Postoperative analgesia after caesarean delivery under neuraxial anaesthesia in a tertiary institution north central Nigeria: An observational study

Adegboye, M.B., Josiah, C.

[1]Department of Anaesthesia, Faculty of clinical sciences, University of Ilorin, Ilorin, Nigeria
[2]Department of Anaesthesia, University of Ilorin teaching hospital Ilorin, Ilorin, Nigeria

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Corresponding author:
Adegboye, M.B.
ORCID No: 0000-0003-4957-7719
jidodedoc2000@yahoo.com

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Abstract

Objective: A retrospective study to evaluate the postoperative analgesic regimens utilized after Caesarean section (CS) under neuraxial anaesthesia. Currently, a multimodal opioid-sparing analgesic regimen is the gold standard for post-CS pain management and it includes local/regional techniques combined with scheduled nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen.
Methods: This study was conducted on parturients who underwent CS under neuraxial anaesthesia from October 2012- March 2022 in a tertiary hospital in Ilorin, Nigeria. Data extracted from 308 case folders included the patient's characteristics, comorbidities, type of neuraxial technique, and postoperative analgesic regimen. Data analysis was done using IBM-SPSS 22.
Result: The commonest post -operative analgesic combination was IV Acetaminophen+ IV pentazocine+ IM diclofenac 273 (66.2%). None of the patients received a patient-controlled analgesia (PCA), transversus abdominis plane (TAP) block.
Conclusion: Majority of the parturients received acetaminophen-opioid/NSAID combination drugs. No parturient received the current opioid-sparing multimodal analgesic regimen post-CS. The hospital requires a post-cs pain management protocol.

Analgésie postopératoire après césarienne sous anesthésie neuraxiale dans un établissement tertiaire du centre-nord du Nigéria : une étude observationnelle

Résumé
Objectif de l'étude : Étude rétrospective visant à évaluer les schémas analgésiques postopératoires utilisés après une césarienne (CS) sous anesthésie neuraxiale. Actuellement, un schéma analgésique multimodal épargnant les opioïdes constitue la référence absolue pour la prise en charge de la douleur post-CS. Il comprend des techniques locorégionales associées à des anti-inflammatoires non stéroïdiens (AINS) programmés et du paracétamol.
Méthode de l'étude : Cette étude a été menée auprès de parturientes ayant subi une césarienne sous anesthésie neuraxiale d'octobre 2012 à mars 2022 dans un hôpital tertiaire d'Ilorin, au Nigéria. Les données extraites de 308 dossiers comprenaient les caractéristiques des patientes, leurs comorbidités, le type de technique neuraxiale et le traitement analgésique postopératoire. L'analyse des données a été réalisée avec IBM-SPSS 22.
Résultat de l'étude : L'association analgésique postopératoire la plus courante était l'acétaminophène IV + pentazocine IV + diclofénac 273 IM (66,2 %). Aucun patient n'a bénéficié d'une analgésie contrôlée par le patient (ACP) ni d'un bloc du plan transverse de l'abdomen (TAP).
Conclusion : La majorité des parturientes ont reçu une association d'acétaminophène, d'opioïdes et d'AINS. Aucune parturiente n'a bénéficié du traitement analgésique multimodal actuel, épargnant les opioïdes, après une césarienne. L'hôpital exige un protocole de prise en charge de la douleur post-césarienne.
Mots-clés : Césarienne, analgésie postopératoire, analgésie multimodale, épargne d'opioïdes.

