Original Article

Quality of Post-Cesarean Section Pain Management at Referral Hospital in Kigali Rwanda: A Cross-Sectional Study

Emmanuel Habimana Sibomana[1*], Eugene Tuyishime[2], Francoise Nizeyimana[1], Christian Mukwesi[1], Jean de Dieu Tuyishime[1], Bould M. Dylan[3], Theogene Twagirumugabe[4]

[1]*Anesthesia and Critical care, Centre Hospitalier Universitaire de Kigali, Kigali, Rwanda*
[2]*Anesthesia and Critical Care, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda*
[3]*Anesthesiology and Pain Medicine, University of Ottawa*
[4]*Anesthesia And Critical Care, Centre Hospitalier Universitaire de Butare, Butare, Rwanda*

***Corresponding author:** Emmanuel Habimana Sibomana. Anesthesia and Critical Care, Centre Hospitalier Universitaire de Kigali, Kigali, Rwanda. Email: emmanuelhabi2000@gmail.com. ORCID: https://orcid.org/0009-0006-3023-4299

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Abstract

Background
Studies in high-income settings have demonstrated that pain management after Cesarean section leads to higher patients' satisfaction. However, little is known about the quality of pain management and patients' satisfaction among parturients undergoing cesarean in low resources settings.

Methodology
A cross-sectional study was conducted for 385 parturients from May 2020 to October 2020 at a referral hospital in Kigali Rwanda. The sample size was calculated: $S= Z^2 \times P\times (1-P)/M^2$. $S= (1.96)2 \times 0.5\times (1-0.5)/ (0.05)2 =384.16\approx385$. Parturients aged over 18 years who underwent cesarean were enrolled prior to surgery and followed up within the first 24 hours post cesarean. Data on patients' characteristics, type of analgesia, type of anesthesia, pain scores, and patients' satisfaction were collected and analyzed.

Results
Age group 26-33 years 199(51.7%) underwent cesarean section and 201(52, 2%) were elective cesarean section; 361 (93.8%) received spinal anesthesia. Most patients had pain control with low pain scores throughout the first 24 hours 90.1% except immediately after recovery admission 46.8% and 76.1% were satisfied. Morphine was associated with higher patients' satisfaction.

Conclusion
The quality of post cesarean section pain management within 24 hours at hospital is good leading to satisfaction among most patients. However, the quality of pain management was lower after leaving the theatre compared to other post-operative periods; this requires intrathecal morphine which was not used.

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Keywords: Cesarean section, pain management, patient satisfaction

Introduction

Cesarean section (CS) is a common surgical procedure requiring adequate pain management.[1] There are common pain management modalities which have shown to provide better pain management and great patient satisfaction.[2] These modalities include a multimodal approach using opioids, non-steroidal anti-inflammatory drugs, local anesthetists, intrathecal opioids and non-pharmacological techniques (yoga and music).[3, 20] Multiple studies have been conducted to evaluate the quality of pain management in low resources settings showing different challenges including culture, lack of trained staff, lack of pain medicine.[3]

Few studies have evaluated the patients' satisfaction after CS pain management in low resources settings. One study done in Nigeria in 2009, found that 95% of C-section patients who underwent general anesthesia had moderate to severe pain scores immediately after surgery,[4] whereas in Kenya, 60% of mothers reported moderate to severe pain postoperatively after C-section under general anesthesia at Kenyatta national hospital.[4] Similarly, a study done in Uganda demonstrated mild pain score after transversus abdominis plane block (TAP block) for only 44% of post CS patients.[5]

To our knowledge, there are no studies done to evaluate pain management and patient's satisfaction after C- section in Rwanda. Therefore, this study has the following objectives: 1) to describe the types of analgesia used among parturients undergoing CS at referral hospital in Kigali Rwanda, 2) to evaluate pain scores and level of satisfaction among parturients undergoing CS at the referral hospital, and 3) to determine patients' satisfaction according to the type of anesthesia and analgesia used for parturients undergoing CS at the referral hospital.

Methods

Study design and setting

This study was conducted at a referral hospital in Kigali , Obstetrics and Gynecology department from May 2020 to October 2020. The referral hospital is one of the main referral hospitals in Rwanda. It has 350 beds, 60 of which are dedicated to the Gynecology and obstetrics Department.

