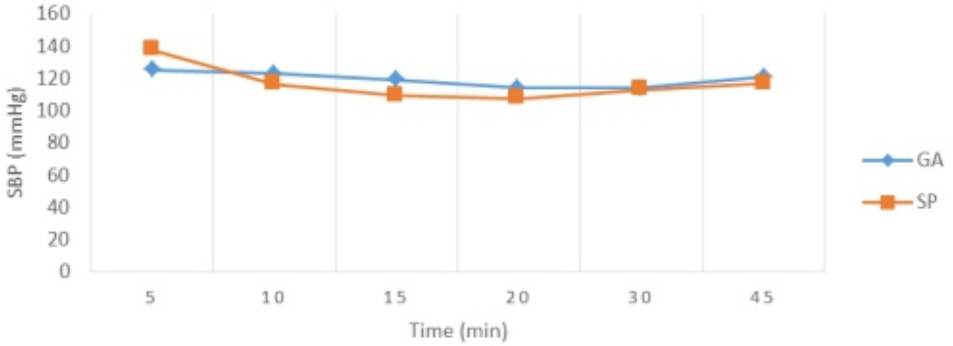


Figure III :
Baseline diastolic blood pressure and changes

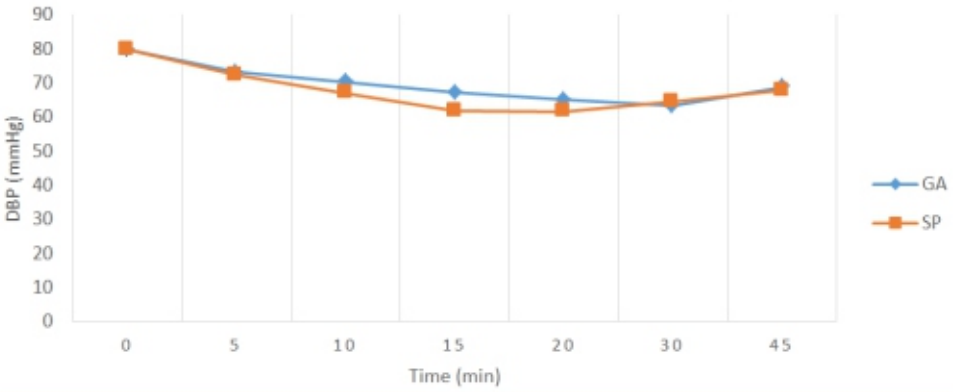
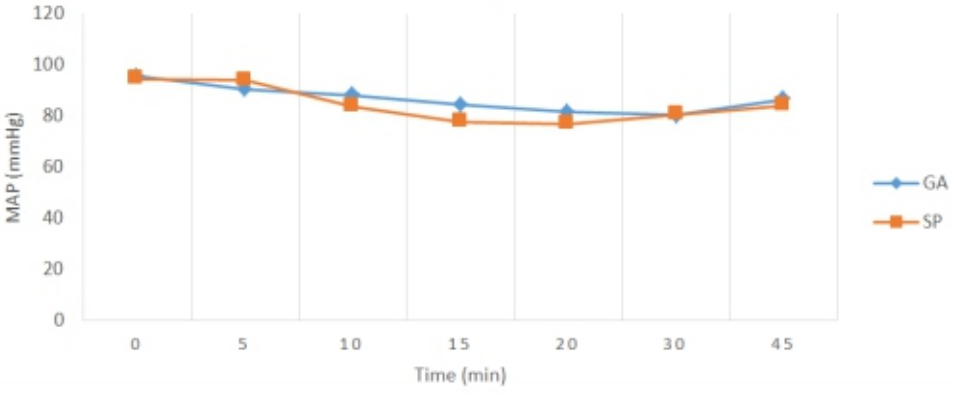


FIGURE IV:
Baseline mean arterial pressure and changes



outcome.

