

ORIGINAL ARTICLE

Acupressure in Management of Postoperative Nausea and Vomiting in High-Risk Ambulatory Surgical Patients

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Purpose: The purpose of this randomized blinded placebo-controlled research study was to investigate the effect of acupressure over 24 hours postoperatively for ambulatory surgical patients who are identified as high risk for PONV.

Design: A randomized blinded placebo-controlled study design was implemented.

Methods: Study enrollment criteria included four of five risk factors as defined in 2006 by American Society of PeriAnesthesia Nurses PONV/postdischarge nausea and vomiting guidelines: female, PONV history or motion sickness, nonsmoker, and volatile gas general anesthetic. One hundred ten patients were randomly assigned to an intervention ($N = 57$) acupressure bead patch or control ($N = 53$) sham acupressure patch group. Patients rated PONV on scale (0 to 10).

Findings: Acupressure use at P6 preoperatively was statistically significant in reducing PONV in all three postoperative phases. One hundred ten patients were enrolled; 93 patients finished the study's three phases and nine were admitted postoperatively.

Conclusions: Acupressure is an effective minimal risk and low-cost adjunctive therapy for prevention and treatment in ambulatory surgical patients at high risk for PONV. Further studies using other acupressure points should be conducted.

Keywords: postoperative nausea and vomiting, ambulatory surgery, Chinese Medicine, complementary alternative methods.

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IN THE UNITED STATES, more than 60% of the 79 million surgical procedures performed annually occur in an ambulatory day surgery setting.¹ One of the most common and distressing symptoms experienced after surgery is postoperative nausea and vomiting (PONV), which is at the top of adverse outcomes after routine outpatient surgery.^{2,7-9} PONV is a major factor limiting early

discharge of ambulatory surgical patients and is a leading cause of unanticipated hospital admissions (24% primary reason). Uncontrolled PONV can result in pulmonary aspiration in an unprotected airway, electrolyte imbalances, suture line tensions causing hematomas and wound dehiscence, delayed discharges, and unplanned, possibly unnecessary hospitalizations.²⁻⁶

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Conflict of interest: None to report.

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1089-9472/\$36.00

<http://dx.doi.org/10.1016/j.jopan.2015.09.010>

Risk and Incidence of PONV

The American Society of PeriAnesthesia Nurses (ASPA) has identified factors that contribute to a patient being at high risk for PONV.³ They include the following: female, nonsmoker, history of PONV or postdischarge nausea and vomiting (PDNV) and/or motion sickness, planned volatile gas anesthesia (general or nitrous oxide), and postoperative opioid pain management. Each risk factor increases chance of PONV increasing to 80% incidence with four risk factors present.^{3,4}

Despite anesthetic and surgical advances, the estimated incidence of PONV is as high as 30% for low-risk patients and 80% for high-risk patients.^{2,3,5} PONV incidence increases with each additional risk factor, thus underscoring the need for assessment and preventative intervention.³ New drug therapies show promise in controlling early PONV, yet nearly half of patients may experience PDNV. A large prospective study of 2,170 outpatient surgical patients in 12 US centers found that the most under-recognized problem is PDNV lasting more than 48 hours.⁵

PONV is the top-ranking fear patients express before elective surgery. Additionally, it is rated by patients as being more debilitating than postoperative pain or the surgery itself. When faced with a choice between pain and PONV, many patients will choose to experience pain. It was found that patients were willing to pay \$56 to \$100 out of pocket to avoid PONV.⁶⁻⁸ PONV is not only experientially distressing but also costs, on average, an additional \$400+ per patient.⁵ PONV costs have been estimated at \$1.2 billion a year in the United States alone. A single episode of nausea costs an average of \$82, and a single episode of emesis costs an average of \$305.^{2,5,7,9-11} PONV results in an estimated 47 to 61 extra minutes in the postanesthesia care unit (PACU), further increasing cost and delays of efficient flow.² The biggest cost is PACU personnel, not pharmaceuticals.^{9,11} Despite the best efforts of pharmaceutical development, there is no current drug available to eliminate PONV. In a meta-analysis, it was found that even the most common antiemetics administered prophylactically (droperidol, ondansetron, and/or metoclopramide) were unable to reduce PONV incidence to less than 40%.¹²

Prevention and Treatment of PONV

ASPA has created algorithms for PONV/PDNV that recommend the use of prophylactic and rescue antiemetics, including droperidol, ondansetron, metoclopramide, and decadron.^{3,13} However, serious side effects have been reported with the standard pharmacologic treatment of PONV. The side effects of phenothiazines, anticholinergics, benzamides, and butyrophenones can include constipation, headache, agitation, extrapyramidal effects, sedation, tachycardia, prolonged QT intervals, and fatal arrhythmias.¹⁴

Many Americans use treatments that are not part of mainstream medicine, referred to as complementary alternative medicine (CAM) or integrative medicine. The efficacy of CAM in reducing PONV shows more benefit than harm with fewer side effects than rescue antiemetic pharmaceuticals. Although clinical investigations continue to focus on more effective antiemetic drugs, the side effects and questionable effectiveness suggest that CAM methods should not be overlooked.¹⁵⁻²⁴

Acupressure, an energy CAM, has shown promising results in relieving PONV in various surgical populations.^{12,19,23-37} It is a variation of acupuncture based on more than 3,000 years of traditional Chinese medicine and involves applying pressure on points without puncturing skin. These *acupoints* correspond to invisible circuitry of channels (meridians) that conduct energy (*qi*) to specific anatomic regions as shown in Figure 1. When meridians are disturbed, for example, *qi* flow is too slow, fast, turbulent, or static; the imbalance causes phenomena, such as nausea, vomiting, pain, and so on. From the Eastern perspective, acupressure is believed to stimulate or interrupt energy, thereby altering responses to negative stimuli, whereas the Western medicine focuses on the mechanism of action that involves the triggered release of endogenous endorphins.²⁷

Research Questions

1. Does preoperative placement of acupressure beads at P6 affect the incidence and severity of PONV immediately after surgery (Phase I) in high-risk ambulatory surgical patients compared with usual care of preventative and rescue antiemetics?

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