Original Article

A combination of Tramal with Bupivacine versus Bupivacaine alone in wound infiltration and ilioinguinal blocks in herniotomy

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ABSTRACT

Objective: To evaluate the analgesic efficacy and tolerability of tramadol with bupivacaine, in comparison with bupivacaine alone.

Methodology: This was a double-blind randomized study on 300 Paediatric patients undergoing inguinal hernia repair under general aneasethsia with local infiltration anesthesia and ilioinguinal blockade at Queen Rania Paediatric Hospital, Jordan. Post operative pain at 1,2,3,6, 12 and 24 hours and analgesic requirements (paracetamol and Ibuprofen) were assessed.

Results: Two hundred ninety patients were admitted for twenty four hours for evaluation, four patients were discharged because parents refuse admission. The median intra-operative VAS score was 10 (IR 15) in group I, receiving the combination of 2 drugs vs. 12 (IR 16) in group II, receiving bupivacaine alone, (P = 0.02). There was no difference in pain scores or analgesic requirements at 12 hour post-operatively). Distribution of intra-operative VAS scores showed a greater number (P<0.05) of patients having a VAS score > 30 post-operatively in patients receiving the combination of both drugs vs. bupivacaine alone.

Conclusion: The use of combination of Tramal and Bupivacaine infiltration with ilioinguinal blocks is more effective than the bupivacaine group alone and can produce rapid onset of block and also stays for longer duration. We recommend this technique for groin hernia repair to reduce post-operative pain.

KEY WORDS: Anesthetic techniques, Regional anaesthetic techniques, Subcutaneous, Tramal, bupivacine.

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INTRODUCTION

Elective inguinal groin hernia repair may be performed under general anesthesia, regional anesthesia, (spinal or epidural), or local infiltration anaesthesia. Current evidence supports the use of local infiltration anaesthesia as it has a shorter intra-hospital recovery, less urinary morbidity and overall costs.[1,2] However, despite these advantages local infiltration anaesthesia alone is rarely used[3-5], in pediatric age group because they are uncooperative.[6-10] One of the explanations to the infrequent use of local infiltration anaesthesia may be intra-operative patients discomfort and pain.[9]

Although step-wise, local infiltration anaesthesia has been recommended without additional ilioinguinal blockade[8], most studies have utilized this technique together with sedation moderate to high doses of benzodiazepines, requiring attendance of an anaesthetist. The argument for this combined technique has been improved patient satisfaction compared with unmonitored local infiltration anaesthesia with only small doses of sedation.

In order to improve intra-operative analgesia a combined ilioinguinal blockade plus step-wise local infiltration anaesthesia may be rational, but there are no data from randomized studies to support this approach in children. Therefore, the purpose of the present study was in a double-blind, randomized setup to investigate intra-operative analgesia in inguinal hernia repair under monitored step-wise infiltration anaesthesia. The use of combination of Tramal and Bupivacaine infiltration with ilioinguinal blocks is more effective than the bupivacaine group alone and can produce rapid onset of block and also stays for longer duration.

Tramadol, a synthetic 4-phenyl-piperidine analogue of codeine, has been available in the UK since 1994; although it is licensed only for use in children aged 12 years. Tramadol is a racemic mixture of two enantiomers, (+)- tramadol and (-) tramdol,. The (+) – enantiomer has a moderate affinity for the opioid receptor, greater than that of the (-)-enantiomer. In addition, the (+) - enantiomer inhibits serotonin uptake and the (-) - enantiomer is a potent noradrenaline inhibitor, complementary properties which result in a synergistic antinciceptive interaction between the two enantiomers. The result is an opioid with a striking lack of respiratory depressant effect despite an analgesic potency approximately equal to that of pethidine.

METHODOLOGY

Three Hundred patients undergoing elective, inguinal hernia repair under general aneasthesia with monitored step-wise local infiltration anaesthesia were randomized to an additional iloinguinal blockade. This study was done at Queen Rania Pediatric hospital over a period of 6 months, on 300 patients age between 1 to 8 years, this double randomized blind study was divided in two groups, group I: TB (tramal with bupivacaine). = 150 patients and group II B (bupivacaine) = 150 patients. The doze of TB group was 2 mg/kg of tramadol combined with 2 mg/kg. Bupivacaine, 0.5% in a total volume of 1 ml/kg and for group B (bupivacaine is 2 mg/kg also in total volume of 1 ml/kg, of 0.5% concentration. The total body weight ranging between 10-30 kg. Local infiltration anesthesia for inguinal hernia repair is cost-effective, but fear of pos-operative pain decreases its widespread use.

All operations were performed at the same hospital in two different theaters and two different surgeons. Inclusion criteria were a primary inguinal hernia repair and age between one to eight years. Patients with bilateral hernias, upper respiratory tract infections, an irreducible or recurrent hernia, and body weight more than 30 kg were excluded.

