



# International Journal of Medical Anesthesiology

E-ISSN: 2664-3774  
P-ISSN: 2664-3766  
[www.anesthesiologypaper.com](http://www.anesthesiologypaper.com)  
IJMA 2019; 2(2): 247-249  
Received: 20-05-2019  
Accepted: 24-06-2019

**Dr. Anupama Sahasrabudhe**  
Associate Professor,  
Department of  
Anaesthesiology, D. Y. Patil  
Medical College, Kolhapur,  
Maharashtra, India

**Dr. Arati Bhaskar Jadhav**  
Assistant Professor,  
Department of  
Anaesthesiology, D. Y. Patil  
Medical College, Kolhapur,  
Maharashtra, India

**Dr. Harish Metange**  
Senior Resident, Department  
of Anaesthesiology, D. Y. Patil  
Medical College, Kolhapur,  
Maharashtra, India

**Corresponding Author:**  
**Dr. Arati Bhaskar Jadhav**  
Assistant Professor,  
Department of  
Anaesthesiology, D. Y. Patil  
Medical College, Kolhapur,  
Maharashtra, India

## Comparison of low volume versus high volume TAP block for post-operative analgesia in lower segment Cesarean section

**Dr. Anupama Sahasrabudhe, Dr. Arati Bhaskar Jadhav and Dr. Harish Metange**

**DOI:** <https://doi.org/10.33545/26643766.2019.v2.i2d.58>

### Abstract

**Introduction:** During pregnancy, enhanced sensitivity to local anaesthetics (LAs) as a result of altered physiology may increase the risk of LA systemic toxicity (LAST).

**Aims and Objectives:** To study low volume versus high volume TAP block for post-operative analgesia in lower segment caesarean section.

**Methodology:** This was a cross sectional study carried out in the patients undergoing LSCS during the one year period i.e. January 2018 to January 2019 in the one year period by taking written and explained consent 60 were enrolled to study. Out of the 60, 30 were given low volume (Group A) high volume (Group B) TAP block for analgesia all details of the patients like age, sex, pain after operation was measured by Visual analogue scale score (VAS score) and analgesic requirement was measured by average no of tablets required for the patients. The statistical analysis was analysed by chi-square test and unpaired t-test calculated SPSS 19 version software.

**Result:** The age was comparable in both the groups i.e.  $29.12 \pm 2.72$  Yrs and  $28.62 \pm 1.95$  ( $p > 0.05, df=59, t=0.98$ ) VAS score on 6hr  $6.67 \pm 1.62$  and  $6.39 \pm 1.72$  was comparable ( $p > 0.05, df=59, t=0.82$ ) VAS score on 24 hr was  $4.83 \pm 2.31$  and  $5.12 \pm 1.84$  was comparable ( $p > 0.05, df=59, t=0.71$ ); Analgesic consumption on 6hr (Tablets) was  $0.98 \pm 0.29$  and  $0.89 \pm 0.42$  was comparable ( $p > 0.05, df=59, t=0.53$ ); Analgesic consumption on 24 hr (Tablets) was  $0.76 \pm 0.19$  and  $0.69 \pm 0.28$  Comparable ( $p > 0.05, df=59, t=0.28$ ).

**Conclusion:** It can be concluded from our study that the efficacy of low dose and high dose TAP block was comparable to each other with respect to Pain (VAS score) and requirement of post operatively analgesics hence low volume should be preferred over high volume to reduce the LA induced complications.

