Impact of remifentanil application modality on postoperative pain after breast conserving surgery

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Background and Goal of Study: Continual remifentanil use in anesthesia is related with postoperative hyperalgesia and opioid tolerance.

Objectives:
Study investigate whether lowering remifentanil dose at the end of surgery impact on pain decrease, need for rescue analgesics and nausea appearance in postoperative period.

Methods:
Study design
25 female patients, ASA 2 class, breast conserving surgery in general anaesthesia, between January and October 2015.
Premedication: with atropine and midazolam.
Prevention of acute emesis: Klometol and dexason 30 minutes before surgery.
Anesthesia induction: Propofol 1.5-2.5mg/kg and remifentanil 1mcg/kg/min, laryngeal mask .
Anesthesia maintaince: Propofol and remifentanil in dose: group A (13/25) fixed dose: 0.4mcg/kg/min to the end of surgery, and in group B (12/25) from last 30 minutes of surgery, on every 10 minutes, remifentanil was gradually lowered from 0.4 to finally 0.1 mcg/kg/min. The infusions of propofol and remifentanil were terminated at skin closure. All patients transfered ro recovery room.
Pain prevention: Tradamol 100 mg intravenously in both groups 15 min before end of surgery. Ketorolac was rescue analgesic.
Pain intensity was measured with visual analogue scale for pain (VAS) in rest and after arm movement.
Postoperative nausea and vomiting was measured by modified visual analogue scale for pain (VAS) and by anesthesiologist and nurses.

Statistical Analysis
Fisher’s exact test and Wilcoxon rank sum test with continuity correction are used to test differences between groups.

Results and Discussion:
Average patients age 48.67, average BMI 24,20.
A group (52%), average age 49.1, average BMI 24.07, B group (48%), average age 47.4 and BMI 24.50. Average surgery time was 81.9 min, Tabel 1.
There was statistically significant decrease in average pain score after arm movement and in rest in first 24 h between gruop B and A (2.07 vs. 4.0, p < 0.05) and (1.04 vs. 3.0, p < 0.05).
Rescue analgesic use in first postoperative hour, in B vs A group was 1 vs 3 patients, p< 0,01. One hour after dose of rescue analgesics pain score was B vs. A group 0 vs. 0.6, p < 0.05., Tabel 2.
Nausea in 24h in B vs. A was 1.20 vs 3.40, p < 0.01, Tabel 3.

References:
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3. Zhao M, et al. Enhancement of spinal N-methyl-D-aspartate receptor function by remifentanil action at delta-opioid receptors as a mechanism for acute opioid-induced hyperalgesia or tolerance. Anesthesiology. 2008;109(2):308-17.

Conclusion(s):
Gradual lowering of remifentanil 30 minutes before end of surgery significantly decreased pain score, nausea and use of rescue analgesics.

Patients details	A group (13/25)	B group (12/25)	p
N (%)	52	48	>0.5
BMI	24.07	24.5	>0.5
OT (min)	78.7	85.1	>0.5
RRS (min)	61	54	>0.5
LOS	2.35	2.30	>0.5

Tabel 1. BMI-Body Mass Index, OT-Operation Time, RRS-Recovery Room Stay, LOS-Length of hospital Stay

Pain	A group (mean VAS)	B group (mean VAS)	p
Rest	3.0	1.04	<0.05
AM	4.0	2.07	<0.05
RA (<1h)	3.0	1.0	<0.01
>1h after RA	0.6	0	<0.05

Tabel 2. AM-Arm Movement, RA-Rescue Analgesic

Nausea	A group (mean VAS)	B group (mean VAS)	p
1h	4.50	4.30	>0.5
24h	3.40	1.20	<0.01

Tabel 3.

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