Journal of Cardiovascular Disease Research

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

Levobupivacaine and Ropivacaine in Transversus Abdominis Plane block for postoperative analgesia in gynaecological surgeries

Authors

Dr Bishnu Prasad Mohapatra[1],Dr Radhakanta Panigrahi[2], Dr Debabrata Panda[3] , Dr. Susajit Kumar Pradhan[4] ,Dr Manisha Mund[5], Dr Ranjita Baksi[6]

[1] Associate Prof, Department of Anaesthesiology and critical care,MKCG Medical College & Hospital, Berhampur

[2] Associate Prof, Department of Obstetrics and Gynaecology. S.L.N Medical College & Hospital,Koraput

[3,4,5,6] Assistant Prof. Department of Anaesthesiology and critical care, SCB Medical College & Hospital, Cuttack

Corresponding Author- Dr. Susajit Kumar Pradhan. Asst. Prof. Department of Anaesthesiology and critical care, SCB Medical College & Hospital, Cuttack, Odisha, India

Abstract

Aim- Patients undergoing gynaecological surgeries suffer significant postoperative pain. Recent studies have shown that, the transversus abdominis plane (TAP) block can be used to provide adequate post operative analgesia to the anterior abdominal wall. We studied the analgesic potency of the transversus abdominis plane block using levobupivacaine and ropivacaine in patients undergoing gynaecological surgery.

Methods – Sixty patients scheduled for elective gynaecological surgeries were randomized to undergo TAP block with 0.25% levobupivacaine (n-30) versus 0.375% ropivacaine (n-30). All patients received subarachnoid block using intrathecal bupivacaine. After completion of surgery bilateral TAP block (ultrasound guided) was performed using 1 mg/kg levobupivacaine or ropivacaine (to a miximal dose of 100 mg) on each side. Each patient in both groups were assessed postoperatively in the postanaesthesia care unit at 2, 4, 6, 12, 24, 36, 48 h postoperatively.

Results – The transversus abdominis plane block using levobupivacaine decreased the postoperative visual analogue scale pain scores in comparison to ropivacaine. Amount of rescue analgesia required and incidence of

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

postoperative nausea and vomiting was found less with levobupivacaine in transversus abdominis plane block compared to ropivacaine.

Conclusion – Levobupivacaine in transversus abdominis plane block decreased post operative analgesic requirement and provided prolonged postoperative analgesia after gynaecological surgery

Key words – Gynaecological surgery, postoperative analgesia, transversus abdominis plane block

Introduction

Postoperative pain after gynaecological surgeries can produce acute and chronic psychological effects. So optimization of postoperative analgesia through different regional blocks and pharmacological agents can decrease complications and facilitate recovery.[1] Reduction of pain in post operative period is important to provide early ambulation, decrease the chance of paralytic ileus, increase enteral motility, decrease hospital stay. Inadequate postoperative pain relief in gynaecological surgery can negatively impact ambulation thereby increasing chances of DVT and aggravating other co morbidities.[2] The efficiency of transversus abdominis plane block in several abdominal surgeries has been confirmed.[3-4] Transversus abdominis plane block is ideal for postoperative analgesia in patients undergoing lower abdominal surgery under subarachnoid block.[5-7] The aim of the present study was to find out the efficacy of levobupivacaine and ropivacaine in transversus abdominis plane block for providing postoperative analgesia after gynaecological surgery under spinal subarachnoid block.

Methods

After approval of the institutional ethics committees, this study was conducted from March 2021 to Mar 2022 at a tertiary care hospital in Odisha. Informed consent was taken from all patients. 60 patients with ASA status I and II of age 30- 70 years, scheduled for gynaecological surgeries under spinal subarachnoid block with bupivacaine, were included in the study. Patient with history of cardiovascular diseases, drug allergy and body mass index more than 30 were not included in this study.60 patients were divided randomly into two groups. All patients received inj. Ranitidine 50 mg IV and Inj. Metoclopramide 0.15 mg / kg. Blood pressure, heart rate, ECG and oxygen saturation were monitored. Subarachnoid block was given using a 25G Quincke type spinal