**Keywords:** TAP block, lower segment Cesarean section (LSCS)

### Introduction

During pregnancy, enhanced sensitivity to local anaesthetics (LAs) as a result of altered physiology may increase the risk of LA systemic toxicity (LAST) [1-3]. Even when the recommended maximal allowable LA doses are adhered to, the minimum toxic plasma concentrations can still be exceeded [1]. There have been several published cases of tonic clonic convulsions in women receiving TAP block for caesarean delivery. The surgery and tissue dissection is limited to few dermatomes, so blocking those should provide adequate analgesia. However, utilizing lower doses may compromise the analgesic efficacy of the block. The optimum dosing strategy of balancing analgesic efficacy and toxic plasma levels should be accepted. Whilst studies have explored TAP blocks in the non-obstetric population and suggested similar efficacy between lower doses and higher doses of LA, few studies have directly compared post-caesarean delivery analgesic outcomes after low-dose (LD) and high-dose (HD) LA for TAP blocks [4, 5]. Singh and colleagues [4] concluded that in the presence of ITM, neither HD nor LD LA TAP decreased pain scores at 24 h, whilst another study demonstrated that LD LA TAP provided similar analgesia effects compared with a higher-dose LA [5].

So, we have done study to study the effectiveness of Low dose versus high dose TAP block for post-operative analgesia in lower segment caesarean section at tertiary health care centre.

### Methodology

This was a cross sectional study carried out in the patients undergoing LSCS during the one

year period i.e. January 2018 to January 2019 in the one year period by taking written and explained consent 60 were enrolled to study. Out of the 60, 30 were given low volume (0.25% bupivacaine 10 ml, on both sides -Group A) high volume (0.25% bupivacaine 20 ml, on both sides - Group B) TAP block for analgesia all details of the patients like age weight, pain after operation was measured by Visual analogue scale score (VAS score) and analgesic requirement was measured by average no of tablets required for the patients. The statistical analysis was analysed by chi-square

test and unpaired t-test calculated SPSS 19 version software.

## Result

**Table 1:** Distribution of the patients as per the age

	Group A (n=30)	Group B (n=30)	p-value
Age (Yrs.)	29.12 ± 2.72	28.62 ± 1.95	$p > 0.05, df=59, t=0.98$

The age was comparable in both the groups i.e. 29.12 ± 2.72 Yrs and 28.62 ± 1.95 ( $p > 0.05, df=59, t=0.98$ )

**Table 2:** Distribution of the patients as per the operative parameters

	Group A (n=30)	Group B (n=30)	p-value
VAS score on 6hr	6.67 ± 1.62	6.39 ± 1.72	$p > 0.05, df=59, t=0.82$
VAS score on 24 hr	4.83 ± 2.31	5.12 ± 1.84	$p > 0.05, df=59, t=0.71$
Analgesic consumption on 6hr (Tablets)	0.98 ± 0.29	0.89 ± 0.42	$p > 0.05, df=59, t=0.53$
Analgesic consumption on 24 hr (Tablets)	0.76 ± 0.19	0.69 ± 0.28	$p > 0.05, df=59, t=0.28$

VAS score on 6hr 6.67 ± 1.62 and 6.39 ± 1.72 was comparable ( $p > 0.05, df=59, t=0.82$ )

VAS score on 24 hr was 4.83 ± 2.31 and 5.12 ± 1.84 was comparable ( $p > 0.05, df=59, t=0.71$ );

Analgesic consumption on 6hr (Tablets) was 0.98 ± 0.29 and 0.89 ± 0.42 was comparable ( $p > 0.05, df=59, t=0.53$ ); Analgesic consumption on 24 hr (Tablets) was 0.76 ± 0.19 and 0.69 ± 0.28 Comparable ( $p > 0.05, df=59, t=0.28$ )