Thirty-nine (26.9%) patients were offered general anaesthesia with relaxant technique and IPPV (ketamine or thiopentone sodium, suxamethonium, atracurium or pancuronium) while 106 (73.1%) were done under spinal anaesthesia. Thirty nine consultant anaesthetists (27%) and 106(73%) senior registrars provided anaesthesia for the surgeries. The consultant surgeons were 48(33%) and ninety seven (67%) senior registrars' performed the operation. The mean dose of hyperbaric bupivacaine used was 2ml. The minimum blood loss was 250ml with a maximum of 4,200ml. With regard to baseline pulse rate and variations, systolic blood pressure (SBP), diastolic blood pressure (DBP) there was no statistical difference between the two groups, figures I-III. At 5 minutes after induction of general anaesthesia and spinal, the MAP(mmHg) was lower in the general anaesthesia group (90.73 + 10.9) than the spinal group (94.2+ 47.2) and the difference was statistically significant (P=0.0001), figure IV. The mean blood loss in the GA and spinal group was 1,080 + 970.53 and 753.77 + 568.19 ml respectively (P = 0.0135).

One hundred and seventeen (80.7%) patients did not have blood transfusion while twenty-eight (19.3%) were transfused. Ephedrine was used to manage hypotension in 24 (16.6%) patients (6 in the GA group and 18 in the spinal group). A maximum dose of 18mg ephedrine and a minimum dose of 6mg were administered. The mean preoperative PCV for the GA and Spinal groups were 30.26+ 3.16 and 31.51+ 2.99 respectively. Postoperative PCV for the GA group was 28.96+ 1.9 while for the spinal group, 30.82+ 2.02. (Table 1). The proportion of multiparous women was 64.14% as against 11.72% nulliparous. Previous caesarean section was documented in 30.34% women. The data on parity was not available (missing) for 35(24.14%) patients.

Post-operative analgesic regimen included a combination of tramadol, pethidine, pentazocine and paracetamol, administered either intravenously or intramuscularly and surgical wound infiltration with 20mls (0.125%) plain bupivacaine.

Neonatal outcome showed that 127 (87.6%) neonates were delivered alive, with 18 (12.4%) fresh still births. Mean birthweight (in kg) was 3.91 + 0.5. At 1 minute, 114 (78.6%) had APGAR scores of greater than 7 while at 5 mins, assessment showed that 125 (86.2%) had scores greater than 7 (Table II). The average duration of stay postoperatively was 5days. There were two maternal mortalities as a result of severe haemorrhage complicated with DIC. They both died in the intensive care unit (ICU).

DISCUSSION

This study shows that the prevalence of placental praevia in the obstetric population is 3.3%. Subarachnoid block (spinal anaesthesia) is the favoured anaesthetic technique of choice for the perioperative management of placental praevia. In addition, general anaesthesia was associated with higher intraoperative blood loss, haemodynamic instability and consequently more blood transfusion during caesarean section. The Apgar scores were consistently better in the neonates from mothers that received subarachnoid block than general anaesthesia in the first and fifth minutes of life.

The choice of anaesthetic technique for placental praevia is determined by several factors including surgical concerns, patient's desires, the type of placental praevia, previous uterine surgery, the urgency of the caesarean section and the extent of any continuing antenatal blood loss.[10,11] Regional anaesthesia is a likely choice of anaesthetic technique in preoperative haemodynamically stable patients. This may have been responsible for the high rate of subarachnoid block in this series. The observed high rate of caesarean sections under regional anaesthesia is comparable to the results by other authors.[12,13] In contrast, our findings appears higher than the reported prevalence of regional anaesthetic caesarean sections in Nigeria.[6,8] Adigun and colleagues, recorded 47.8% spinal anaesthesia for caesarean section and Imarengiaye et al reported 35.8%. The difference in the observations may be related to the improved attendance at the antenatal clinic and consequent elective scheduling for caesarean section. The lower rate of emergency caesarean section as seen in this study may further describe the low use of general anaesthesia.

