

Original Article

Retrospective analysis of anesthesia for hypertensive disorders in pregnancy at University of Ilorin Teaching Hospital, Kwara State

ABSTRACT

Background: Hypertensive disorders are one of the most common medical complications of pregnancy. It is a major cause of fetomaternal morbidity and mortality. **Objectives:** This article compares the clinical outcome of anesthetic techniques for parturients with hypertensive disorder undergoing cesarean section. **Methods:** We conducted a retrospective review of the medical records of patients with hypertensive disorders in pregnancy, who underwent cesarean section from January 2016 to December 2017. Data collected included demographic profiles, specific hypertensive disorders, anesthetic techniques, and maternal and neonatal outcome. **Result:** Over the reviewed period, 1294 cesarean sections were done, out of which 95 (7.3%) patients had hypertensive disorders in pregnancy. Preeclampsia was the most common hypertensive disorder (45.3%) and it was more common among the multiparous patients. Eighty-two patients (86.3%) underwent subarachnoid block with 0.5% heavy bupivacaine, 10 patients (10.5%) had general anesthesia with relaxant technique using isoflurane as the volatile agent, whereas three patients (3.2%) had epidural block with 0.5% plain bupivacaine. Eighty-six patients (90.5%) were done as emergency whereas nine patients (9.5%) were done as elective. A total of 82 (86.3%) neonates had good APGAR score of >7 . There was no significant difference between the anesthetic techniques and neonatal outcome, $P = 0.642$. The proportion of blood loss was more during emergency surgeries. There was no statistical significant difference between the nature of surgery and estimated blood loss, $P = 0.691$. Out of the 95 parturient, 12 (12.6%) had hypotension that necessitated use of vasopressor (ephedrine), out of which 11 cases were done as emergency whereas one was done as elective. There was no significant difference between the nature of the surgery and the use of vasopressor, $P = 0.942$. **Conclusion:** The choice of anesthesia did not have a significant difference on maternal and neonatal outcome following cesarean section in parturient with hypertensive disorders in pregnancy.

Keywords: Anesthesia, cesarean section, hypertension in pregnancy

INTRODUCTION

Hypertensive disorders are one of the most common medical complications of pregnancy.^[1] It represents a group of conditions with elevated blood pressure before and/or during pregnancy that is categorized into four types: gestational hypertension (GH), preeclampsia/eclampsia, chronic hypertension, and preeclampsia superimposed on chronic hypertension.^[2] Hypertensive disorders are one of the most common medical complications of pregnancy with occurrence of 5% to 10% of all pregnancies.^[1] It is also a major cause of fetomaternal morbidity and mortality in our environment.

Most of the hypertensive disorders patients tend to have cesarean delivery, although not an absolute indication but

rather, for safe management of mother and neonate. Parturients with hypertensive disorders are predisposed to complications such as abruptio placenta, cerebral hemorrhage, hepatic failure, and acute renal failure. High perinatal mortality in women with hypertensive disorders is

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mainly due to premature delivery and growth restriction.^[3,4] The etiology of most cases of hypertension during pregnancy, especially preeclampsia, is not known.^[5]

The best choice of anesthesia for hypertensive disorder patients has remained controversial. There is paucity of study on anesthetic management of hypertensive disorders in pregnancy (HDP) in our environment. We retrieved the medical records of women who had hypertensive disorders and cesarean delivery during the period of 2 years. Our aim was to compare the clinical data and maternal and fetal outcomes in relation to the anesthetic techniques (general vs regional).

PATIENTS AND METHODS

The medical records of patients with HDP, who underwent cesarean section from January 2016 to December 2017, were retrospectively reviewed. Data collected included demographic profiles, specific hypertensive disorders, anesthetic techniques, cadre of anesthetists, and neonatal outcome. According to the specific hypertensive disorder and anesthetic methods extracted, the clinical outcome was compared. Data were analyzed and presented as frequencies and means using Statistical Package for Social Sciences (SPSS software version 22).

RESULTS

A total of 1294 cesarean section were done from January 2016 to December 2017, out of which 95 (7.3%) patients had HDP. Their ages ranged from 19 to 42 years with a mean age of 30.58 ± 5.142 (standard deviation). Table 1 shows the indications of cesarean section of HDP patients. Preeclampsia/eclampsia was the most common indication of cesarean section (62.1%). Previous cesarean section (11.6%) was the second most common indication.