Population

The research was conducted on 385 mothers above 18 years undergoing elective or emergency CS between May 2020 and October 2020 at hospital. All parturients above 18 years admitted in postoperative wards within 24 hours after CS were included in this study. Young patients (less than 18 years), patients with decreased level of consciousness, and patients admitted to Intensive care Unit (ICU) were excluded from this study.

The sample size was calculated using the formula: $S= Z^2 \times P\times (1-P)/M^2$

$S=(1.96)^2\times 0.5\times (1-0.5)/(0.05)^2=384.16\approx 385.$

Data collection

Data was collected by two trained medical students from patient files and interviews with participants within 24 hours after cesarean section where researchers collected information including demographic features, previous cesarean section, cesarean indication, type of anesthesia (general or spinal anesthesia), type of analgesia given preoperatively and intraoperatively, type of analgesia given postoperatively, duration of surgery, maternal satisfaction, and pain score. The collection of data was done using pre-designed questionnaire.

A numerical scale (0 − 3: no pain to mild pain, 4 − 6: moderate to severe pain, 7− 10: very severe to worst pain) which is a validated international tool used for assessment of pain was used to assess pain after C- section.[6]

Statistical analysis

Descriptive statistics were used to describe patients' characteristics with data presented in proportions. The comparison between groups was done by using the Chi-2 test. The software of SPSS v.20 contributed in statistical testing. A $p<0.05$ was considered as statistically significant.

Ethical considerations

Ethical clearance was obtained from Institutional Review Board of the college of medicine and health sciences (IRB – CMHS. No.001/CMHS IRB/2020). Also, permission was received from research committee of the hospital prior to data collection. Signed consents were obtained from all participants and accessed by only principle investigator using identification number.

Results

Baseline characteristics

The 385 parturients who had undergone CS at the hospital were included in this study. Most participants were in the age group 26-33 years (199, 51.7%), had undergone elective CS (201, 52.2%), and had had spinal anesthesia with 8-10mg of Marcaine 0.5% hyperbaric plus fentanyl 15-20mcg (361, 93.8%). Most of CS was performed on parturients with no previous scar (189, 49.1%) and the duration of procedure between 30 and 60min (232, 60.3%).

Table1. Baseline characteristics of the study participants

Variables	Frequency(n=385)	Percentage
Age		
18-25	126	32.7
26-33	199	61.7
34-41	36	9.4
41-above	24	6.2
Previous CS		
None	189	49.1
One previous scar	37	9.6
Two previous scar	9	2.3
Two previous scar/adhesions	45	11.7
Three or more previous scar/ adhesions	105	27.3
Duration		
30-60min	232	60.3
60- 120 min	141	36.6
> 120 min	12	3.1
Type of Anesthesia		
General	24	6.2
Spinal anesthesia (Marcaine 0.5% hyperbaric 8-10mcg + Fentanyl 15-20mcg).	361	93.8
Indication of CS		
Elective (Previous scar)	201	52.2
Emergency (fetal distress , cord prolapse , failure of progress, etc	184	47.8

Type of analgesia used for post CS pain management

Table 2.Type of analgesia used for post CS pain management (n= 385)

Variables	Frequency(n: 385)	Percentage
Preemptive and intraoperative analgesia		
Paracetamol per os preoperatively	24	6.2
Spinal +Intrathecal morphine	3	0.8
Spinal +Intrathecal fentanyl	355	92.2
Spinal with no additive	3	0.8
Postoperative analgesia		
TAP block	6	1.6
Local wound infiltration	46	11.9
Morphine IV injection	150	39
Diclofenac IM injection	360	93.5
Paracetamol IV injection	325	84.4
Others: Pethidine, tramadol	126	32.7

Most participants received spinal analgesia with intrathecal fentanyl (92.2%), diclofenac IM (93.5%), paracetamol IV (84.4%), and morphine IV (39%).

