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Effects of different frequencies of TEAS on perioperative anesthetic dosage, recovery, complications and prognosis in patients who underwent VATS lobectomy: A randomized, double-blinded, placebo-controlled trial

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Objective: To investigate the specific effects of different frequencies of transcutaneous electrical acupoints stimulation (TEAS) on perioperative anesthetic dosage, recovery, complications, and prognosis in patients who underwent video-assisted thoracic surgical (VATS) lobectomy.

Methods: 80 patients with no previous experience of TEAS or acupuncture undergoing VATS lobectomy were randomly assigned into four groups: control, 2/100Hz, 2Hz and 100Hz groups. The experimental group received TEAS for 30 minutes right before induction, during the entire intraoperative period, for another 30 minutes at 24 and 48 hours after surgery respectively. TEAS were given over acupoints Neiguan(PC6), Hegu(LI4), Lieque(LU7) and Quchi (LI11) sick-laterally. The control group received zero frequency of TEAS, while the 2/100Hz, 2Hz and 100Hz groups used 2/100Hz, 2Hz and 100Hz stimuli frequency respectively. Anesthetic dosage, blood gas analysis results, lung function indexes such as FEV1 and FVC, post anesthesia care unit (PACU) status, postoperative complications, and quality of life scores were collected and analyzed statistically.

Results: Intraoperative opioid consumption was significantly decreased in 2/100Hz group (vs Con $p \leq 0.001$, vs 2Hz $p \leq 0.001$, vs 100Hz $p=0.026$). During one-lung ventilation arterial oxygen partial pressure (PaO2) showed slower decreasing pattern in 2/100Hz group (vs Con $p=0.042$). Moreover, 2/100Hz group showed shorter extubation time (vs Con $p=0.038$), lower VAS score (vs Con $p=0.047$) and shorter PACU stay time (vs Con $p=0.043$) right after surgery. Meanwhile 100Hz group revealed a reduced incidence of postoperative nausea and vomiting (PONV) (vs Con $p=0.044$).

Conclusions: TEAS are a safe and non-invasive adjunctive intervention in the anesthesia management for patients undergoing VATS lobectomy. TEAS at 2/100Hz is more potent in decreasing intraoperative opioid dosage and slowing down PaO2 decrease during one-lung ventilation. It can also effectively decrease the pain score and extubation and PACU stay time right after surgery. 100Hz TEAS can decrease the morbidity of PONV.

Biography

Shun Huang has her expertise in evaluation and passion in improving the Chinese medicine especially acupuncture. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving perioperative analgesia. She has built this model after years of experience in research, evaluation, teaching and administration both in hospital and education institutions. The investigation is based on transcutaneous electric acupoint stimulation which is a methodology that utilizes the acupoints effects to patients for improving the recovery of them.

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