Table 1: Indications for surgery

Indications for surgery	Frequency	Percent
Pre-eclampsia/Eclampsia	59	62.1
SPROM	1	1.1
CPD	6	6.3
Previous CS scar	11	11.6
Fetal distress	3	3.2
Failed induction	1	1.1
Abnormal presentation	3	3.2
Antepartum hemorrhage	1	1.1
Chronic hypertension	6	6.3
Bad obstetric history	4	4.2
Total	95	100.0

CPD, cephalopelvic disproportion; CS, cesarean section; SPROM, spontaneous premature rupture of membrane.

Preeclampsia was the most common hypertensive disorder (45.3%) and it was more common among the multiparous patients. In Table 2, there were more multiparous (54.7%) among the parturient. Pre-eclampsia was the commonest hypertensive disorder (45.3%) and eclampsia being the least (14.7%). Patients with chronic hypertension were 15.8%, pre-eclampsia (45.3%), eclampsia (14.7%), and gestational hypertension (24.2%). A total number of 15 (15.8%) cases were done by consultant anaesthetist, 42 (44.2%) were done by senior registrar, and 37 (38.9) cases were done by junior registrar. A case (1.1%) was missing. There was no significant difference between the nature of the surgery and the cadre of

Table 2: Parity of the patients, hypertensive disorders classification, and cadre of anesthetist

	Frequency	Percent
Parity		
Primiparous	28	29.5
Multiparous	52	54.7
Grand multiparous	15	15.8
Total	95	100.0
Hypertensive disorders		
Chronic hypertension	15	15.8
Preeclampsia	43	45.3
Eclampsia	14	14.7
GH	23	24.2
Total	95	100.0
Cadre of anesthetist		
Consultant	15	15.8
Senior Registrar	42	44.2
Registrar	37	38.9
Missing	1	1.1
Total	95	100.0

GH, gestational hypertension.

Table 3: Nature of the surgery, anesthetic techniques, and neonatal outcome

	Frequency	Percent
Nature of surgery		
Elective	9	9.5
Emergency	86	90.5
Total	95	100
Anesthetic techniques		
GA	10	10.5
SAB	82	86.3
Epidural	3	3.2
Total	95	100
Neonatal outcome (APGAR 5 min)		
Low (0–3)	2	2.2
Intermediate (4–6)	7	7.4
Normal (≥ 7)	82	86.3
Missing	4	4.2
Total	95	100

APGAR, Activity, Pulse, Grimace, Appearance, Respiration; GA, general anesthesia; SAB, subarachnoid block.

anaesthetist who carried out the anaesthesia, $p = 0.496$. Table 3 shows a total of 82 (86.3%) neonates had good APGAR score of >7 . There was no significant difference between the anesthetic techniques and neonatal outcome, $P = 0.642$. This is shown in Table 4. Similarly, in Table 5, there was no significant difference between the nature of the surgery and the neonatal outcome, $P = 0.658$. In Table 6, most of the patients with hypertensive disorders had subarachnoid block. Forty-two patients out of 43 who had preeclampsia, 13 patients out of 15 patients who had chronic hypertension, 20 patients out of 23 who had GH, and seven patients out of 14 who had eclampsia had subarachnoid block. Tables 7 and 8 shows that there was more blood loss during emergency surgeries compared to elective surgeries. There was no episode of severe blood loss during elective surgeries. There was no significant difference between the nature of the surgery and the estimated blood loss, $P = 0.691$. The anaesthetic technique was also compared with the estimated blood loss in Table 8 and there was no statistical significant difference $p = 0.301$.

Table 4: Relationship between anesthetic techniques and neonatal outcome

Neonatal outcome in 5 min	Anesthetic techniques			P value
	GA	SAB	Epidural	
Low (0–3)	0	2	0	0.642
Intermediate (4–6)	2	5	0	
Normal (7–10)	7	72	3	
Missing	1	3	0	
Total	10	82	3	

GA, general anesthesia; SAB, subarachnoid block.

Table 5: Relationship between nature of surgery and neonatal outcome

Neonatal outcome in 5 min (APGAR)	Nature of surgery		P value
	Elective	Emergency	
Low (0–3)	0	2	0.658
Intermediate (4–6)	1	6	
Normal (7–10)	7	75	
Missing	1	3	
Total	9	86	

APGAR, Activity, Pulse, Grimace, Appearance, Respiration.

Table 6: Relationship between anesthetic techniques and hypertensive disorders

Anesthetic techniques	Chronic hypertension	Preeclampsia	Eclampsia	GH
GA	1	1	7	1
SAB	13	42	7	20
Epidural	1	0	0	2
Total	15	43	14	23

GA, general anesthesia; GH, gestational hypertension; SAB, subarachnoid block.

