

*Research Article*

## Addition of Dexmedetomidine To Bupivacaine In Transversus Abdominis Plane Block In Pediatrics

Amany Khairy, Haidy Salah, Ahmed Wafdi

Department of Anaesthesia and Intensive Care Unit, Faculty of Medicine, Minia University

### Abstract

**Introduction:** Abdominal field blocks have been used in anesthesia for surgery involving the anterior abdominal wall for several decades, Dexmedetomidine is a selective alpha-2 adrenergic agonist with both analgesic and sedative properties. When administered as a perineural adjuvant Dexmedetomidine reduces initial blocking time whilst prolonging sensory and motor blockade duration. **Methods:** Patients were randomly classified into two groups using computer generated table numbers, each contain (30) patient. Group C received ultrasound guided transverses abdominis plane block with 0.3D<sub>1</sub>, receive ultrasound guided transverses abdominis plane block with 0.3ml/kg of 0.25% bupivacaine plus 1µg/kg dexmedetomidine diluted in 5ml 0.9% normal saline. **Results:** We found that the addition of dexmedetomidine in a dose of 1µg/kg to bupivacaine in TAP block resulted in delayed onset of first analgesic request, prolonged postoperative analgesia, more patient and parent satisfaction when compared to bupivacaine alone.

**Keywords:** Dexmedetomidine, Bupivacaine, TAP, pediatrics, postoperative analgesia.

### Introduction

A substantial component of the pain experienced by patients after abdominal surgery is derived from the abdominal wall incision. The abdominal wall is innervated by nerve afferents that course through the transversus abdominis neurofascial plane (McDonnell et al., 2007).

Abdominal field blocks have been used in anesthesia for surgery involving the anterior abdominal wall for several decades. Many blocks in this area are either difficult or high risk when performed blind, but ultrasound renders them very accessible and safe to perform (Hebbard et al., 2007).

### Patients and Methods

After obtaining approval by the Hospital Ethics Committee of El-Minia University Hospital and all parents of the patients were informed about the procedure and its possible consequences and written informed consent was obtained sixty children from 1 to 7 years of both gender, ASA I scheduled to undergo open unilateral

infraumbilical incision under general anesthesia with ultrasound guided TAP block were enrolled in this prospective randomized double-blind study.

### Sample size and statistical methods:

The sample size for this study was calculated based on a pilot study established on 10 individuals, at least 27 patients per group were needed and taking into account dropouts, we set the target sample size at 30 per group.

### Methods of statistical analysis:

Data were collected, revised, verified, coded, then entered PC for statistical analysis done by using SPSS statistical package version 20.

### Results

Regarding Post-operative analgesia in the studied groups

Time the first analgesic requirement was significant among the studied groups. It was longer in group D, with a mean value of (19.0±3.0 hour). Group C showed the least of all with a mean value (4.9±0.7 hour).

**Table: Postoperative analgesic requirements in the studied groups**

	Group C N=30	Group D <sub>0.5</sub> N=30	Group D <sub>1</sub> N=30	P-Value			
	Mean±SD	Mean±SD	Mean±SD	P	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>
<b>First analgesic requirement (hour)</b>	4.9±0.7	14.5±2.3	19.0±3.0	<0.001*	<0.001*	<0.001*	<0.001
<b>Total paracetamol mg/kg</b>	497.5±168.2	190.08±34.7	124.1±22.6	<0.001*	<0.001*	<0.001*	<0.001
<b>Number of paracetamol doses (frequency)</b>	3±0	1.9±0.4	1±0.5	<0.001*	<0.001*	<0.001*	<0.001*

The total paracetamol (mg/kg) in the studied groups was significant. Group D<sub>1</sub> showed lower paracetamol consumption in comparison with group C with a mean value of (124.1±22.6 mg/kg), (497.5±168.2mg/kg) respectively, with total number of postoperative analgesia first 24 was (1±0.5), and (3±0) in group D<sub>1</sub> and group C.

### Discussion

Our primary outcome was to study the effect of two doses of dexmedetomidine added to bupivacaine in TAP block in pediatrics undergone unilateral infraumbilical surgery on postoperative analgesia, analgesic consumption, post-operative pain score and postoperative side effects compared with bupivacaine alone.

As regard to postoperative analgesia, the time to first analgesic requirement was significant among the studied groups with p value (<0.001). It was longer in group D<sub>1</sub> with a mean value of (19.0±3.0 hour). Group C showed the least of all with a mean value of (4.9±0.7 hour).

The total paracetamol (mg/kg) in the studied groups was significantly different where p value (<0.001). Group D<sub>1</sub> showed lower paracetamol consumption in comparison with group C with a mean value of (124.1±22.6mg/kg) and (497.5±168.2 mg/kg) respectively.

In agreement with our results Khaled and his college, 2014 studied efficacy and safety of dexmedetomidine added to caudal bupivacaine in pediatric major abdominal cancer surgery. He studied forty pediatric patients, aged 3-12 years,

weighting 10-40kg and of ASA physical status I and II scheduled for major abdominal cancer surgeries under anesthesia combined with caudal analgesia were enrolled.

As regard to postoperative requirements, our results correlated with Khled et al., 2014 also demonstrated the use of dexmedetomidine with caudal bupivacaine markedly decrease postoperative analgesic need. They found that the mean total consumption of intravenous acetaminophen rescue analgesia in the 24 hour postoperative study period was significantly decreased in group BD (dexmedetomidine group) (405.00±215.03) when compared with group B (810.35±200.93).

### References

1. McDonnell JG, O'Donnell B, Curley G, Heffernan A, Power C, Laffy JG. : The analgesic efficacy of transversus abdominis plan block after abdominal surgery: a prospective randomized controlled trial. *Anesth Analg.* 2007; 104:193-7.
2. Hebbard, P., Fujiwara, Y., Shibata, Y., & Royse, C.: Ultrasound-guided transversus abdominis plan (TAP) block. *Anaesthesia and intensive care.* 2007; 35(4), 616-618.
3. Khaled Mohamed Fares, Ahmed H. Othmen, Nelly H. Aliedin.: Efficacy and safety of dexmedetomidine added to Caudal bupivacaine in Pediatric Major Abdominal Cancer Surgery. *Pain Physician.* 2014; 17(5): 393-400.