

Research Article

Ultrasound-Guided Quadratus Lumborum Block Using Bupivacaine versus Bupivacaine-Dexamethasone for Postoperative Analgesia in Laparoscopic Cholecystectomy

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Abstract

Introduction: Laparoscopic cholecystectomy (LC) is a proven, gold standard surgical procedure for management of gallbladder stones. **Patients and Methods:** After ethical committee approval and written informed consent was obtained from all patients, this prospective randomized double blinded controlled study was carried out at El-Minia University Hospital during the period from March 2018 to December 2018. A total of 90 patients of either sex, their age ranged from 18-60 years, American society of anesthesiologists class I or II were scheduled for elective laparoscopic cholecystectomy surgery under general anesthesia. **Results:** A total of 100 patients were enrolled in this study, 10 patients refused to participate, five patients (two patients in group D and three patients in group B) were excluded from study due to conversion of the operation into open cholecystectomy and replaced by other patients, 90 patients were randomized into three groups (n=30). **Discussion:** Laparoscopic cholecystectomy is gold standard surgery for symptomatic gall stone disease which is the commonest disease needs surgical management. Laparoscopic cholecystectomy offers various advantages over open cholecystectomy like short duration of hospital stay, better recovery, lesser morbidities and less postoperative pain. **Recommendation:** Based on the current study, Quadratus lumborum block is recommended as effective, safe and easy technique for post-operative analgesia in laparoscopic cholecystectomy. Further studies probably are required on a larger sample size to confirm our results. Future studies may be needed to assess pain beyond 24 hours

Keywords: Laparoscopic cholecystectomy, gallbladder stones

Introduction

Laparoscopic cholecystectomy (LC) is a proven, gold standard surgical procedure for management of gallbladder stones. Early and easily recovery, less operative morbidities, less postoperative pain, earlier return of bowel function, improved cosmetics, an earlier return to full activity, less hospitalization day and decreased overall cost are the superiorities of laparoscopic cholecystectomies comparing with open surgical procedures (Rubert et al., 2016).

Despite of these clear benefits, pain is still considered as the most common complaint and the reason of prolonged hospital stay. Duration of convalescence after non-complicated laparoscopic cholecystectomy may depend on several factors, of which pain, fatigue, and sociocultural factors are the most important ones. Pain and fatigue are most intense on the day of operation and the following day. Nausea and vomiting occur mainly on the day of operation and only rarely contribute to

prolonged convalescence (David and Wartier, 2006).

The aim of the present study was to compare the effectiveness of transmuscular Quadratus Lumborum block using Bupivacaine versus Bupivacaine- Dexamethasone in providing analgesia in patients undergoing laparoscopic cholecystectomy.

Patients and Methods

After ethical committee approval and written informed consent was obtained from all patients, this prospective randomized double blinded controlled study was carried out at El-Minia University Hospital during the period from March 2018 to December 2018. A total of 90 patients of either sex, their age ranged from 18-60 years, American society of anesthesiologists class I or II were scheduled for elective laparoscopic cholecystectomy surgery under general anesthesia.

Exclusion criteria:-

- Patient refusal.
- Hematological diseases
- Bleeding disorders.
- Coagulation abnormality.
- Psychiatric diseases.
- Local skin infection.
- Sepsis at site of the block.
- Known allergy to the study drugs.
- Body Mass Index > 40 Kg/m².
- Emergency laparoscopic cholecystectomy.
- If laparoscopic procedure converted to open.
- Major organ dysfunction.
- Pregnant.
- Known alcohol or medical abuse.

Preoperative assessment and preparation:

Preoperative assessment was done for the patients by taking careful medical history, and performing general and physical examination

including blood pressure, heart rate, respiratory rate, chest, heart and abdomen. Then, routine and relevant investigations were carried out such as complete blood picture, renal and liver function tests, random blood sugar, and electrocardiogram were performed and analyzed in detail prior to procedure. Proper explanation of the visual analogue pain scale (VAPS) was done, VAPS consists of a straight vertical 10 cm line; the bottom point (0 cm) represents no pain and the top (10 cm) represents the worst imaginable pain. Patients were fasted for 6 hours for solid foods and 2 hours for water and clear liquids.

