THE GENETICS OF POSTOPERATIVE NAUSEA AND VOMITING
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Introduction: Postoperative nausea and vomiting (PONV) has long been a concern for perianesthesia nurses. It is a strong predictor for unanticipated admission for ambulatory surgical patients and delayed discharge from the post anesthesia care unit (PACU).

Problem: PONV risk factors are well documented, and include female gender, nonsmoker, history of PONV or motion sickness and postoperative opioids. But even knowing these predictors and providing appropriate antiemetic protocols, 20-30% of patients continue to experience PONV.

Purpose: To explore the association of variability in the CYP2D6 and mu-opioid receptor genes with PONV in adult patients admitted for repair of a single, isolated orthopedic injury.

Methodology: 112 subjects were recruited in the preoperative holding area. PONV was assessed 45 minutes after admission to the PACU and 48 hours after surgery. Saliva was collected for DNA extraction. Based on genetic analysis, subjects were assigned a CYP2D6 classification of poor metabolizer (PM), intermediate metabolizer (IM) or extensive metabolizer (EM).

Results: 56 (50%) of subjects experienced PONV in the 48 hours following surgery. Seven percent of patients were PM’s; 30% were IM’s; and 63% were in the EM group. Using the CYP2D6 EM group as the reference, logistic regression analysis revealed a significant difference with the CYP2D6 PM group for presence of PONV (p=0.03). ANOVA results showed mean total opioids adjusted for weight were significantly different across the three CYP2D6 groups (p=0.03), with an inverse relationship to ondansetron dose. Variability in the mu-opioid receptor gene was not a predictor for PONV, but there was a strong trend for subjects with the wild type allele to have increased PONV.

Conclusions/Discussion: Subjects classified as poor metabolizers required more opioids for pain, but experienced less PONV when compared to the other groups, and subjects who experienced more PONV required less pain medications. The high percentage of PONV within 48 hours of surgery is significant for perianesthesia nurses who discharge patients following surgery.

Implications: CYP2D6 is responsible for metabolizing many opioids and anti-emetic agents. Increasing our understanding of potential genetic differences will provide perianesthesia nurses the ability to tailor the environmental variables (medications, treatments) for effective, individualized postoperative care.