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Quantitative Pupillometry is Not Impacted By IV Opioid or Sedative Bolus Dosing

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Objective:

Evaluate effect of intermittent intravenous opioids and sedatives on Neurological Pupil Index (NPi) using Quantitative Pupillometry (QP).

Background:

Opioids and sedatives are widely used in the Neuroscience ICU (NSICU). NPi, an objective measurement of pupillary light reflex (PLR), is a critical component of the neurologic examination and is measured routinely using QP. Yet whether NPi values are affected by opioid or sedative bolus in acutely ill patients is unknown.

Design/Methods:

Prospective, observational, pragmatic study of adult patients (≥18 years old) admitted to the NSICU with any admission diagnosis who received bolus doses of IV opioids or sedatives. 100 patients will be enrolled for final analysis. NPi was assessed using the NPi-300 pupillometer within 30 minutes prior to and 15 minutes after administration of IV opioid or sedative administration. Opioids and sedatives utilized include hydromorphone, fentanyl, morphine, and midazolam. Descriptive data were obtained for demographics. Paired t-test was used to compare pre and post NPi values.

Results:

39 patients were included in the interim analysis: 54% female, median age 48 (IQR 39-65). Of 39 patients, 35 (90%) received hydromorphone, 2 (5%) received morphine, 1 (2.5%) received fentanyl, and 1 (2.5%) received midazolam. Mean premedication NPi of the RIGHT eye was 4.25 (0.47), and mean premedication NPi of the LEFT eye was 4.27 (0.47). Mean post-medication NPi of the RIGHT eye was 4.26 (0.47), P=0.73. Mean post-medication NPi of the LEFT eye was 4.27 (0.46), P=0.99. Numbers in parenthesis represent standard deviation unless otherwise noted.

Conclusions:

NPi does not significantly differ from before to after administration of bolus IV opioids or sedatives. Significant changes in NPi are unlikely to be related to medication administration and should be correlated clinically.