INTRODUCTION

Caesarean section (CS) is one of the oldest and most common obstetric surgical procedures that is performed by an obstetrician (1). The incidence of caesarean section varies globally from about 5% to 25% with a higher rate in the developed countries like the United States of America (2,3). In Nigeria, the rate of caesarean delivery varies from center to center with 11.3% in Sokoto,15.5% in Makurdi, 22.9% in Ilorin,23% in Zaria, and Port Harcourt 30% (4,5,6,7,8). Effective pain management is a priority for women undergoing this procedure, to reduce the incidence of persistent pain which is a risk factor for parturients to develop postpartum depression (9,10). Effective postoperative analgesia helps in optimising maternal-neonatal bonding and the successful establishment of breastfeeding after delivery. Therefore, adequate postoperative analgesia is a priority and health professionals must balance the need for adequate pain relief while minimizing the risk of analgesia-related adverse effects, because poorly controlled postoperative pain may increase the risk of long-lasting morbidities, including chronic pain and postpartum depression (9,10,11). Therefore, adequate pain relief after CS by using safe and effective analgesic modalities is a universal concern because pain relief is one of the basic human rights (12). The American Pain Society (APS) recommends that planning for postoperative pain management should begin in the preoperative period, and physicians should focus on individualising perioperative pain management using a multimodal approach (13). Multimodal analgesia is the gold standard approach for post-CS analgesia management and one of the strategies uses neuraxial morphine, scheduled non-steroidal anti-inflammatory drugs (NSAIDs), and acetaminophen and limits systemic opioids to the treatment of breakthrough pain (14,15). The addition of nonsteroidal anti-inflammatory drugs (NSAIDs) and acetaminophen further improves analgesia and reduces opioid requirements (16,17). It has also been shown that administering scheduled plain acetaminophen significantly reduces opioid consumption without the risk of exceeding the maximum acetaminophen daily dose and not compromising postoperative analgesia when compared to the use of acetaminophen-opioid combination drugs (81,19). Therefore, the current recommendation for a post-caesarean delivery analgesic regimen is an opioid-sparing, multimodal approach comprising neuraxial opioids plus scheduled NSAIDs and acetaminophen, with the addition of supplemental opioids only if needed (20,21).

Very little is known about the magnitude and the factors associated with post-CS pain in developing countries, especially Sub-Saharan Africa where multiple dimensions of challenges to access and manage postoperative pain exist. Despite the accumulating evidence supporting the use of multimodal postoperative analgesia for caesarean delivery, its utilization in a tertiary hospital in Ilorin, Nigeria has not been examined. We therefore performed a retrospective study to evaluate the post-operative analgesic regimens utilized after CS under neuraxial anaesthesia in our institution.

MATERIALS AND METHODS

Study design and setting

This was a retrospective, observational study that was conducted using a study proforma on parturients who underwent CS under neuraxial anaesthesia from October 2021 to March 2022 in the University of Ilorin Teaching Hospital.

The University of Ilorin Teaching Hospital (UITH) is located in Ilorin in Oke-Ose; Ilorin -East Local government area, which is the capital of Kwara State in the north-central region of Nigeria. The hospital provides primary, secondary, and tertiary health services to the population. It also serves as a major referral centre for all areas in Kwara State and parts of the neighboring States of Kogi, Ekiti, Osun, Oyo, and Niger. The hospital has an 8-bed ICU.

Study population and sampling methods

This was done by purposive sampling of all adult (≥18 years old) patients who had undergone elective or emergency caesarean delivery under spinal, epidural anaesthesia or combined spinal-epidural from October 2021 to March 2022 in the University of Ilorin Teaching Hospital.

Data collection

Data extracted from folders of women who had CS under neuraxial anaesthesia during the study period were collected using a study proforma. Data such as patient demographics, American Society of Anesthesiologists (ASA) physical status, type of caesarean delivery, regional anaesthetic technique, obstetric comorbidities, and postoperative analgesic details were recorded in the study proforma.

Ethical Consideration

Institutional ethics approval was obtained before the commencement of the study. The study was performed under the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. All information obtained during the conduct of the study was handled with confidentiality and used only for the study.

Data Analysis

This was a retrospective study, numerical variables were analysed and presented as frequencies and percentages, and data were analysed using the statistical product and service solution (IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY. IBM Corp).

The primary outcome measure was the postoperative analgesic regime used after CS under neuraxial anaesthesia.

