

Case Series: Efficacy of Local Infiltration Analgesia with Lidocaine 0.5% and Adjuvant Epinephrine as Post Cesarean Section Pain Management in Kalabahi Public Hospital



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ABSTRACT

Background: A caesarean section is one of the most commonly performed surgical operations in the world today. Caesarean section commonly induces moderate to severe pain for about 48 hours and therefore requires optimal perioperative pain management. Postoperative pain management is an important issue in the clinic. Proper and efficient pain management is necessary during hospitalization for preventing the related complications which could affect the mother and neonate health status. Recently, multimodal pain management has been tested for postoperative pain management. One of the alternatives that can be used is local infiltration analgesia (LIA) method. The LIA technique can provide an adequate effect of analgesia and reduced parenteral opioid consumption without any adverse effects.

Case Presentations: Cases were taken from Kalabahi Public Hospital, East Nusa Tenggara, Indonesia. A total of 42 patients who met the inclusion criteria that underwent cesarean section were injected with lidocaine 0.5% with epinephrine in the abdominal muscle and subcutaneous layer as postoperative pain management. The patients were observed to evaluate pain score with the Visual Analogue Scale (VAS), opioid consumption as the pain rescue, the level of satisfaction, and to evaluate post-cesarean wound.

Conclusion: Administration of lidocaine 0.5% with epinephrine reduced postoperative pain leading to early mobilization and increased patient satisfaction. There was no report of wound complication. The pain score of the first 24 hours was 2.095238 with standard deviation 0.878178, and just 4 of 42 patients asked for rescue analgesic.

Keyword: local infiltration analgesia, visual analogue scale, local anaesthetic

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INTRODUCTION

Caesarean section is a surgical procedure to deliver the fetus through a abdominal and uterus incision.¹ Caesarean section is one of the most commonly performed surgical operations in the world today.² The World Health Organization (WHO) recommend 5-15% caesarean section for one country.³ According to Riskesdas, the proportion of caesarean section in the East Nusa Tenggara Province is less than 5%.⁴ The Kalabahi Public Hospital reported about 374 cases of caesarean section in 2016 (32 cases per month).

A caesarean section commonly induces moderate to severe pain for about 48 hours and therefore requires optimal perioperative pain management.⁵ Recent studies mention caesarean section as a cause of chronic pain, representing a significant problem in 6-12% of patients 10 months after the procedure.^{6,7} Independent of the presence of other conditions such as pelvic adhesions, endometriosis, sequelae of pelvic inflammatory disease, leiomyoma and pelvic varices. Methods: Retrospective case-control study conducted on 199 patients consecutively

admitted from January 1998 to January 2000, 116 of them submitted to laparoscopy for the diagnosis of chronic pelvic pain and 83 asymptomatic patients submitted to tubal ligation by laparoscopy. A logistic regression analysis was used to verify the association between chronic pelvic pain and the history of previous caesarean section. Results: In women with chronic pelvic pain, a history of caesarean section was observed in 67.2% of cases, adhesions in 51.7%, endometriosis in 33.6%, sequelae of pelvic inflammatory disease in 31.9%, leiomyoma in 6.9% and pelvic varices in 11.2%. In asymptomatic women, a history of caesarean section was observed in 38.5%, adhesions in 24.1%, endometriosis in 9.6%, sequelae of pelvic inflammatory disease in 4.8%, leiomyoma in 7.2% and pelvic varices in 3.6%. In a logistic model, chronic pelvic pain was associated with a history of caesarean section (O.R.=3.7 Post-caesarean section pain can delay the recovery, contact of mother and neonate, and also inhibit the daily activities. Optimal postoperative pain management can reduce the length of hospital stay and improve the

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rehabilitation post-caesarean section.⁵ Postoperative pain management is an important issue in the clinic. Proper and efficient pain management is necessary during hospitalization and can prevent caesarean section related complications which could affect breastfeeding, mother health status and neonate health status.⁸

Multimodal pain management is one pain management strategy. Multimodal pain management potentiates to reduce perioperative morbidity, length of hospital stay, and to improve the level of satisfaction. The traditional and most widely used form of pain management is a parenteral opioid. Intravenous patient-controlled analgesia (IV-PCA) is now widely used in clinical practice and is among the most recommended techniques for the control of moderate to severe postoperative pain.^{5,9,10} Even IV-PCA is superior to opioid injection. Patients still experience the side effects of opioids, like nausea and vomiting, pruritus, decrease of gut motility, sedation, respiratory depression, confusion, and have a significant transfer to breastmilk that may have a sedative effect on the baby.^{2,11}