Quality of post CS pain management at the hospital
Pain scores

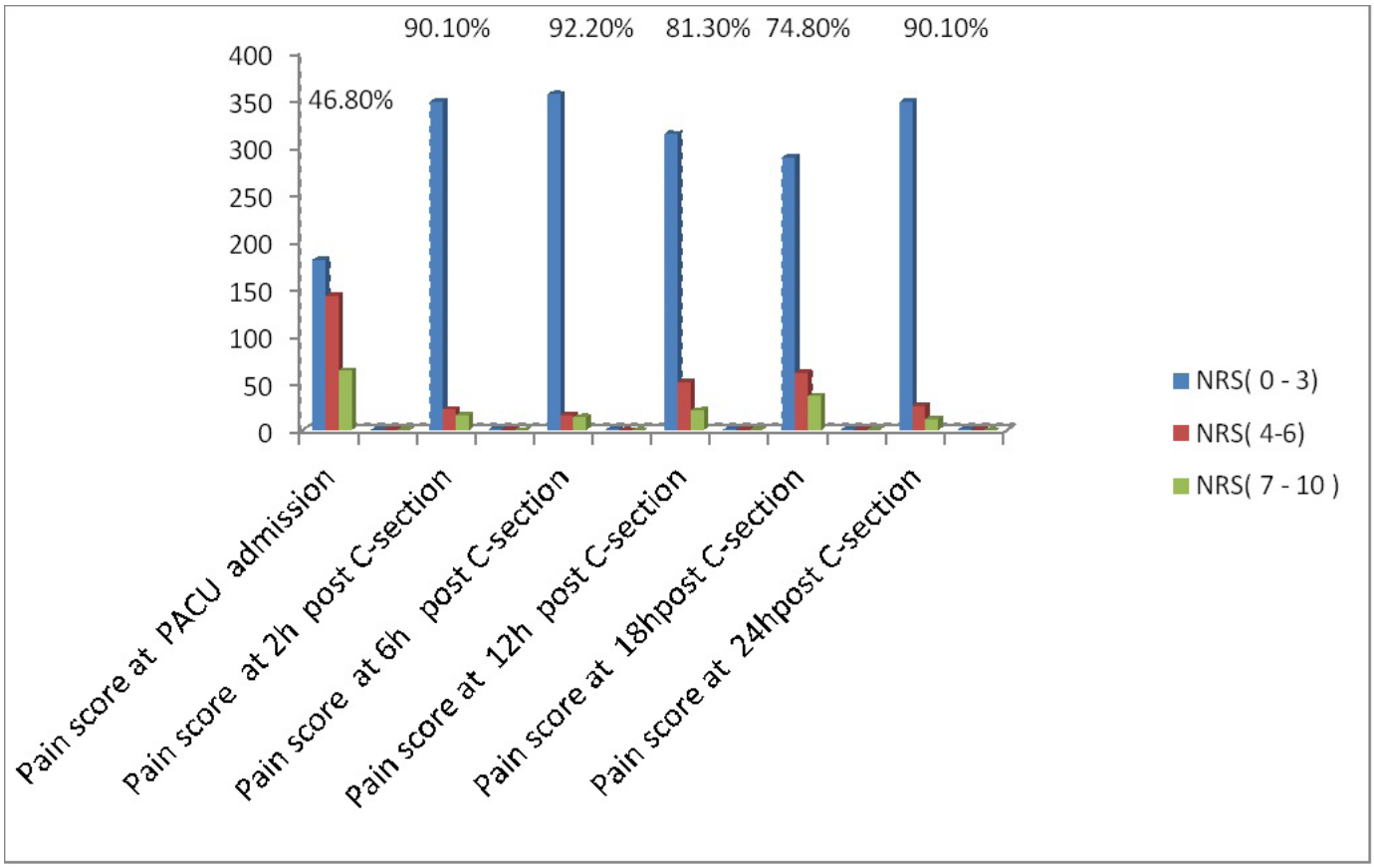

Figure 1. Pain score related to pain management after c- section

A numerical scale used for assessment of pain was used to assess pain of the 385 patients after C- section. Each patient had pain score recorded at different times within the 24 hours following surgery. At PACU admission, patients reported no pain – mild pain 180 (46.8%), moderate – severe pain 142 (36.9%), very severe – worst pain 63(16.3%).

At 2 hours post C-section, patients reported no pain – mild pain 347(90.1%), moderate – severe pain 22 (5.7%), very severe – worst pain 16(4.2%). At 24h post C-section, patients reported no pain – mild pain 347(90.1%), moderate - severe pain 26 (6.8 %), very severe – worst pain 12(3.1%).

Patient satisfaction after post CS pain management at the hospital

Most participants 293 (76.1%) were satisfied with their pain management at 24 hours post CS.

Patients' satisfaction by type of analgesia

We found a significant association between receiving IV morphine (p: <0.001) or Pethidine and/or tramadol (p: 0.015) and being satisfied of pain management among mothers underwent C-section.