RESULTS

A total of 308 folders of parturients that underwent CS under neuraxial technique within the study period were analysed and all were suitable for analysis. The mean age was 30 ±5 years. Most of the cases were performed as an emergency 240(77.9%) while electives were 68 (22.1%). Most patients were ASA II physical status 262(85.1%). (Table 1)

The commonest obstetrics co-morbidity was previous scar 105(34.1%). Most of the CS were performed with spinal anaesthesia 306 (99.4%), only epidural 1(0.3%) was used for postoperative analgesia the combined spinal epidural 1(0.3%) was discontinued after the surgery. (Table II).

The commonest post-operative analgesic combination was IV Acetaminophen+ IV Pentazocine+ IM Diclofenac 273 (88.6%) the next common multimodal combination was IV Acetaminophen+ IV Tramadol+ IM Diclofenac 10(3.2%), even though IV Pentazocine +IV Acetaminophen was 20(6.5%) but it was not a multimodal combination. Only one patient 1(0.3%) had epidural postoperative analgesia but it was not multimodal. The scheduled NSAID was given in 286(92.8%) of the parturients for the management of postoperative analgesia. Twenty-five parturients (8.1%) did not have a multimodal form of postoperative analgesia. None of the patients received a patient-controlled analgesia (PCA), transversus abdominis plane (TAP) block, or wound infusion catheter as supplementary strategies. (Table III)

DISCUSSION

In this retrospective analysis, most of the post-caesarean section analgesic regimens received by the patients were a combination of acetaminophen, opioid, and NSAID combination (66.2%). This was a multimodal regimen because a multimodal analgesic regimen should include scheduled NSAIDs and acetaminophen with opioids reserved for severe breakthrough pain (22).

This finding is different from what was reported in Northwest Ethiopia and Ugandan. Demelash et al[23] in their study in Ethiopia reported that the most commonly prescribed analgesic postoperatively for CS was intramuscular diclofenac followed by tramadol. The finding was similar to the Ugandan study and showed the underuse of multimodal analgesic regimens for postoperative CS pain in these low-income countries (23).

The American Pain Society (APS) guidelines however recommend that pharmacological agents should include a neuraxial opioid in conjunction with non-opioid adjuncts such as scheduled NSAIDs and acetaminophen, with additional opioids reserved for breakthrough pain. [13] It was suggested that intrathecal morphine should be the gold standard for post-caesarean section pain because it provides excellent and prolonged postoperative analgesia (24). Valentine et al (18) reported that for patients receiving intrathecal morphine and scheduled NSAIDs the addition of scheduled acetaminophen plus as-needed opioids, instead of acetaminophen-opioid combinations, resulted in a significant reduction in opioid consumption without affecting pain scores. Smith et al (19) also reported a 77% reduction in opioid consumption with no difference in pain scores after a similar change in practice. The Enhanced Recovery after Surgery Society and Society for Obstetric Anaesthesia and Perinatology (SOAP) recommended scheduled plain acetaminophen and NSAID in combination with neuraxial morphine (21,24). This is because it has been documented that NSAIDs have opioid-sparing effects, with a consequent reduction in opioid-related side effects (25). The combination of NSAIDs and morphine has been used extensively and NSAIDs have been shown to reduce morphine use by 33-47% (26). Another study further showed that the combined use of acetaminophen and scheduled NSAIDs resulted in a 38% reduction in the use of morphine, as compared with patients receiving acetaminophen alone (27).

Our result shows that none of our patients received a multimodal regimen that consisted of neuraxial opioid (morphine) with scheduled NSAID and acetaminophen combination. Therefore, we need to shift from acetaminophen, opioid and NASID combination to acetaminophen, scheduled NASID and neuraxial opioid (morphine) combination.

Furthermore, it is worth exploring other analgesic techniques such as PCA, TAP blocks and wound infusion catheters. In this study, we

observed that none of the patients received these analgesic modalities, because analgesic techniques like bilateral TAP and wound infusion catheters have been shown to reduce post-operative opioid consumption (28,29).