The alternative to overcome this problem is local infiltration analgesia (LIA) method. The LIA technique may provide adequate analgesia while limiting the use of parenteral opioids and their side effects. It not only controls pain adequately but also lowers overall opioid consumption and reduces the length of stay in the hospital.¹² Improves patient satisfaction, and may reduce the hospital stay. We investigated the analgesic effect of a locally injected mixture of drugs, in a double blinded RCT in 80 primary TKA. They were randomized either to receive a periarticular mixture of drugs containing bupivacaine, ketorolac, morphine, and adrenalline or to receive normal saline. Visual analog scores (VAS Wound infiltration with local anaesthetics is a simple, effective and inexpensive means of providing good analgesia for a variety of surgical procedures without any major side effects.¹³ The technique involves the infiltration of a large volume dilute solution of a local anaesthetic agent, often with adjuvants (e.g., epinephrine, ketorolac, opioid), throughout the wound at the time of surgery. The addition of epinephrine has been reported to improve the onset, duration, intensity of pain while decreasing plasma concentrations of local anaesthetic responsible for systemic toxicity.¹⁰ This case series reports on the LIA procedure as post caesarean pain management. Our aim was to decrease recovery time without side effects and also to decrease narcotic use.

CASE REPORT

This was a case report of 42 patients who underwent elective or emergency caesarean sections in

Kalabahi Public Hospital. The criteria included gravid woman between 20-45 years old, elective or emergency caesarean section, weight between 50-80 kg, and minimum education level of high school. Patients with comorbidity and contraindication for spinal anaesthesia were excluded.

All caesarean sections were performed by the same surgeon. Caesarean sections were performed with a transversal lower segment incision. The anaesthesia method was spinal anaesthesia in all cases with 12.5 mg bupivacaine heavy 0.5% using a 25-G spinal needle injected as high as L4-L5.

All patients were injected with Lidocaine Compositum® (Lidocaine HCl 2% 20 mg/mL and Epinephrine 0.0125 mg/mL) maximal dosage 7 mg/kg, the solution was diluted to 10 mL until the concentration of lidocaine became 0.5%. The solution was infiltrated in the abdominal muscle and subcutaneous layer with 10 cc solution. Wound infiltrations were performed by the surgeon at the end of surgery before closing the skin.

Data recorded include visual analogue scale (VAS), opioid consumption, and wound complication. The visual analogue scale for pain was described to all patients before the operation and they were asked to estimate their postoperative pain between 0 and 10 (0=No pain; 1-3 = Mild; 4-5 = Moderate; 6-9 = Severe; 10 = the most pain imaginable). The other results to assess in this study were the opioid consumption as the analgesia rescue, the level of satisfaction 24 hours after the surgery, and wound complications.

All patients were evaluated for 24 hours after surgery as below: the first 2 hours, 4 hours, 8 hours, 12 hours, 16 hours, and 24 hours after the procedure. During the first 2 hours, the patients were observed in the Post Anaesthesia Care Unit (PACU), and after that patients were observed in the Department of Obstetrics and Gynecology. Patients received Paracetamol 10 mg/kg/dose orally every 6 hours and Ketorolac 30 mg intravenously every 8 hours. If during the observation, the VAS increased to greater than 5, the patient received Pethidine 0.5 mg/kg intravenously as a rescue analgesia.

The patient mean age was 30.6 ± 6.29 years and the mean weight was 65.5 ± 7.45 kg. The body mass index mean was 25.9 ± 2.4 kg/m². There was no significant result of the duration of the surgery, which was 67.5 ± 9.3 mins. The length of hospital stay had little difference between each patient, the mean was 2.0 ± 1.2 days (Table 1).

All patients received lidocaine 0.5% with epinephrine that was infiltrated in the abdominal muscle and subcutaneous layer at the end of procedure as the postoperative pain management

According to the data, after the infiltration with lidocaine 0.5% with epinephrine in the abdominal

muscle and subcutaneous layer, the peak of pain was after the first 4 hours at 2.95 ± 1.43 . This was significant because occurred at the first 4 hours regression of neuraxial anaesthesia block. At that time, patients asked for rescue analgesia (Pethidine 0.5 mg/kg).

The level of satisfaction was evaluated after 24 hours by interviewing the patient using the patient satisfaction questionnaire.¹⁴ The results showed that 54.8% patient were satisfied and 11.9% patient were less satisfied (Figure 1). There were no reports of wound infection or postoperative hematoma during the hospitalization.

DISCUSSION

Lidocaine 0.5% with adjuvant epinephrine infiltration in the abdomen muscle and subcutaneous layer can reduce the pain score, the need for opioid analgesia and improve the level of satisfaction without any significant adverse effects.

