Pharmacogenetics of Postoperative Nausea and Vomiting
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Abstract

Postoperative nausea and vomiting (PONV) remains one of the most common adverse effects of anesthesia, affecting up to 80% of high-risk patients within 24 hours after surgery. Patient-related factors, surgical procedure, and perioperative medications such as opioids determine a patient's risk for PONV. To prevent and manage PONV, ondansetron, a 5-hydroxytryptamine type 3 (5-HT3) receptor antagonist, is frequently administered. Ondansetron is metabolized predominantly by hepatic cytochrome P450 (CYP2D6) enzymes, encoded by the CYP2D6 gene, whereas most of the effects of opioids are exerted at the opioid mu-1 receptor, encoded by the OPRM1 gene. Genetic polymorphisms of the CYP2D6 and OPRM1 genes may have a role in interindividual variation in the occurrence of PONV. Specifically, the occurrence of the G-allele produced by the OPRM1 A118G appears to be protective against PONV, whereas CYP2D6 ultrarapid metabolism increases the risk for PONV. The Clinical Pharmacogenetics Implementation Consortium guidelines provide CYP2D6-guided therapeutic recommendations for ondansetron. However, further studies are needed to investigate the role of genetic polymorphism in the occurrence of PONV and response to antiemetics.