However, it is not surprising in a resource-limited setting like our centre where we lack adequate manpower and postoperative monitoring facilities and thus limit how many options can be offered to the patient by the managing team (28).

In this study, the commonest obstetrics co-morbidity was previous scar 34.1% and Demelash et al (23) proved a significant association between previous CS and postoperative pain. When there was an experience of previous CS, suffering from moderate to severe pain increased by more than 2 folds and this can be explained by increased risks of uterine dehiscence, bleeding, adhesion, and longer operating time (23).

In this study spinal anaesthesia, 99.4% was the most common neuraxial anaesthetic technique used for caesarean section. This is similar to that reported by Musaka et al (30) who reported 93.3%. Spinal anaesthesia for caesarean delivery is now being adopted worldwide because it has been associated with a reduced rate of maternal mortality (31). Also, this technique should allow the opportunity for earlier and better establishment of pain control in the post-operative recovery area, because the patients are usually awake immediately after their procedures, and regression of the spinal anaesthetic block can be assessed.

Limitations: This was a retrospective study so there was limited or no documentation on pain assessment and pain assessment tools used postoperatively.

CONCLUSION

The majority of the parturients received acetaminophen-opioid/NSAID combination drugs. No parturient received the current opioid-sparing multimodal analgesic regimen post-caesarean section. Pain severity needs to be assessed regularly and documented because it is the 5th vital sign and pain rating scales should be used. There should be an interdisciplinary approach towards pain management in patients. The hospital should have pain teams responsible for pain management that conduct regular audits to ensure that protocols for quality improvement are in place, as well as ensure better patient care.

Recommendation: We recommend that the hospital require a revised post-caesarean delivery pain management protocol.

Authors' contributions: Study design and recruitment of patients was done by MBA, CJ. The statistical analysis, results, and draft of the manuscript was carried out by MBA

Conflict of interest declaration: No conflict of interest.

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Table 1 Demographic features of the parturients

Variable	Frequency (F)	Mean ±SD	Percentage (%)
Age	-	30±5	-
Type of surgery			
Emergency	240	-	77.9
Elective	68	-	22.1
ASAPhysical status			
ASA II	262	-	85.1
ASA III	44	-	14.3
ASA IV	2	-	0.6
Parity			
Primigravid	34	-	11.0
P1	74	-	24.0
P2	67	-	21.8
P3	59	-	19.2
P4	44	-	14.3
P5	24	-	7.8
P6	6	-	0.6

ASA= American Society of Anesthesiologists, P= Parity.

Table 2: Regional anaesthetic techniques used in caesarean section

Type of regional anaesthetic used	Frequency / Percentage
Spinal	306 (99.4%)
Epidural	1(0.3%)
Combined spinal-epidural	1(0.3%)
Total	308(100%)

Table 3: Post-operative analgesic regimen in the first twenty-four hours

Drug regimen	Frequency (N)	Percentage (%)
TAB block	0	0
PCEA	0	0
PCA	0	0
Epidural + iv acetaminophen	1	0.3
iv Pentazocine + iv acetaminophen	1	0.3
im Tramal +iv acetaminophen	1	0.3
iv Pentazocine + im acetaminophen + im Diclofenac	1	0.3
im Pentazocine + iv Tramal +iv acetaminophen	1	0.3
im acetaminophen + im diclofenac	2	0.6
im Tramal +im diclofenac + iv acetaminophen	2	0.6
Im Pentazocine + im diclofenac	3	1.0
im Tramal +im Pentazocine +iv acetaminophen	6	2.0
iv Tramal + iv acetaminophen + im diclofenac	7	2.5
im Pentazocine + im acetaminophen + im diclofenac	17	5.5
im Pentazocine + iv acetaminophen	20	6.5
iv acetaminophen + iv Pentazocine +im diclofenac	42	13.6
im Pentazocine + iv acetaminophen+ im diclofenac	204	66.2
Total	308	100

TAB (transversus abdominis plane block), PCEA (Patient controlled epidural analgesia), and PCA (Patent controlled analgesia).