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

needle in the L3-L4 intervertebral space in midline with 3.5 ml of 0.5% bupivacaine heavy. After the surgery was over and dressing kept, all patients in the study group received ultrasound guided bilateral TAP blocks with 0.25% levobupivacaine or 0.375% ropivacaine (added with distilled water to make it 10 ml) on each side. (L and R group) Transversus abdominis plane block performed with help of ultrasound as explained by Borglum et al [8] as new four point approach using a 1.5-inch, 22-gauge needle. After careful aspiration 1 mL of local anaesthetic was injected to confirm placement of needle.0.25% levobupivacaine or 0.375% ropivacaine was administered in a dose of 1 mg/kg with close observation for any signs of toxicity. The same procedure was followed in the other side also. Rescue analgesic was given as inj. Tramadol 100 mg IV when there was VAS score more than 4. Rescue antiemetic was given as inj. Ondansetron 4 mg IV if there was complain of nausea or vomiting. The patients were assessed in the post-operative recovery room and later in the post operative ward at 6, 12, 24 and 48 hours after infra umbilical surgery. Pain, requirement of rescue analgesics, nausea and vomiting and sedation were monitored. All patient were asked to assess pain and post operative nausea and vomiting using the following scales and scores.

SCALES AND SCORES:[9]

1. Visual Analog Scale (VAS): 10 cm line in which 0=no pain and 10=worst pain
2. Categorical nausea scoring system: 0=none; 1=mild; 2=moderate; 3=severe.

The sample size was estimated based on mean 24 h morphine consumption (mg) from a previous study[10] where it was found that mean difference in morphine consumption in groups was 22 mg with standard deviation (SD) of 18.5. In another study comparing bupivacaine and ropivacaine, a sample size calculation was done so that a mean difference between groups in visual analogue scale (VAS) of 20 mm, with reduced pain scores in the bupivacaine group in comparison to the ropivacaine group, would permit a type 1 error rate of one-tailed $\alpha = 0.05$, and with the alternate hypothesis, the null hypothesis would be retained with a type II error of $\beta = 0.20$. The sizes came to 25 each, but we opted for 30 in each group to accommodate a bigger number and consider some dropouts. The statistical analysis was carried out using Statistical Package for Social Sciences (SPSS Inc., Chicago, IL, USA version 15.0 for Windows). All

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

quantitative variables were estimated using measures of central location (mean, median) and dispersion (SD). Normality of data was measured by Kolmogorov–Smirnov tests of normality. For normally distributed data, means were compared using Student's *t*-test. Qualitative or categorical variables were represented as frequencies and proportions. Proportions were compared using Chi-square or Fisher's exact test whichever was applicable. VRS scores, total rescue analgesic and rescue antiemetic used over 24 h and time-to-first analgesic and antiemetic used were compared using Mann–Whitney test. All statistical tests were two-sided and performed at a significance level of $\alpha = 0.05$

Results

The study was conducted in a total of 60 patients. There was no significant difference regarding demographic parameters in both groups.

Table 1: Requirement of analgesics and antiemetics

Parameter	**Group L**	**Group R**	**P Value**
Total tramadol requirement (mg)	170.00±22.2	290.00±21.1	0.001
Mean time to request first dose of tramadol (hrs)	10.9±3.22	3.45±0.45	0.001
Total antiemetic (Ondansetron) requirement (mg)	11.53±2.87	21.28±2.85	0.001

The total amount of rescue analgesic requirement was measured as total tramadol as rescue analgesic received. Mean values of total tramadol required were 170 mg for L group and 290 mg for R group (table 1) (fig 1). The difference was statistically significant (p value< 001) when analyzed using independent samples t test (table 1).