Lowenstein et al. confirmed that infiltration with lidocaine 1% has a significant and beneficial effect on pain perceived by women in the first 8 hours post-hysterectomy.⁹ Almost all local anaesthesia agents can be effective for wound infiltration, but long-acting and less toxic agents are preferred. Zink et al. reports that bupivacaine is effective in the most severe muscle damage after serial or continuous intramuscular administration.¹⁵

The addition of epinephrine to local anaesthetic solutions decreases vascular absorption of local anaesthetics thus, maintaining effective anaesthetic concentrations for more prolonged periods. Decreased vascular absorption also serves to limit systemic uptake and reduce the risk for systemic toxicity from the local anaesthetic.¹⁰ Epinephrine causes vasoconstriction at the site of administration. Vasoconstrictors have more pronounced effects on shorter-acting than longer-acting anaesthetics. Addition of epinephrine to lidocaine usually extends the duration of anaesthesia by at least 50%.¹⁶ A local anaesthetic solution with epinephrine given at the end of surgery may provide sufficient post-operative analgesia lasting for 16 to 20 hours.¹⁷ This LIA/Algesia technique did not produce any wound complications.

Sekhvat et al. showed that infiltration with 2% lidocaine has a significant and beneficial effect on pain perceived by women in the first 6 hours post-caesarean delivery. The average pain scores in the lidocaine group was lower than 40 mm, while average pain scores in the placebo group was higher than 60 mm.¹⁸ Bamigboye et al. confirmed that women who underwent cesarean section under regional anaesthesia and had wound infiltration had a decrease in morphine consumption at 24 hours compared with the placebo.² Minimizing pain after cesarean section is best achieved using a multimodal approach. Various routes of administration have been tested, such as subcutaneous wound infiltration, infiltration through all abdomen layers, continuous wound instillation or nerve blocks. Local anaesthesia has been used alone and in combination with NSAIDs or ketamine.²

CONCLUSION

LIA with lidocaine 0.5% with adjuvant epinephrine was administered to post-caesarean section patients

Table 1 Patient's Characteristic*

Variable	N = 42 sample
Age (years)	30.6 \pm 6.29
Weight (kg)	65.5 \pm 7.45
Body mass index (kg/m ²)	25.9 \pm 2.4
Duration of surgery	67.5 \pm 9.3
Length of hospital stay	2.0 \pm 1.2

*Data was presented in median \pm standard deviation (SD)

Table 2 Visual Analogue Scale*

Variable	N = 42
VAS first 2 hours	2.02 \pm 1.2
VAS first 4 hours	2.95 \pm 1.43
VAS first 8 hours	2.92 \pm 0.93
VAS first 12 hours	2.73 \pm 0.83
VAS first 16 hours	2.56 \pm 0.89
VAS first 24 hours	2.09 \pm 0.88

*Data was presented in median \pm standard deviation (SD)

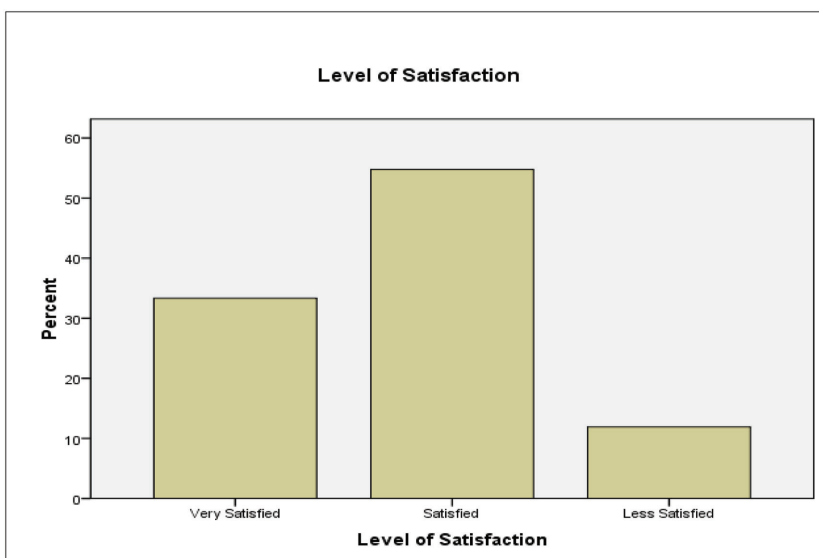


Figure 1 Satisfactory level

to reduce postoperative pain, opioid consumption and improved the level of satisfaction without any adverse effects. This report can be utilized by medical personnel to reduce pain levels in post-caesarean section patients and reduce the need for opioid drugs that are said to pass through milk and accelerate mobilization.

Further research with a larger sample and more time is needed to compare the efficacy of LIA with other analgesics.

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