

# Association Between Serotonin Transport Polymorphisms and Postdischarge Nausea and Vomiting in Women Following Breast Cancer Surgery

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**N**ausea and vomiting are two of the most common and debilitating side effects following surgery. About half of all patients experience postoperative nausea and vomiting (PONV) during the 24 hours following surgery, or postdischarge nausea and vomiting (PDNV) when they return home following surgery (Cruthirds, Sims, & Louis, 2013). About 80% of patients are considered high-risk, particularly women nonsmokers with a positive history of PONV and who use opioids for relief of pain (Apfel, Korttila, et al., 2004). Opioids given for postoperative pain often are considered the primary cause of PONV (Watcha & White, 1992). Women with breast cancer undergoing mastectomy are particularly high-risk for PONV, with a reported incidence rate of 60%–80% in patients receiving no antiemetic medications (Lee et al., 2008).

PONV and PDNV can lead to aspiration; wound dehiscence; bleeding; hematoma; dehydration; electrolyte imbalance; exhaustion; and delayed mobilization, recovery, and ability to begin oral medications (Jolley, 2001; Miaskowski, 2009). PONV is one of the strongest predictors of prolonged hospital stays and unanticipated admission for outpatients following breast cancer surgery (Marla & Stallard, 2009), accounting for millions of dollars of healthcare costs annually (Apfel, Kranke, & Eberhart, 2004). For some women with breast cancer, PONV and PDNV can be more problematic than pain. In scenario studies, when surgical patients were given limited amounts of money to hypothetically “buy away” potential postoperative complications, nausea and vomiting were chosen before pain (Kerger et al., 2007; Macario, Weinger, Carney, & Kim, 1999). Patients with nausea also reported greater impairment in quality of life and psychological distress (Pirri et al., 2013).

The American Society of Clinical Oncology indicated that the goal for managing treatment-induced nausea and vomiting (from surgery, chemotherapy, or radiation) should be complete antiemetic response (Basch et al.,

**Purpose/Objectives:** To examine the association of the serotonin transport gene and postdischarge nausea and vomiting (PDNV) in women following breast cancer surgery.

**Design:** A cross-sectional study.

**Setting:** A comprehensive cancer center in Pittsburgh, PA.

**Sample:** 80 post-menopausal women treated surgically for early-stage breast cancer.

**Methods:** Data were collected using standardized instruments after surgery but before the initiation of chemotherapy. Blood or saliva were used for DNA extraction and analyzed following standardized protocols. Data were analyzed using descriptive statistics and logistic regression.

**Main Research Variables:** Serotonin transport gene (*SLC6A4*), nausea, vomiting, pain, and anxiety.

**Findings:** Women who inherited the  $L_A/L_A$  genotypes were at greater risk for nausea and vomiting when compared to women who carried any other combination of genotypes. Twenty-one percent of women reported nausea and vomiting an average of one month following surgery and prior to initiation of adjuvant therapy. Those women who experienced PDNV reported significantly higher anxiety and pain scores.

**Conclusions:** Findings of this study suggest that variability in the genotypes of the serotonin transport gene may help to explain the variability in PDNV in women following breast cancer surgery and why 20%–30% of patients do not respond to antiemetic medications.

**Implications for Nursing:** Nurses need to be aware that women who do not experience postoperative nausea and vomiting following surgery for breast cancer continue to be at risk for PDNV long after they have been discharged from the hospital, and this frequently is accompanied by pain and anxiety.

**Key Words:** nausea/vomiting; genetics; breast cancer  
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2011). However, even when the best available antiemetic medications are applied correctly, that goal has remained elusive (Gan et al., 2007). Documented risk factors for PDNV differ slightly than those for PONV, and include