Pre-medication for out patients was done by giving 3 mg/kg ketamine 1% one hour before surgery orally mixed with apple juice. At the end of surgery an ilioinguinal block with infiltration 1 ml/kg for group I and also one 1 ml/kg for group II of bupivacaine 0.5% by injection 3-4 cm medially of the ancestor superior iliac spine, infiltration anaesthesia was provided for both groups injected intra- and subcutaneously and subfacially and in the deeper layers at the end of the operation.[8]

Immediately post-operatively we assessed the pain experience on a visual analogue pain scale (VAS) at 1,2,3,6, -12, and 24 hours, consumption of analgesics (ibuprofen, 1mg/kg and paracetamol 15 mg/kg) was recorded.

Patients parents gave written informed consent. Data are presented as mean (SD) for continuous numerical data and as median values (IR, interquartile range) for ordinal data. $P < 0.05$ was considered significant.

RESULTS

Of the 300 patients, two patients were excluded because of an electrical power cut after completion of local infiltration and in four patients assessment schemes were lost. Two hundred ninety patients were admitted for twenty four hours who completed the study, four patients were discharged because parents refused admission. Patients characteristics, sedation, and anaesthesia data are shown in Table-I. It shows patient characteristics, anaesthesia and sedation data, and analgesic use 0-12 post-operatively in patients undergoing inguinal herniorrhaphy with ilioinguinal block ($P>0.05$ between groups). Data are mean (range) or mean (SD). There was no differences in age, use of sedation and amount of TB or B for infiltration anaesthesia between the two groups. Post-operative use of midazolam for seda-

Table-I: Patients characteristics, anaesthesia and sedation data

	Group I (TB group) nr= 146	*Group 2 (B) nr = 144*	*P - value*
Age	1-8 y	1-8 y	0.59
Tramal with bupivacaine infiltration anaesthesia (mg)			
Intra-operatively (Tramal)	20-75	20-75	0.68
Total bupivaciane alone	20-50	20-50	0.59
Ketamine (0-1 h) – mg/kg orally	146	144	0.66
Ibuprofen (mg) supp. 1-12 h	10	40	0.48
Ibuprofen (mg) supp. 12-24 h	60	90	0.38
Paracetamol mg supp (1-12)	20	60	0.48

tion was low (1.0-2.0 mg) and restricted for only eight patients in second group.

The median intra-operative VAS score was 10 (IR 15) in group I, receiving the combination of 2 drugs vs. 12 (IR 16) in group II, receiving bupivacaine alone, (P = 0.02). There was no difference in pain scores or analgesic requirements at 12 hours post-operatively. Distribution of intra-operative VAS scores showed a greater number (P<0.05) of patients having a VAS score > 30 post-operatively in patients receiving the combination of both drugs vs. bupivacaine alone.

DISCUSSION

The results of this randomized study shows intra-operative ilioinguinal blockade together with local infiltration anaesthesia procedure[8] in group I, improves post-operative analgesia in inguinal hernia repair. These results may have important clinical implications as it is well established that local infiltration anaesthesia, may be the most cost-effective anaesthetic technique for inguinal hernia repair.[1,2]

Despite the firm evidence to support the use of local anaesthesia[1] data from clinical practice[3-5] shows that this technique is not widely used, probably because of the risk of post-operative infection and sometime bleeding, surgical preferences, and the use of monitored anaesthesia care with additional doses of propofol and short acting opioids.[9,11-14]

Although local infiltration anaesthesia with blocks may provide significant cost reduction, obviously further safety studies are required to support previous large series from single centers[9] and the present study.

The results of this study are not surprising as several previous authors have shown that an ilioinguinal blockade may provide better postoperative pain relief following inguinal hernia repair in adults[12-14] and children[15,16] compared with B group. However, in these studies intra-operative pain could not be assessed as the patients were treated with monitored anaesthesia care with use of higher doses of pre-medication and/or intra-operative propofol and opioid.[12-14]

The improved intra-operative pain relief associated with an additional ilioingiunal blockade had no effect on later (12 and 24 hours) pain scores or analgesic use. These findings are consistent with a systematic review of randomized studies on pre-emptive analgesia, demonstrating that early pre/intra-operative intervention may not have long lasting analgesic effects into the postoperative period compared with post-incisional administration.[17]

In conclusion, the use of intra-operative ilioinguinal field block is the well established local infiltration anaesthesia procedure[8] for inguinal hernia repair using the combination of both drugs (TB group) as it improves post-operative pain relief and is therefore recommended. This technique may support a more wide spread use of local anaesthesia for inguinal hernia repair, intra-operatively under general anaesthesia using this combination.

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Authors Contribution:

Hussein I. Al-Khraysha did statistical analysis & editing of manuscript, data collection and manuscript writing while Ahmad Al-Raymoony did review and final approval of manuscript.