

Nausea and Vomiting Treatment after Surgery

We Still Can Do Better

POSTOPERATIVE nausea and vomiting was introduced as a MeSH heading in 1999, though in 1946, in this very journal, an article on the topic already appeared.¹ Initially the topic was thought of as a problem seen within 24 h after surgery. Postdischarge nausea and vomiting (PDNV) is defined as a problem that occurs after a patient has left the hospital. Some who do not have postoperative nausea and/or vomiting (PONV) while in the hospital might still experience PDNV once they are home. In the current issue, in a report published by Apfel *et al.*, a prediction model for determining who might experience PONV and PDNV after surgery in an ambulatory surgery center was developed.² Patient-specific risk factors were similar for both PONV and PDNV: women, individuals whose age was less than 50 yr, and patients with a history of PONV were more likely to develop PONV or PDNV. Nonsmoking status did not independently predict who might develop PDNV.

Although the concept of PDNV has been studied for at least 15 yr, to many it is not apparent how pervasive the problem is. Indeed, once a patient leaves the ambulatory surgery center, our direct contact with the patient is minimal. Up to 50% of patients have nausea and vomiting after they leave the ambulatory surgery center.³ Resumption of normal activities does not occur until this problem has been resolved.⁴

In medicine, we love to make and use scores. The Apgar, Aldrete, and APACHE scores come first to mind, though there are many others. Scores are useful, in part, because they allow information to be quickly transmitted. It is easier to say that an infant has an Apgar score of 3 than telling the listener that the infant's heart rate is less than 100, respirations are weak, there is some flexion, and the infant has no response to stimulation and is blue. If we heard the number 3, we would probably jump to action more quickly than if we had to listen to the entire list. Yet until now a score to predict who has PDNV has not been devised. Therefore, this newly devel-



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oped score on PDNV will be very useful. With the exception of the nonsmoking status, it is interesting, though not surprising, that the basis for this score is not that different from the score used for PONV. From previous studies we know that the type of general anesthesia can affect PONV.⁵ What is not clear is whether type of general anesthesia can also affect PDNV. When propofol is used instead of an inhalation agent and nitrous oxide is not used, the risk in PONV reduction is similar to that seen after treatment with a single antiemetic.⁵ It is easy and convenient to conduct anesthesia with a vaporizer – all that is required is to turn the dial, although it is important to make sure that the vaporizer is filled. Propofol is now a generic drug and is not that much more expensive than an inhalation agent. In one study of patients undergoing outpatient gynecologic laparoscopy, patients who received total intravenous anesthesia, no paralysis, as well as ondansetron, droperidol, and dexamethasone, had no retching or vomiting in the post-anesthesia recovery unit, although 5% had nausea in the post-anesthesia recovery unit and 12% had vomiting after discharge.⁶ In another study of patients undergoing elective gynecologic laparoscopy, although a nitrous oxide–isoflurane anesthetic was less expensive than a propofol–air–oxygen anesthetic, the cost difference was trivial, and more patients who received isoflurane were nauseous.⁷ The same could be said about all inhalation agents, and most others are more expensive than isoflurane.

Some claim that a propofol-based anesthetic is more popular outside the United States because of the availability of target-controlled infusions. If the bispectral index monitor is used, anesthesia depth and hemodynamic stability are not different compared with target-controlled infusions.⁸ Admittedly, fewer interventions may be required when target-controlled infusions are used.⁹ Certainly, a propofol-based anesthetic has other advantages: the incidence of emergence

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delirium is lower, there is less exposure to atmospheric pollutants, the environmental footprint is lower, and coughing and laryngospasm occur less commonly. If we care about our patient's PONV after the procedure, a total intravenous anesthesia technique should be employed much more. In the current study of patients who underwent surgery in ambulatory surgery facilities, all received an inhalation agent. It is unclear how different the PDNV score would have been if propofol was used for anesthesia maintenance instead of an inhalation agent. Would PDNV be less if propofol was used?

PONV and PDNV are related to prophylactic antiemetic treatment. Should everyone get prophylactic treatment, or should the decision for prophylactic treatment be reserved for those with factors associated with greater postoperative PDNV, as identified by Apfel *et al.*?² Certainly many patients with PDNV may not manifest any PONV in the postanesthesia recovery unit.⁴ Furthermore, some patients may have a genetic predilection. In a study that examined the relationship of patient genome to PONV, at least one single nucleotide polymorphism was shown to predict who is susceptible.¹⁰ Whether prior knowledge of patient genome would have trumped overt patient characteristics identified in this or other similar prediction models is unclear.

Using a multimodal clinical care algorithm consisting of a total intravenous anesthetic (propofol and remifentanyl), no nitrous oxide, no neuromuscular blockade, hydration, triple prophylactic antiemetics (ondansetron, droperidol, and dexamethasone), and ketorolac, Scuderi *et al.* found that 98% of patients studied did not vomit or retch while in the postanesthesia recovery unit.⁶ In those patients described by Scuderi *et al.* who underwent laparoscopic gynecologic procedures, only 2% of patients had nausea, and no patient suffered from vomiting. Why do anesthesiologists not implement multimodal therapies, preventing and treating PONV and PDNV as vigorously as preventing and treating pain? What is the hurdle?

It is hoped that articles such as this will stimulate debate concerning how to aggressively prevent the nausea and vomiting that patients may experience after surgery. If we are aggressive about using a nonemetogenic anesthetic, and base therapy on Apfel's PONV and PDNV scores, will the model be the same? Will newer drugs be more effective and have

longer-term effects than what we currently have available? As anesthesiologists, although we can't do much about the surgery, we can control the anesthetic as well as treatment modalities. This is a call for action: Let's decrease the incidence of PONV and PDNV.

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