## Discussion

TAP block requires administration of a bolus of local anaesthetic into the transversus abdominis plane, a space between the internal oblique and transversus abdominis muscles [6]. The landmark technique was first described in 2001 by Rafi [7, 8] as the one-pop technique and was modified by McDonnell who described a 'two pop' method using a blind insertion of a regional anaesthesia needle perpendicular to the skin, just superior to the iliac crest and behind the mid-axillary line [7, 9] McDonnell *et al.* have also shown that landmark-based TAP block can be used successfully to provide postoperative pain relief after Caesarean delivery.<sup>9</sup> The reported success rate with the landmark technique was found to be around 85% amongst experienced practitioners. TAP block has been considered to have a low incidence of complications. Only a few complications have been reported secondary to the TAP block: intrahepatic injection in a patient with hepatomegaly, [11] intraperitoneal TAP catheter misplacement without abdominal organ damage and an anaphylactic reaction after ropivacaine injection [12, 13]. Short-term femoral nerve palsy is a potential complication because of the proximity of the TAP and the femoral nerve [6] Even though reported systemic toxicity was not found in the literature as a complication of TAP block, it remains a possibility. As in cesarean delivery only lower abdominal nerves are sufficient to produce adequate analgesia as dissection is limited. In our study, no complications were found that could be attributed to the TAP block, but they should be kept in mind while performing the block. The clinical efficacy of the TAP block has been demonstrated in different randomized controlled clinical trials of adults undergoing both lower and upper abdominal surgeries [9, 10-14]. Most reports showed the effectiveness of TAP blocks by looking at reduced postoperative opioid requirement, lower pain scores and reduction in opioid-related side effects. Jankovic reviewed the development of TAP block within 10 years, considering both landmark technique and ultrasound-guided technique. He summarized that several of the randomized controlled single shot TAP block studies showed this to be effective up to 48 h and to decrease postoperative morphine consumption by 70–85%.<sup>6</sup> Other

studies confirmed the effectiveness after Caesarean section with lower pain scores, less opioid requirement and thereby fewer side effects [13, 15-17].

In our study we have seen The age was comparable in both the groups i.e. 29.12 ± 2.72 Yrs and 28.62 ± 1.95 ( $p > 0.05, df=59, t=0.98$ ), VAS score on 6hr 6.67 ± 1.62 and 6.39 ± 1.72 was comparable ( $p > 0.05, df=59, t=0.82$ ) VAS score on 24 hr was 4.83 ± 2.31 and 5.12 ± 1.84 was comparable ( $p > 0.05, df=59, t=0.71$ ); Analgesic consumption on 6hr (Tablets) was 0.98 ± 0.29 and 0.89 ± 0.42 was comparable ( $p > 0.05, df=59, t=0.53$ ); Analgesic consumption on 24 hr (Tablets) was 0.76 ± 0.19 and 0.69 ± 0.28 Comparable ( $p > 0.05, df=59, t=0.28$ )

These findings are similar to S. C. Ng [18] *et al.* they found Low-dose TAP blocks for Caesarean delivery provide analgesia and opioid-sparing effects comparable with the high-dose blocks. As pain of LSCS is restricted to few dermatomes, (below T10) low volume should be sufficient to provide good analgesia This suggests that lower doses can be used to reduce local anaesthetic toxicity risk without compromising the analgesic efficacy.

## Conclusion

It can be concluded from our study that the efficacy of low dose and high dose TAP block was comparable to each other with respect to Pain (VAS score) and requirement of post operatively analgesics hence low volume should be preferred over high volume to reduce the LA induced complications.

## References

1. Griffiths JD, Le NV, Grant S, Bjorksten A, Hebbard P, Royse C. Symptomatic local anaesthetic toxicity and plasma ropivacaine concentrations after transversus abdominis plane block for Caesarean section. *Br J Anaesth.* 2013; 110:996e1000
2. Weiss E, Jolly C, Dumoulin JL *et al.* Convulsions in 2 patients after bilateral ultrasound-guided transversus abdominis plane blocks for Caesarean analgesia. *Reg Anesth Pain Med.* 2014; 39:248e51
3. Ahin AS, Ay N, Ahbaz NA, Akay MK, Demiraran Y, Derbent A. Analgesic effects of ultrasound-guided