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

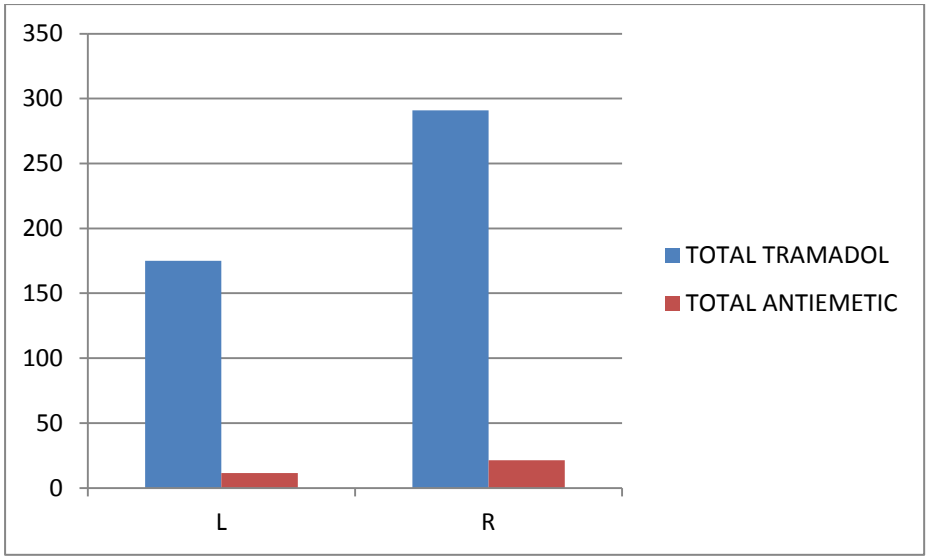

Figure 1: Requirement of analgesics and antiemetics

Average time taken for administration of the first dose of rescue analgesic was 10.9 hours in the L group and 3.45 hours in the R group (Table 1). This difference was also found to be statistically significant (P < 0.001) (Table 1). Average amount of antiemetic (ondansetron) was also found to be significantly decreased in the L group compared to R group. (Table 1; figure1)

Table 2: The VAS scores at different time intervals

Parameter	Group	No.	Mean	P value (2 tailed)
VAS 6 hr	L R	30 30	0.0 4.9	0.0001
VAS 12 hr	L R	30 30	2.4 4.8	0.0001
VAS 24 hr	L R	30 30	2.6 4.7	0.0001
VAS 48 hr	L R	30 30	1.8 2.2	0.009
Sedation Score 6 hr	L R	30 30	1.1 2.4	0.001

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

The VAS scores at different time interval was compared using independent t test. There was a significant decrease in the scores in the L group compared to R group.(tables2). Sedation scores at 6 hours were also compared in which significant difference was found between the two groups (table 2).

Discussion

Our trial concluded that levobupivacaine in transversus abdominis plane block after gynaecological surgery under subarachnoid block can reduce 48 hour rescue analgesic requirements and VAS scores compared to ropivacaine. Levobupivacaine also delayed the time to request for rescue analgesia and decreased postoperative nausea and vomiting compared to ropivacaine.A multimodal analgesic regimen will result in excellent analgesia, and helps to minimize the side effects of single drug administration. No optimum regimen is available, and different techniques continue to evolve. Intrathecal opioids along with single shot subarachnoid block, Patient controlled epidural or intravenous opioid analgesic regimens this has been found to provide effective analgesia. But these are usually associated with untoward effects like nausea, vomiting, pruritus, respiratory depression and reduce overall patient satisfaction. This study demonstrated that total postoperative rescue analgesic consumption was significantly reduced in the study group. The incidence of nausea and vomiting and hence the requirement of antiemetic was significantly reduced in the patients who received the block. This may be secondary to the tramadol sparing effect of the block. According to sharkey et al [11] transversus abdominis plane block significantly improved the quality of postoperative analgesia and reduced total opioid requirement and thereby reducing opioid related side effects in women undergoing caesarean delivery without intrathecal morphine. Bhattacharjee et all[11] concluded that preincisional transversus abdominis plane block decreased intraoperative fentanyl requirements and provide effective postoperative analgesia. Sharma et al [13] also found similar result after abdominal surgeries. Mankikar et al[14] done ultrasound guided transversus abdominis plane block using ropivacaine and found that there was reduced dose of analgesia requirement. Time for injection of first rescue analgesia in study group was prolonged from 4.1 hr to 9.53 hr which was similar to our study. Our findings are also in agreement with studies by Jiang et al[15] and Sadek et al[16].