Results

A total of 100 patients were enrolled in this study, 10 patients refused to participate, five patients (two patients in group D and three patients in group B) were excluded from study due to conversion of the operation into open cholecystectomy and replaced by other patients, 90 patients were randomized into three groups (n=30)

Time of first analgesic request (hr) , Total analgesic requirement (Nalbuphine),frequency. Data are summarized as Mean±SD and number and percentage

| Variables | Group D (n=30) | Group B (n=30) | Group C (n=30) | p value | | |
|--------------------------------------|-------------------|-------------------|-------------------|------------------------|-------------------------|-------------------------|
| | n (%) | n (%) | n (%) | | | |
| Time of first analgesic request (hr) | | | | (#bc) | | |
| | 18±4 | 14±6.3 | 0.8±0.4 # | <i>D vs B</i> 0.186 | <i>D vs C</i> <0.001 | <i>B vs C</i> <0.001 |
| Nalbuphine dose | | | | (#bc) | | |
| | 9±1.4 | 14.4±10.4 | 31.7±6.8 # | <i>D vs B</i> 0.366 | <i>D vs C</i> <0.001 | <i>B vs C</i> <0.001 |
| Frequency: | | | # | (#bc) | | |
| 1 dose | 2 (6) | 5 (16.66) | 0 (0) | 1.000 | 0.002 | <0.001 |
| 2 doses | 0 (0) | 3 (10) | 0 (0) | | | |
| ≥3 doses | 0 (0) | 1 (3.33) | 30 (100) | | | |

- *D:dexamethasone-bupivacaine, B:bupivacaine, C:control*
- *#: Significant difference between groups at p value < 0.05*
- **:Significant difference within each group at p value < 0.05*
- *a:comparison between groups D&B.*
- *b: comparison between groups D&C.*
- *c: comparison between groups B&C.*

Discussion

Laparoscopic cholecystectomy is gold standard surgery for symptomatic gall stone disease which is the commonest disease needs surgical management. Laparoscopic cholecystectomy offers various advantages over open cholecystectomy like short duration of hospital stay, better recovery, lesser morbidities and less postoperative pain (Khedkar et al., 2017).

However postoperative pain after laparoscopic cholecystectomy remains an issue, it can prolong hospital stay and leads to increase morbidity, it is affected by several factors including patient demographics, nature of underlying disease, surgical factors such as rupture of blood vessels caused by rapid distension of the peritoneum, traumatic traction on the nerves, trauma to the abdominal wall during port insertion, volume of residual gas, type of gas used for pneumoperitoneum, and the pressure created by the pneumoperitoneum (Sarvestani et al., 2013).

Post laparoscopic cholecystectomy pain is multifactorial and methods for short-term analgesia cannot improve postoperative functions or shorten hospitalization (Readman et al., 2004). So, multimodal efforts like parenteral non-steroidal anti-inflammatory drugs and opioids have been done to reduce overall pain, but in spite of their efficacy, all parenteral medications are associated with adverse effects (El-labban et al., 2011).

Where routine use of systemic NSAIDs may produce adverse side effects, such as gastric bleeding, renal impairment, or increased bleeding, caused by inhibition of platelet activity (Elhakim et al., 2000).

Also parenteral opioids for post-operative analgesia have recently been critically challenge because of the development of tolerance or opioid-related side effects such as nausea, vomiting, sedation, depression of brainstem control of respiratory drive, hypotension and urinary retention (Delaney et al., 2005).

Multimodal analgesia strategies with different classes of analgesics or local anesthetics may enhance pain relief and reduce side effects after surgery (Buvanendran et al., 2009).

Recommendation

Based on the current study,

1. Quadratus lumborum block is recommended as effective, safe and easy technique for post-operative analgesia in laparoscopic cholecystectomy.
2. Further studies probably are required on a larger sample size to confirm our results.
3. Future studies may be needed to assess pain beyond 24 hours

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