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Analgesia Nociception Index (ANI): Assessment of Acute Postoperative Pain

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BACKGROUND AND AIM: Patient self-rating based scales such as numerical rating scale (NRS), visual analog scale (VAS), Wong-Baker FACES scale that are used for postoperative pain assessment may be problematic in pediatric, geriatric or critically ill patients with communication problems. So, a method capable of the assessment of pain in objective manner has been searched for years. Analgesia Nociception Index (ANI), based on electrocardiographic data reflecting parasympathetic activity has been proposed for the assessment of acute nociception and pain. It is displayed as a score from 0-100, reflecting parasympathetic activity, so the ANI values decrease with pain. In this study we examined ANI as a modality for the evaluation of acute postoperative pain, and its correlation with NRS.

METHODS: A total of 120 patients of ASA physical status I and II undergoing any surgical procedure under halogenated-based anesthesia with fentanyl or remifentanil were enrolled for the study. At the 15th minute of arrival to the postoperative care unit (PACU) the patients' pain was rated on a 0-10 point NRS. The patients' heart rate (HR), blood pressure (BP), and ANI scores were simultaneously measured at that time. The correlation between ANI, HR, BP and NRS was examined.

RESULTS: The study was completed with 107 patients, of which 46 were males (43%). Mean (SD) ANI values were significantly higher in patients with initial NRS ? 3, compared with NRS > 3 [69.1 (13.4) vs 58.1 (12.9), respectively, $P < 0.001$]. A significant negative linear relationship ($r2 = -0.312$, $p = 0.001$) was observed between ANI and NRS.

CONCLUSIONS: ANI measurements at postoperative period after volatile agent and opioid-based anesthesia correlate well with subjective NRS scores. ANI measurement in PACU is a simple and non-invasive method in predicting moderate-to-severe acute postoperative pain, and guiding analgesic interventions.