

ANESTHETIC TECHNIQUES FOR CAESAREAN SECTION IN BENUE STATE UNIVERSITY TEACHING HOSPITAL (BSUTH), MAKURDI, NIGERIA: A REVIEW OF ONE HUNDRED CONSECUTIVE CASES

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ABSTRACT

Background: Caesarean section (CS) is an operative delivery of the fetus by means of surgical incision through the anterior abdominal wall and the uterus. CS is one of the most commonly performed surgeries worldwide. The anesthetic technique to be used in caesarean section is determined by certain factors like urgency, presence of coexisting diseases, preference of patient and preference and experience of the anesthetist and surgeon. With all these factors in mind, the most appropriate general or regional anesthetic technique is selected. In obstetric anesthesia, regional anesthesia (RA) is usually preferred unless there is a contraindication. This study was aimed at ascertaining the anesthetic technique employed for CS in the Benue State University Hospital (BSUTH), Makurdi, Nigeria. **Methodology:** This was a retrospective study of 100 consecutive caesarean sections carried out with effect from January 2017 in BSUTH, Makurdi, a 360 bed hospital situated in the capital city of Benue State, North Central of Nigeria. The approval of the BSUTH Research and Ethical Committee was sought and obtained. A total of 100 case files of eligible patients were retrieved from the records department of BSUTH. Relevant information were extracted from the patients' folders and transferred into a prepared proforma. Data collected include age, sex, ASA classification, pre-operative diagnosis, surgical procedure undertaken, whether surgery was elective or emergency, anesthetic technique employed, complications of the technique and the management of such complications. The data collected were analyzed using SPSS version 25 and presented using simple statistics. **Results:** The age bracket between 21 years and 30 years constituted 69% of the study population. Also the bracket between 31 years and 40 years made up 23% of the population evaluated. The combination of these two age brackets made up 92% of the study population. Majority of the patients (49%) fell into the category of ASA IIE. Of the 110 indications for surgeries that were recorded, failure to progress accounted for 26 representing 23.6% just as Placenta Previa followed with 10 cases making up 9.1%. Twenty cases (20%) were undertaken as elective while 80 (80%) were emergencies. Eight patients underwent GA with tracheal intubation making up 8% of the study population while the rest of the patients (92 [92%]) underwent sub-arachnoid block (SAB). Of the 42 complications observed, hypotension was encountered most occurring 23 times and making up 54.8%. Accordingly, administration of intravenous (IV) crystalloid along with IV ephedrine was undertaken 23 times representing 54.8%. **Conclusion:** The study revealed that the most preferred, anesthetic technique for caesarian section in this institution is sub-arachnoid block both for elective and emergency caesarian sections. This is because the technique is easier to perform than other regional techniques. Also, the employment of GA is not often recommended because of difficult airway issues. General anesthesia, not surprisingly, comes second. There is the need for more trained personnel and equipment to be made available so as to popularize the other regional techniques such as epidural and combined epidural-spinal (CES).

INTRODUCTION

Caesarean section (CS) is an operative delivery of the fetus by means of surgical incision through the anterior abdominal wall and the uterus.^[1] CS is one of the commonest surgeries performed worldwide. The

anesthetic technique to be used in caesarean section is determined by some factors such as urgency, presence of coexisting diseases, preference of patient and preference and experience of the anesthetist and surgeon. Keeping

in mind these factors, the most appropriate general or regional anesthetic technique is selected.^[2,3,4]

In obstetric anesthesia, regional anesthesia (RA) is usually preferred unless there is a contraindication. Regional anesthesia has some advantages like faster recovery of gastrointestinal functions after surgery, better postoperative analgesia, early mobilization of the patient in the postoperative period, early communication between mother and baby and lower risk of drug toxicity for the mother and the baby.^[5,6] Some significant disadvantages of RA are hypotension, bradycardia, possibility of an insufficient analgesia level, headache, back pain, post-operative immobility, urinary retention as well as development of allergy and toxicity because of local anaesthetics.^[4,7]