Furthermore, antepartum haemorrhage is a common presentation of placental praevia as also observed in this study (72%). Bhat et al[5] reported nearly two thirds with placental praevia present with antepartum haemorrhage. This report is similar to the incidence of 64.4% reported by Adigun et al.[6] The severity of bleeding and consequent blood loss

may result in hemodynamic perturbation in the mother. Such hemodynamic instability would provoke the use of general anaesthesia for the caesarean sections. However, there was no difference in the preoperative or baseline haemodynamic parameters in the mothers that received general anaesthesia or regional anaesthesia. This lack of difference in haemodynamic status may have favoured the high rate of spinal anaesthesia for the caesarean sections in this study.

More patients (35.8%) in the general anaesthesia group had blood transfusion as against 13.2% in the spinal group. Evidence in the literature supports the increased blood loss in a patient with placenta praevia during caesarean delivery with the use of a general anaesthetic.[13,14,15] It is not clear if general anaesthesia is a cause or an effect of the blood loss. The perioperative transfusion may have resulted from the antepartum haemorrhage which would provoke the use of general anaesthesia. However, this may not be the case here as preoperative variables were similar. Nevertheless subarachnoid anaesthesia protects against blood loss in the perioperative period.

Previous studies have documented higher incidence of placenta praevia in multiparous and grand multiparous women.[16,17,18] In Fatemeh et al[19] study, the mean gestational age was 34.7 weeks that was lower than the average obtained in our study (36.7 weeks) but similar to other study.[25] In our study, mean birth weight was 2.86 (0.053) and it was higher than the values reported by other similar studies.[19,20] The difference could be as a result of lower gestational age in their studies.

APGAR scores both at one and five minutes were evidently lower among newborn of mothers with placenta praevia. Neonatal outcome in both the spinal and general anaesthesia groups was similar at 1minute after delivery as demonstrated by the Apgar scores. There is slight difference at 5minutes, all the neonates (100%) in the subarachnoid anaesthesia group exhibited higher scores as against 93% in the general anaesthesia group. The use of 100% supplement oxygen during GA and SAB could be possible reason for the observation. However, this supports the findings by Adigun et al[6] that reported a better Apgar scores in the spinal group.

One to 6 percent of pregnant women display sonographic evidence of a placenta praevia between 10 and 20 weeks of gestation when they undergo obstetrical ultrasound examination for assessment of gestational age, fetal anatomic survey, or prenatal diagnosis. The overall false positive rate of transabdominal ultrasound for diagnosis of placenta praevia is high (up to 25 percent), so the diagnosis should be confirmed by transvaginal ultrasound unless the praevia is clearly central.[21] Neonatal morbidity and mortality rates in pregnancies complicated by placenta praevia have fallen over the past few decades because of improvements in obstetric management which include (antenatal corticosteroids, delayed delivery when possible), the liberal use of caesarean delivery, and improved neonatal care.[22] The principal causes of neonatal morbidity and mortality are related to preterm delivery, rather than anaemia, hypoxia, or growth restriction.[22]

LIMITATIONS

There are clear limitations to the interpretation of these results. First, it is a retrospective design with distinct constraints particularly with record keeping. The assessment of neonatal outcome with Apgar scores is another limitation. Current practice favours the use of umbilical artery p^H. Nevertheless, the observation of increase rate of spinal Anaesthesia for placental praevia with minimal materno-fetal adverse outcomes is relevant to the practice of obstetric anaesthesia.

CONCLUSIONS

This retrospective study shows that spinal anaesthesia was the technique of choice for the majority of cases. Maternal and foetal outcome were favourable in both the spinal and general anaesthesia groups. The study also showed that there is also a corresponding increase of utilisation of spinal anaesthesia for patients with placenta praevia undergoing caesarean section. Spinal anaesthesia is safe for use and it is associated with no major complications when patients are appropriately selected and do not have significant antepartum haemorrhage. The anaesthetic technique for patients with placenta praevia should be determined by the grade of placenta praevia, the patient's pack cell volume and preoperative haemodynamic status.

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