DISCUSSION

Our study included all the patients with hypertension during pregnancy. It was shown that the most common indication for cesarean section in patient with HDP was preeclampsia/eclampsia (62.1%). The prevalence rate of HDP varies with races or genetic factor. The incidence in this study was 4.6% which is still within the range of 2.5% to 7% gotten in advanced countries.^[6,7] In Nigeria, it is estimated that 5% to 10% of pregnancies are complicated by HDP.^[6–8]

Hypertension in pregnancy is a broad-spectrum clinical diagnosis that is categorized into four types. GH – transient hypertension of pregnancy if preeclampsia is not present at the time of delivery and blood pressure returns to normal by 12 weeks' postpartum or it progresses chronic hypertension. Preeclampsia/eclampsia – pregnancy-specific syndrome usually occurs after 20 weeks' gestation. It is determined by increased blood pressure with proteinuria. Eclampsia is defined as the occurrence in a woman with preeclampsia of seizure. Chronic hypertension – hypertension that is present and observable before pregnancy or that is diagnosed before the 20th week of gestation. Preeclampsia superimposed on chronic hypertension – preeclampsia may occur in women who are already hypertensive.^[2,9]

Women with preeclampsia have an increased rate of cesarean section due to high incidence of intrauterine growth restriction, fetal distress, and prematurity.^[9] There is high rate of emergency cesarean section in parturient with HDP, and this is due to hypertension and its complications, increasing elderly pregnancy and scheduled cesarean

Table 7: Relationship between nature of surgery and estimated blood loss

Estimated blood loss	Nature of surgery		P value
	Elective	Emergency	
Mild (<500 mL)	3	34	0.691
Moderate (501–1000 mL)	6	43	
Severe (>1000 mL)	0	7	
Missing	0	2	
Total	9	86	

Table 8: Relationship between anesthetic techniques and estimated blood loss

Estimated blood loss	Anesthetic techniques			P value
	GA	SAB	Epidural	
Mild (<500 mL)	3	32	2	0.301
Moderate (501–1000 mL)	4	44	1	
Severe (>1000 mL)	2	5	0	
Missing	1	1	0	
Total	10	82	3	

GA, general anesthesia; SAB, subarachnoid block. The anaesthetic technique was also compared with the estimated blood loss in table VIII and there was no statistical significant difference $P = 0.301$.

section by patient's requirement.^[12] Most of the surgeries that were done in our study were emergencies (90.5%).

The ideal choice of anesthesia for parturient with HDP has remained controversial. In the past, spinal anesthesia was contraindicated in patients with severe preeclampsia because it was thought that it could induce severe hypotension and placental hypoperfusion.^[11] However, the attending risk of general anesthesia such as difficult intubation and hypertensive response to laryngoscopy and intubation is another problem. Therefore, anesthetists must have much knowledge on the prevention, treatment, and anesthetic management for cesarean section of patients with HDP regardless of anesthetic technique. These risks in general anesthesia can be avoided by the use of regional techniques. In this study, 85.3% cases were done under subarachnoid block, 10.5% under general anesthesia, whereas 3.2% under epidural anesthesia. There was no significant difference between the anesthetic techniques and neonatal outcome, $P = 0.642$. This finding is supported by many clinical studies that spinal anesthesia could be performed safely in the cesarean section for severe preeclampsia patients.^[12,13] Spinal anesthesia has become a major anesthetic technique for the cesarean section of HDP patients in our hospital, and it is preferred by obstetricians because it offers the advantage of rapid onset. In our results, there was no significant difference in maternal and neonatal outcome between general and regional anesthesia group. The neonatal outcome at 5 minutes shows that 86.3% neonates had an APGAR score >7.

The intraoperative blood loss was not significantly different with the anesthetic techniques and the nature of the surgery in this study. This finding is contrary to what was found by Lee *et al.*^[10] who recorded more intraoperative blood loss during general anesthesia compared with regional anesthesia. The reason for disparity might be because fewer parturient had general anesthesia in our study.

CONCLUSION

In our study, the choice of anesthesia did not have a significant difference on neonatal and maternal outcome following cesarean section in parturient with HDP. The limitation of this study was that it is a retrospective study and some data were missing. A prospective study is recommended to fill the gaps in this study.

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Conflicts of interest

There are no conflicts of interest.

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