General anesthesia (GA) has the advantage of being a fast and safe technique in emergency cases with high bleeding risk.^[8] The frequency of difficult intubation during general anesthesia in caesarean sections is 8-fold higher than that in normal population because of physiological changes caused by pregnancy.^[9] Disadvantages of GA include difficult airway, hypotension due to rapid induction, gastric fluid regurgitation and pulmonary aspiration risk, airway complications in the early post-operative period, pain as well as nausea and vomiting. Other disadvantages are decreased Apgar scores of newborns because of the passage of intravenous anesthetics through the placenta, stress response to anesthesia and surgery by the mothers and the use of low-dose anesthetic agents to prevent newborns from being affected by these agents.^[3,4,10]

This study was conducted to ascertain the most common anesthetics technique employed for CS in the Benue State University Hospital (BSUTH), Makurdi, Nigeria.

METHODOLOGY

This was a retrospective study of 100 consecutive caesarean sections carried out with effect from January 2017 in BSUTH, Makurdi, a 360 bed hospital situated in the capital city of Benue State, North Central of Nigeria.

ETHICAL CONSIDERATIONS.

The approval of the BSUTH Research and Ethical Committee was sought and obtained.

ELIGIBILITY

INCLUSION CLITERIA

One hundred consecutive caesarean sections carried out in the Obstetrics and Gynecology department in BSUTH starting from January 2017 were evaluated.

EXCLUSION CRITERIA

Surgeries other than CS were excluded.

PROCEDURE

A total of 100 case files of eligible patients were retrieved from the Records Department of BSUTH

approval. Relevant information were extracted from the patients' folders and transferred into a prepared proforma. Data collected included age, sex, American Society of Anesthetists physical status (ASA) classification, pre-operative diagnosis, surgical procedure undertaken, whether surgery was elective or emergency, anesthetic technique employed, complications of the technique and the management of such complications. Data were analyzed using SPSS version 25 using simple statistics.

RESULTS

AGE DISTRIBUTION

Majority 69 (69%) of the patients fell within the age bracket of 21 to 30 years. This was followed by the age bracket of 31 to 40 years with 23 (23%) of the study population. While 6 (6%) patients were teenagers, only 2 (2%) fell within the age bracket of 41 and 50 years (tab 1).

ASA CLASSIFICATION

Majority 49 (49%) of the patients fell into the category of ASA IIE. ASA II followed with 17 (17%). ASA IIIIE patients came next with 15 (15%). While patients with ASA IE and ASA IVE were 8 (8%) each, 1 patient was of category I making up 1% of the study population (tab 2).

PRE-OPERATIVE DIAGNOSIS

Indications for CS carried out were many and varied, occurring singly or combinations of two or more. A total of 110 indications were recorded. Of this figure, failure to progress accounted for 26 representing 23.6%. Placenta prevea followed with 10 cases making up 9.1%. Five cases of eclampsia were found (4.5%), coming next to the first two. While 4 cases of two previous CS were recorded, 3 cases each of obstructed labor and pre-eclampsia were also recorded representing 3.6%, 2.7% and 2.7% respectively.

The rest of the other indications were recorded either once or twice, again in various forms of combination.

SURGICAL PROCEDURE

All patients underwent lower segment caesarean section. However, 20 (20%) were undertaken as elective while 80 (80%) were emergencies (fig 1).

ANAESTHETIC TECHNIQUE

Eight patients underwent GA with tracheal intubation making up 8% of the study population. The rest of the patients (92 [92%]) underwent sub-arachnoid block (fig 2).

COMPLICATIONS OF ANAESTHETIC TECHNIQUE

A total of 42 episodes of complications were recorded. These included hypotension, pain and shivering. They occurred singly or in combination. Of these complications, hypotension was observed most occurring 23 times and making up 54.8%. Seventeen episodes of

break through pain were observed while 2 episodes of shivering were observed making up 40.5% and 4.4% of complications respectively (fig 3).