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

Conclusion

Levobupivacaine in transversus abdominis plane block prolonged the post-operative analgesia after gynaecological surgeries under subarachnoid block. It not only reduced the postoperative VAS score but also reduced the dose of rescue analgesia requirement in post operative period.

References

1. Suresh S, Chan VW. Ultrasound guided transversus abdominis plane block in infants, children and adolescents: a simple procedural guidance for their performance. Paediatr Anaesth. 2009;19:296-9.

2. Rafi AN. Abdominal field block: a new approach via lumber triangle. Anaesthesia 2001;56:1024-6.

3. McDonnell JG, Curley G, Carney J, et al. The analgesic efficacy of transversus abdominis plane block after caesarean delivery: a randomized controlled trial. AnesthAnalg 2008:106:186-191.

4. Belavy D, Cowlishaw PJ, Howes M, Phillips F. Ultrasound-guided transversus abdominis plane block for analgesia after caesarean delivery. Br J Anaesth 2009;103:726-30.

5. Niraj G, Searly A, Mathews M, et al. Analgesic efficacy of ultrasound-guided transversus abdominis plane block in patients undergoing open appendicectomy. Br J Anaesth 2009; 103:601-5

6. El-Dawlatly AA, Turkistani A, Kettner SC, et al. ultrasound-guided transversus abdominis plane block: description of a new technique and comparison with conventional systemic analgesia during laparoscopic cholecystectomy. Br J Anaesth 2009; 102: 763-7.

7. Mishra L, Pani N, Mishra D, patel N. Bilateral transversus abdominis plane block as a sole anaesthetic techque in emergency surgery for perforative peritonitis in high risk patients. J Anaesthesiol Clin Pharmacol. 2013;29:540-2

8. J. Borglum, C. Maschmann, B. Belhage, K. Jensen. Ultrasound –guided bilateral dual transversus abdominis plane block: a new four-point approach. ActaAnaesthesiolScand2011;55(6): 658-663.

ISSN: 0975-3583, 0976-2833 VOL 14, ISSUE 09, 2023

9. Srivastava U, Verma S, Singh TK, Gupta A, Saxsena A, Jagar KD. Efficacy of trasabdominis plane block for post caesarean delivery analgesia: A double blind randomized trial. Saudi J Anaesth 2015;9:298-302

10. Sinha S, Palta S, Saroa R, Prasad A. Comparison of ultrasound-guided transversus abdominis plane block with bupivacaine and ropivacaine as adjuncts for postoperative analgesia in laparoscopic cholecystectomies. Indian J Anaesth. 2016 Apr;60(4):264-9.

11. Sharkey A, Finnerty O, Mc Donnell JG. Role of transversus abdominis plane block after caesarean delivery. Curr opin Anaesthesiol 2013;26(3):268-72

12. Bhattacharjee S, Ray M, Ghose T, Maitra S, Layek A. Analgesic efficacy of transverus abdominis plane block in providing effective perioperative analgesia in patients undergoing total abdominal hysterectomy: a randomized controlled trial; J Anaesthesiol clin Pharmacol. 2014;30:391-396

13. Sharma P, Chand T, Saxena A, Mittal A, Srivastava U. Evaluation of postoperative analgesic efficacy of transversus abdominis plane block after abdominal surgery: A comparative study. J Nat Sci Biol Med. 2013;4(1):177-180

14. Mankikar M G, Sardesai S P, Godki P S, Ultrasound – guided transversus abdominis plane block for post operative analgesia in patients undergoing caesarean section. Indian J of anaesthesia. 2016 April; 60(4): 253-257.

15. Ma J, Jiang Y, Tang S, Wang B, Lian Q, Xie Z, et al. Analgesic efficacy of ultrasound-guided subcostal transversus abdominis plane block. Medicine (Baltimore). 2017;96:e6309

16. Al-Sadek WM, Rizk SN, Selim MA. Ultrasound guided transversus abdominis plane block in pediatric participants undergoing laparoscopic surgery. Egypt J Anaesth. 2014;30:273-8