- transverse abdominis plane block using different volumes and concentrations of local analgesics after laparoscopic cholecystectomy. *J Int. Med Res.* 2017; 45:211e9
4. Singh S, Dhir S, Marmai K, Rehou S, Silva M, Bradbury C. Efficacy of ultrasound-guided transversus abdominis plane blocks for post-Caesarean delivery analgesia: A double-blind, dose-comparison, placebo-controlled randomized trial. *Int. J Obstet Anesth.* 2013; 22:188e93.
  5. Mohamed AZA. Assessment of the analgesic potency of ropivacaine 0.2% versus ropivacaine 0.5% in transversus abdominis plane block after Caesarean delivery. *Egypt J Anaesth.* 2016; 32:385e90.
  6. Jankovic Z. Transversus abdominis plane block: the holy grail of anaesthesia for (lower) abdominal surgery. *Period Biol.* 2009; 111(2):203-8.
  7. Ismail S. What is new in postoperative analgesia after caesarean sections? *Anaesthesia, Pain Intensive Care.* 2012; 16(2):123-6.
  8. Rafi AN. Abdominal field block via the lumbar triangle revisited. *Anaesthesia.* 2012; 67(12):1399-401. <https://doi.org/10.1111/anae.12077>
  9. McDonnell JG, O'Donnell B, Curley G *et al.* The analgesic efficacy of transversus abdominis plane block after abdominal surgery: A prospective randomized controlled trial. *Anesth Analg.* 2007; 104(1):193-7. <https://doi.org/10.1213/01.ane.0000250223.49963.0f>
  10. Petersen PL, Stjernholm P, Kristiansen VB *et al.* The beneficial effect of transversus abdominis plane block after laparoscopic cholecystectomy in day-case surgery: a randomized clinical trial. *Anesth Analg.* 2012; 115(3):527-33.
  11. Farooq MCM. A Case of Liver Trauma with a Blunt Regional Anesthesia Needle While Performing Transversus Abdominis Plane Block. *Reg Anesth Pain Med [Internet].* 2008; 33(3):274-5. Available from:<https://www.ncbi.nlm.nih.gov/pubmed/18433683>
  12. Jankovic Z, Ahmad N, Ravishankar NAF. Transversus Abdominis Plane Block: How Safe is it?. *Anesth Analg [Internet].* 2008; 107(5):1758-9. Available from: <https://insights.ovid.com/pubmed?pmid=18931248>
  13. Belavy D, Cowlshaw PJ, Howes M *et al.* Ultrasound-guided transversus abdominis plane block for analgesia after Caesarean delivery. *Br J Anaesth.* 2009; 103(5):726-30. <https://doi.org/10.1093/bja/aep235>
  14. Hussein M, Youssef K, Hassan M. Comparative Study between Continuous transversus abdominis plane block and ON-Q anesthetic pump for postoperative analgesia following caesarean section. *Life Sci J.* 2012; 9(1s):179-83.
  15. Baaj JM, Alsatli RA, Majaj HA *et al.* Efficacy of ultrasound-guided transversus abdominis plane (TAP) block for post-cesarean section delivery analgesia: A double-blind, placebo-controlled. Randomized Study. *Middle East J Anesthesiol.* 2010; 20(6):821-6.
  16. McDonnell JG, Curley G, Carney J *et al.* The analgesic efficacy of transversus abdominis plane block after cesarean delivery: a randomized controlled trial. *Anesth Analg.* 2008; 106(1):186-91. <https://doi.org/10.1213/01.ane.0000290294.64090.f3>
  17. Kanazi GE, Aouad MT, Abdallah FW *et al.* The analgesic efficacy of subarachnoid morphine in comparison with ultrasound-guided transversus abdominis plane block after cesarean delivery: a randomized controlled trial. *Anesth Analg.* 2010; 111(2):475-81.
  18. Ng SC, Habib AS, Sodha S *et al.* High-dose versus low-dose local anaesthetic for transversus abdominis plane block post-Caesarean delivery analgesia: A meta-analysis. *British Journal of Anaesthesia.* 2018; 120(2):252-263