MANAGEMENT OF COMPLICATIONS

Management of complications was tailored towards ameliorating the observed complication. Management modalities were also instituted singly or in combination depending on their timing and extent of occurrence.

Administration of intravenous (IV) crystalloid along with IV ephedrine was undertaken 23 times representing 54.8%. IV pentazocine was administered 9 times making up 21.4%. IV tramadol was given 4 times representing 9.5%, while IV ketamine was given 3 times representing 7.1%. In addition, IV pethidine was administered 2 times and intramuscular (IM) diclofenac was given once representing 4.8% and 2.3% respectively (tab 3).

Table 1: Age distribution.

Variable	Frequency	Percent
Age Group		
11-20	6	6.0
21-30	69	69.0
31-40	23	23.0
41-50	2	2.0

Table 2: ASA Classification.

ASA Classification	Frequency	Percent
I	1	1.0
IE	8	8.0
II	17	17.0
IIIE	19	19.0
III	2	2.0
IIIE	15	15.0
IVE	8	8.0

Table 3: Management of Complications.

Management of Complications	Frequency	Percent
iv Crystalloid/iv		
Ephedrine	23	54.8
iv Pentazocine	9	21.4
iv Tramadol	4	9.5
iv Ketamine	3	7.1
iv Pethidine	2	4.8
i.m Diclofenac	1	2.4

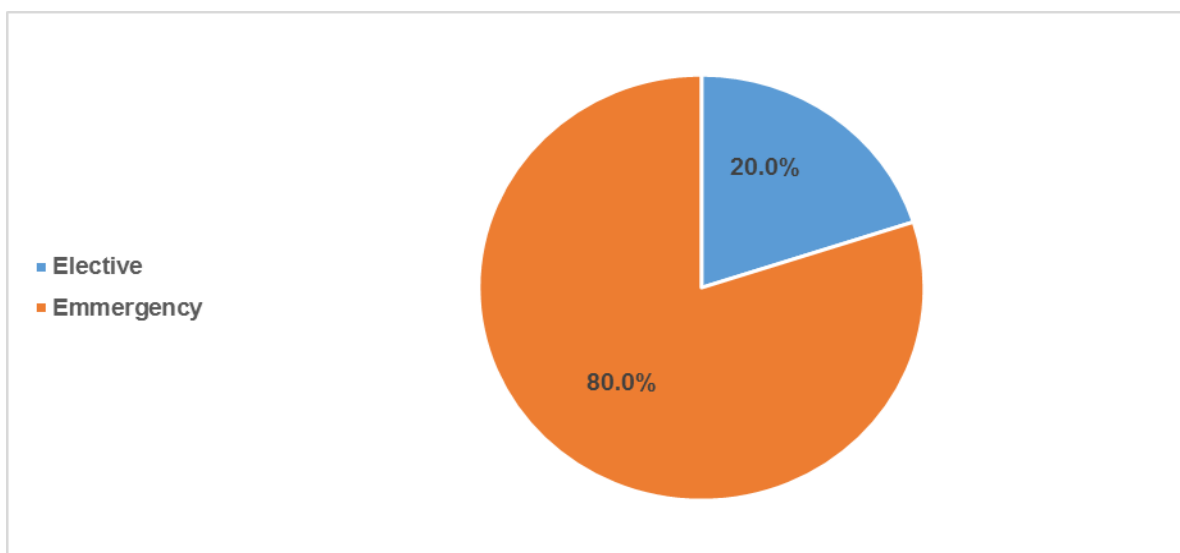


Figure 1: Types of Procedure.

