Quantitative sensory changes induced by transversus abdominis plane block in ventral hernia repair. A prospective randomized study.

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Background and Goals of the Study

Transversus abdominis plane (TAP) block has been described as effective technique for pain management after abdominal surgery. So far, it is little known about quantitative sensory changes induces by TAP block.

The goal of this study was to assess the quantitative sensory changes induced by TAP block in ventral hernia repair.

Material and Methods

The Research Ethics Committee, Nicolae Testemitanu State University of Medicine and Pharmacy reviewed and approved the study protocol. Seventy (23 male, 47 female) consecutive adult (>18 years) patients, without cognitive impairment were enrolled in this study. Subjects (ASA 1-3) were scheduled for elective ventral hernia repair with general anesthesia (induction thiopental or propofol, and opioids (fentanyl), maintained with a mixture of air/O2/sevoflurane, NMBA – atracurium).

Patients were randomly allocated to receive TAP block (case group – 35 subjects) or systemic analgesic drugs (control group - 35 subjects) for postoperative pain treatment. Case group subjects received bilateral USG-guided TAP block with bupivacaine (1 mg/kg per each site). TAP block was performed after the induction of anesthesia before surgery. Control group subjects received morphine and AINS according to institutional pain management protocol.

The end points:

- preoperative qualitative sensory testing: pain threshold and tolerance; intensity of pain at 48°C at site of future incision;
- postoperative (day 0, day 1) quantitative sensory testing: area and width of hyper- and hypoalgesia; presence of allodynia, hyperpathia, pain intensity at 48°C, abnormal sensitive sensations around the wound.
- postoperative pain, scored on visual analogue scale (VAS) (0, 3, 6, 12, 24 hours) during rest and movement.

Results

Data sets from all 70 subjects were included in final analysis. There was no differences in demographic characteristics and results of preoperative qualitative sensory testing.

VAS score was lower in case vs. control group at rest (Table 1) and movement (Table 2).

Group	Mean postoperative VAS at rest				
	0h	3h	6h	12h	24h
TAP	10.7	12.8	12.3	12.3	12.5
Non-TAP	44.0	41.0	35.0	35.7	31.0
P-value	p<0.000001				

Table 1. Postoperative VAS score at rest

Group	Mean postoperative VAS at movement				
	0h	3h	6h	12h	24h
TAP	19.6	22,5	21,8	22,4	21,8
Non-TAP	53.0	51.0	45.0	45.0	37.0
P-value	p<0.000001				

Table 2. postoperative VAS score at movement

We didn't identify any differences in preoperative qualitative sensorial testing between study groups. The results for postoperative quantitative are presented in Fig. 1-8.

Conclusions

Our results show that TAP reduce pain experience in first 24 hours after the surgery, subjects in case group developed an area of hypoalgesia of anterior wall, those in control group have developed an area of hyperalgesia of anterior wall.