

To Compare the Efficacy of Ropivacaine Versus Bupivacaine during Surgical Transversus Abdominis Plane Block for Post-Operative Analgesia after Caesarean Section

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Abstract

Background & Aim: • To compare the efficacy of Ropivacaine Versus Bupivacaine for post-operative analgesia during surgical TAP block during caesarean section.

• To correlate the advantages and side effects of the drugs during the surgical TAP block. **Methods and Materials:** A randomized control study (double blind) including 100 women who required caesarean section and fulfilled the inclusion criteria. Institutional ethics committee approval was obtained for this prospective study. Patients were randomized as Group A: received surgical TAP block with Bupivacaine. Group B: received TAP block with Ropivacaine. Surgical TAP block was administered to the patients via the trans-peritoneal route with dose of the drug adjusted with weight of patient and visual analogue score (VAS) was assessed by an observer blind to the group allocation. Time required for rescue analgesia was and the 'Mann-Whitney U test' was used for statistical analysis. **Results:** The duration of post-operative analgesia in hours was comparable in both groups [Group A: Bupivacaine 5.24 ± 1.53 hrs, Group B Ropivacaine 4.96 ± 1.58 hrs]. There were no reported complications during the surgical technique or any adverse effects to bupivacaine and ropivacaine administered for the

TAP block. **Conclusion:** Surgical TAP block with Bupivacaine and Ropivacaine is equally effective with no significant difference in the duration of post-operative analgesia. Surgical TAP block is a safe, effective and easy technique to provide post-operative analgesia and should establish as a routine during caesarean section delivery.

Keywords: Transversus Abdominis Plane Block; Bupivacaine; Ropivacaine; Surgical TAP block.

Introduction

The surgical transversus abdominis plane (TAP) block has proved an effective means of providing postoperative analgesia in women undergoing caesarean section [1,2].

The TAP block can be performed effectively using the blind technique, ultrasound guided technique and the surgical TAP block by the operating surgeon. The surgical TAP block technique has the advantage of asepsis being more easily attained, visible and tactile confirmation of correct placement of the needle and no added risks.

There have been studies done with comparison of bupivacaine

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and ropivacaine with the blind and USG guided TAP block [3,4]. We encompass to undertake this study by comparing the efficacy of above two drugs during the surgical TAP block while performing caesarean section.

Providing post-operative analgesia by TAP block with these long acting drugs will ease the post-operative discomfort of the patient and promote early breast feeding and mother baby bonding. The overall need of parenteral analgesics is also reduced [4].

Material and Methods

A randomized controlled double blind study including 100 women who required caesarean section was sanctioned by the institutional ethics committee. Written informed consent was obtained from all patients. Simple randomization was performed by picking of envelopes. High risk caesarean deliveries with ASA III, known allergy to any drug, requiring general anesthesia, vertical incision and those with thrombocytopenia were excluded from the study. Patients with height less than 150 cms and height more than 180 cms were also excluded from the study as the dose required for spinal anesthesia is different. All included patients received spinal anesthesia with 2 cc of 0.5% Bupivacaine heavy. The included patients were randomized in two groups. Group A received Bupivacaine 0.25% in dose of 0.25 ml/kg. Group B received Ropivacaine 0.35% in dose of

0.25 ml/kg. Surgical TAP block was administered for all the patients via the trans-peritoneal route. Post-operative analgesia was monitored by a blinded observer using the visual analogue score [VAS]. Rescue analgesia injection diclofenac 75 mg intra-muscular was administered when the patient complained of pain [VAS-3]. The two independent sample 't-test' was used for statistical analysis. Side effects of the drugs if any were also noted and documented.

Results

Hundred patients were recruited in the study, 50 received bupivacaine and 50 received ropivacaine.

Both the groups were comparable with the patient characteristics of height, weight and BMI [Table 1].

The duration of post-operative analgesia in hours was comparable in both the groups [Table 2]. Bupivacaine duration of analgesia was 5.24 ± 1.53 hours. Ropivacaine group had a mean duration of analgesia of 4.96 ± 1.58 . The 'Mann-Whitney U test' was used for statistical analysis and there was no significant difference in the mean duration of post-operative analgesia between both the groups [p value of 0.361].

There was no observed complication of the surgical TAP block technique. There was no observed side effect of the drugs bupivacaine and ropivacaine.

Table 1: Profile of both groups

Characteristic	Mean \pm SD		p value [not significant]
	Group I Bupivacaine [n=50]	Group II Ropivacaine [n=50]	
Height [cms]	156.42 \pm 4.01	160.80 \pm 6.01	
Weight [Kg]	69.30 \pm 11.56	73.18 \pm 8.94	
BMI	28.33 \pm 4.70	28.25 \pm 2058	0.920

Table 2: Duration of analgesia.

	Mean \pm SD		p value [Not Significant]
	Group I Bupivacaine [n=50]	Group II Ropivacaine [n=50]	
Duration of Post-operative analgesia (Hours)	5.24 \pm 1.53	4.96 \pm 1.58	0.361

Discussion

Surgical TAP block has been effective for providing post-operative analgesia after caesarean section delivery [2]. It is a new, rapidly expanding

regional anesthesia technique that provides analgesia following abdominal surgery. It involves a single large bolus injection of local anesthetic into the TAP, an anatomical space between the internal oblique and transversus abdominis muscles. TAP

block significantly reduces pain associated with lower abdominal surgery, regardless of whether it is used as the primary anesthetic or for pain control after general or spinal anesthesia [5].

An ideal local anesthetic should produce effective, controlled, sensory block of rapid onset and longer duration. It should have a high therapeutic index. Bupivacaine has most of these characteristics but has a risk of refractory cardiotoxicity if accidentally injected in the systemic circulation [6]. These concerns led to introduction of newer agents like ropivacaine and levobupivacaine. Ropivacaine has been known to be more effective than bupivacaine irrespective of the routes administered. The equipotency ratio of 1.3:1 to 1.5:1 between ropivacaine and bupivacaine leads to difference in the concentration of the drugs used [6].

The present study showed equal efficacy between the two drugs for providing post-operative analgesia with a mean duration of 5 Hours. The duration of analgesia with bupivacaine can be prolonged by addition of drugs like dexamethasone, clonidine and tramadol.

There was no side effect detected for the drugs bupivacaine and ropivacaine.

Conclusion

Bupivacaine and Ropivacaine are both equally effective for providing post operative analgesia with surgical TAP block after caesarean section. These drugs are safe and surgical TAP block should be routinely administered for post-operative analgesia after caesarean section.

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