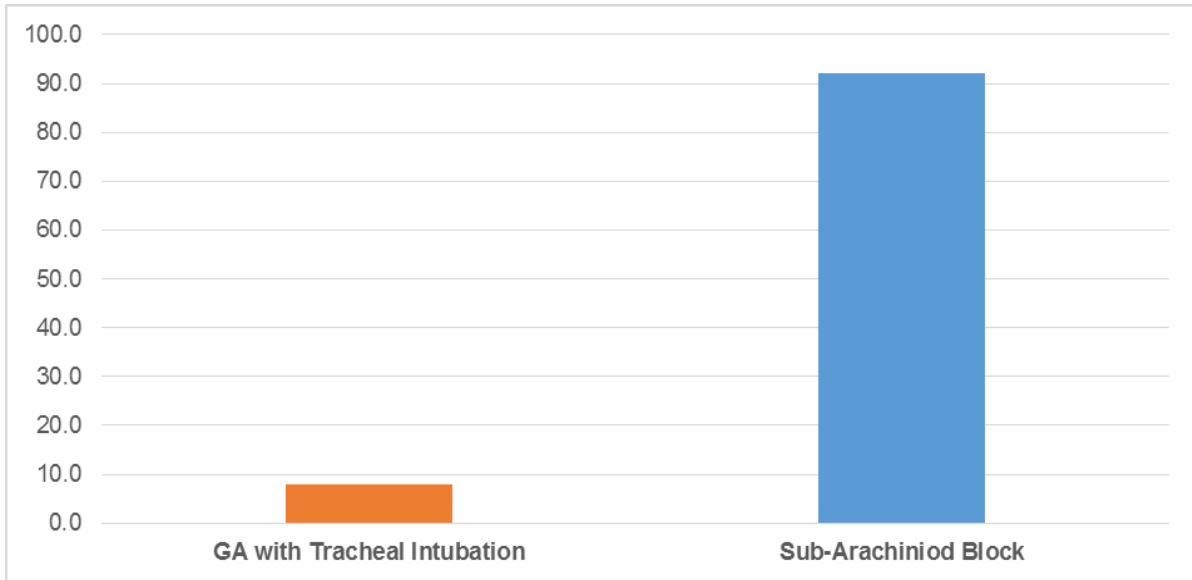


Figure 2: Type of Anaesthetic Technique.

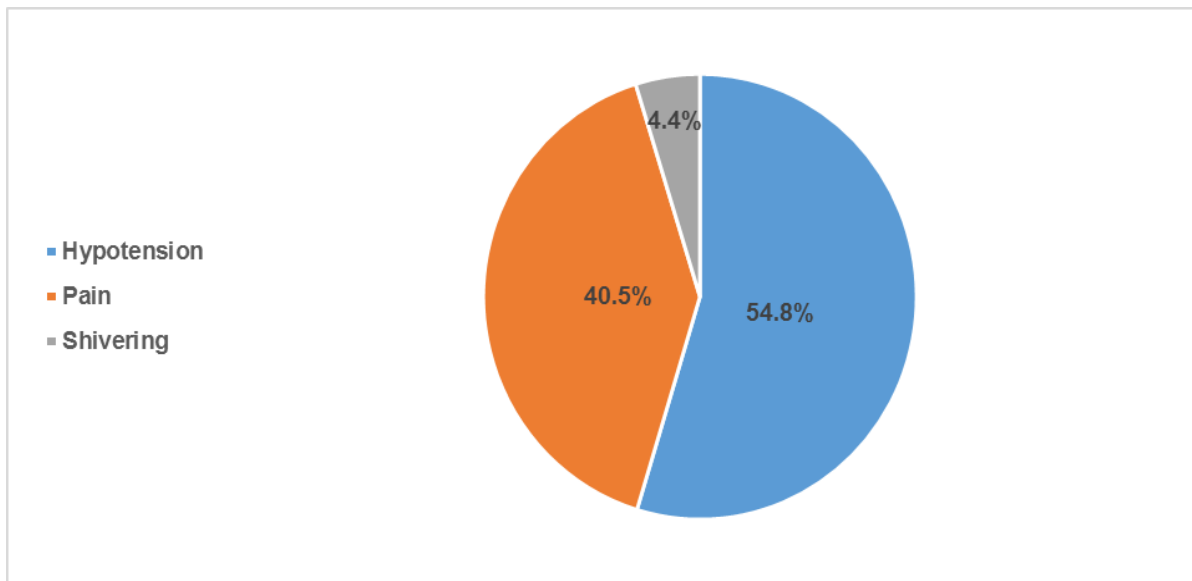


Figure 3: Types of Complications.