Table 3. Patients' satisfaction by type of anesthesia and analgesia

Variables	Satisfaction (n:293)	Dissatisfaction(92)	P-Value
Type of anesthesia			
General	21(7.20%)	3(3.30%)	0.142
Neuraxial: spinal	272(92.80%)	89(96.70%)	0.142
Pre-operative & intraoperative analgesia			
Paracetamol per os preoperatively	20(6.80%)	4(4.30%)	0.516
Intrathecal morphine	2(0.70%)	1(1.10%)	0.516
Intrathecal fentanyl	269(91.80%)	86(93.50%)	0.516
Spinal Anesthesia only	2(0.70%)	1(1.10%)	0.516
Postoperative analgesia			
TAP block	3(1%)	3(3.30%)	0.151
Surgical Wound infiltration	40(13.70%)	6(6.50%)	0.068
Morphine IV injection	129(44%)	21(22.80%)	**0.001**
Diclofenac IM injection	274(93.50%)	86(93.50%)	0.577
Paracetamol IV injection	248(84.60%)	77(83.70%)	0.869
Others: Pethidine, tramadol	117(39.90%)	9(9.8%)	**0.015**

Discussion

In this cross-sectional study, we found that the quality of post CS pain management was good based on parturients satisfaction level of 76.1% and pain control with low pain score after 24hours. Most participants had undergone CS under spinal anesthesia (92.2%) with intrathecal fentanyl, but, intrathecal morphine was rarely used. This may be explained by the fear of delayed respiratory depression especially that there are limited human and technical resources for monitoring.

There is evidence to support the use of intrathecal opioids as an effective method to achieve adequate analgesia post CS.[7,8,11,13]

However, neuraxial anesthesia with bupivacaine without adjuvant does not provide extended analgesia in the postoperative period.[10,14] Therefore, a combination of intrathecal fentanyl and intrathecal morphine should be considered with a benefit to prolonge analgesia with relatively rapid onset.[12]

In addition, the combination of non-opioid analgesia and very small doses of intrathecal morphine can provide effective analgesia after C- section that save time and money.[14] Similarly, the combination of diclofenac and paracetamol has demonstrated effective pain management due to their different mechanisms and site of action.[15,16]

In our study we found that the common types of analgesia used post-operatively include diclofenac IM (93.5%), paracetamol IV (84.4%), and morphine IV (39%). TAP block contributes in both regional anesthesia and postoperative pain management after cesarean section. It decreases postoperative pain scores and opioids consumption during cesarean section.[18] Surgical wound infiltration after cesarean section is performed to provide postoperative analgesia in low income countries. It is used as an adjunct to general and regional anesthesia by reducing opioid consumption.[19] The results of our study showed a low practice of TAP block and surgical wound infiltration resulting to low skills and experience of health care providers at the hospital. When asked about their satisfaction with pain management at 24 hours post CS, most patients (76.1%) were satisfied. Using IV opioids like morphine and pethidine was associated with higher patients' satisfaction. During this study, the assessment of maternal satisfaction was achieved by direct interview and pain assessment using a numerical rating scale as recommended by Morgan P, et al, who showed that patient satisfaction during or after C- section can be assessed by asking women to rate their satisfaction based on visual analogue scale, numerical rating scale or to assess other factors including the quality of pain relief or side effect.[6, 17]

There are multiple limitations to consider while interpreting the results of this study. First, this is a single center study, the results may not be generalizable to other hospitals with different settings. In addition, few factors were considered while assessing patients' satisfaction, some of factors may have been missed. A qualitative study may be able to explore in detail the level of satisfaction of patients after CS. More studies are needed before providing recommendations about ways to improve the quality of post CS pain management and patients' satisfaction.

Conclusion

The results of this study found that the quality of post CS pain management within 24 hours at the hospital is good leading to adequate satisfaction among most patients. However, the quality of pain management was lower in PACU immediately after leaving the OR when compared to other post operative periods; this needs special attention like considering the use of intrathecal morphine which was not routinely used. Further studies are needed to explore the quality of post CS pain management beyond 24 hours up to 72 hours and to include more hospitals.

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Authors' contributions
EHS and ET led the study design, protocol development, data analysis and manuscript writing. GN, FN, CM, and JDT contributed to study design, protocol development and results interpretation. EHS and TT led and supervised data collection and led data.

Conflict of interest
None

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