DISCUSSION

The age bracket of 21 to 30 years constituted 69% of the study population. Also the bracket between 31 years and 40 years made up 23% of the population evaluated. The combination of these two age brackets made up 92% of the study population. This is not unexpected since this is the age group that is most active in terms of reproduction. The fewer number of teenagers and those aged above 40 years is also not unexpected because fewer young girls get involved in preproduction just like the older ones also get less involved as a result of aging and menopause.

From the result the most common ASA classification was IIE (49%). This is because physiological changes associated with pregnancy are such that the parturient is not seen to be as the same with the non-parturient and may react differently if exposed to similar conditions. A

summation of the emergency ASA status of the patients, IE, IIE, IIE and IVE constituted 80%. This coincides with the 80% recorded for emergency leaving only 20% of the surgical procedure as elective. The findings in this study are similar to that by Banerjee et al^[11] and Gupta et al^[12] who recorded high rates of emergency cases of 75.6% and 62.08% respectively. It is, however, different from Sari et al^[8] who had more elective cases (59.2%) with emergencies making up only 40.2%.

In this study, failure of progress of labour and placenta prevea were the two most common indications for surgery accounting for 23.6% and 9.1% respectively. This may obviously have been as a result of obstetricians’ low threshold for surgical delivery whenever it is sensed that either the mother or the fetus could be in danger. While prolonged labor would ultimately lead to both fetal distress and maternal

exhaustion, placental prevea could lead to significant intra-partum hemorrhage thereby putting the life of both mother and fetus in danger. In their study Javed et al^[13] found that the common indications for emergency cesarean section were fetal distress (94.38%), cephalopelvic disproportion (CPD) (2.27%) and Placenta Prevea (1.25%). Similarly, Banerjee et al^[11], in their own study, observed that fetal distress was the commonest indication (32.8%) for CS. Their result was in agreement with studies by Barber et al^[14] and Liu et al.^[15]

An overwhelming majority of the surgical procedures were carried out under sub-arachnoid block (92%) as against 8% that were done under GA with tracheal intubation. Our result agrees with that obtained by Javed et al^[13] in which sub-arachnoid block accounted for 94.06% of anesthetic technique leaving GA and epidural block with 5.35% and 0.57% respectively. They reasoned that in developing countries where there is lack of modern anesthetic equipment and shortage of trained anesthetists, spinal anesthesia remains the preferred technique for cesarean deliveries. Similarly, Banerjee et al^[11] found that 89.2% of CS cases were performed under SAB. Even in emergency situations, the rate of use of SAB for CS remains high as reported by Sari et al^[8] where SAB was employed for 82% of elective cases and 65.2% of emergency cases. On the other hand, Okafor et al^[16] did not observe profound difference between GA and SAB recording 47.6% and 51% respectively with epidural block accounting for 1.1% of techniques used.

Hypotension, pain and shivering were the common complications observed following principally from SAB. Hypotension arises because of the sympathetic block below the level of block. This results in unopposed parasympathetic action leading to pooling of blood in the lower extremities. This in turn results in reduced venous return given rise to reduced cardiac output. The overall effect is thus, a reduced blood pressure. Pain comes up probably as a result of poor block or prolongation of surgery beyond the duration of effective action of the anesthetic agent used. The pooling of blood to the extremities as well as the usual cold theatre environment frequently results in shivering by patients.

Management of the complications observed was done in line with the nature of complications. Thus, the administration of crystalloid along with IV ephedrine was the commonest method used. While management of pain was achieved with the parenteral administration of pentazocine, ketamine and diclofenac, shivering was aborted by the administration of pethidine.

CONCLUSION

This study has demonstrated that the most preferred, anesthetic technique for caesarian section in this institution is sub-arachnoid block both for elective and emergency caesarian sections. This is because the technique is easier to perform than other regional technique. Also, the employment of GA is not often

recommended because of difficult airway issues. General anesthesia, not surprisingly, comes a distant second. There is the need to provide more trained personnel and equipment to popularize the other regional techniques such as epidural and combined epidural-spinal (CES).

Conflict of Interest

None.

REFERENCES

1. Yentis SM, Hirsh NP, Smith GB. Anaesthesia and intensive care A-Z: An Encyclopaedia of Principles and Practice, 5th edition. Edinburgh, Elsevier Butterworth Heinemann, 2013; 95.
2. Morgan GE, Mikhail MS, Murray MJ. Morgan: Clinical anaesthesiology. Ankara; 2008: 890921.
3. Birnbach DJ, Browne IM. Anesthesia for obstetrics. In: Miller's Anesthesia. Miller RD. 7th Edition. New York: Churchill Livingstone; 2009: 2203-2240.
4. Purtuloglu T, Ozkan S, Teksoz E, Dere K, Şen H, Yen T, et al. Elektif sezaryen uygulanan olgularda genel ve spinal anestezi maternas ve fetal etkilerinin karşılaştırılması. Comparison of maternal and fetal effects of general and spinal anesthesia in patients undergoing elective cesarean section. *Gülhane Tıp Dergisi.*, 2008; 50: 91-7.
5. Dahl V, Spreng UJ. Anaesthesia for urgent (grade 1) caesarean section. *Curr Opin Anaesthesiol.*, 2009; 22: 352-6.
6. Hawkins JL. Anesthesia related maternal mortality. *Clin Obstet Gynecol.*, 2003; 46: 679-87.
7. Dresner MR, Freeman JM. Anaesthesia for caesarean section. *Best Pract Res Clin Obstet Gynaecol.*, 2001; 15: 127-43.
8. Sarı MA, Küçükgüçlü S, Özbilgin Ş, Güneç FS, Mercan S, Esen A, et al. Retrospective Evaluation of Anaesthetic Techniques for Caesarean. *Turkish J Anaesthesiology reanimation.* 2015 Dec; 43(6): 373.
9. Prasad MK, Rani K. Retrospective evaluation of Anaesthetic method used in Caesarean sections: Changing trends. *Indian J App Res.* 2018 Feb 13; 7(5).
10. Davies NJH, Cashman JN. Çev; Turan İÖ. *Obstetri, Lee's Synopsis of Anaesthesia.* Güneş kitapçevleri., 2008: 657-80.
11. Banerjee A, Sakar D, Bhada B. Evaluation of anaesthetic techniques for caesarean. *Int J Res Med Sci.*, 2018 May; 6(5): 1742-6.
12. Gupta M, Garg V. The rate and indications of caesarean section in a teaching hospital at Jaipur, India. *Int J Reprod Contracept Obstet Gynecol.*, 2017; 6: 1 786-92.
13. Javed K, Ejaz B, Ishrat Z. Most Preferred Anaesthetic Technique for both elective and Emergency Cesarean Sections is Spinal Anaesthesia in a Tertiary Care Hospital. *P J M H S Vol. 10, NO. 4, OCT – DEC 2016:* 1340-3.
14. Barber EL, Lundsberg LS, Belanger K, Pettker CM, Funai EF, Illuzzi JL. Indications contributing to the

- increasing cesarean delivery rate. *Obstet Gynecol.*, 2011; 118(1): 29-38.
15. Liu S, Rusen ID, Joseph KS, Liston R, Kramer MS, Wen SW, Kinch R. Recent trends in caesarean delivery rates and indications for caesarean delivery in Canada., Maternal Health Study Group of the Canadian Perinatal Surveillance System *J Obstet Gynaecol Can.*, 2004; 26(8): 735-42.
 16. Okafor UV, Ezegwui HU, Ekwazi K. Trends of different forms of anaesthesia for caesarean section in South-eastern Nigeria. *J Obstet Gynaecol.*, 2009; 29: 392-5.