

ASMBS Guidelines

Postoperative nausea and vomiting in bariatric surgery: a position statement endorsed by the ASMBS and the ISPCOP

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Despite extensive research regarding risk factors and treatment regimens, postoperative nausea and vomiting (PONV) has remained a challenge affecting up to 40% of the general surgical population, underlining the complex nature of this adverse outcome [1]. In addition to the criteria described by Apfel et al. [1], contributing risk factors may be anesthesia, patient, or procedure related. Compared with the general surgical population, patients undergoing bariatric surgical procedures experience a much higher incidence of PONV, and current enhanced recovery after bariatric surgery (ERABS) guidelines suggest intraoperative prophylaxis but provide little guidance for postoperatively administered prophylaxis or treatment [2]. This article does not address PONV as a result of mechanical upper gastrointestinal obstruction or other structural complications from the surgical procedure itself, and nontraditional

treatments such as acupuncture or acupressure are only briefly described.

This position statement aims to make specific recommendations regarding PONV prophylaxis and treatment prior to, during, and following bariatric surgery to improve postoperative outcomes. This work resulted from a collaboration of members of the International Society for the Perioperative Care of the Patient with Obesity (ISPCOP) and the American Society for Metabolic and Bariatric Surgery (ASMBS) and was subsequently coendorsed by the boards of both learned societies. It may serve to expand on current ERABS guidelines and suggest future research directions regarding PONV and postdischarge nausea and vomiting (PDNV).

Do patients undergoing bariatric surgery have a different PONV risk than the general surgical population?

In the bariatric surgical population, PONV occurs at a rate of nearly 80% compared with up to 40% in the general surgical population [3,4]. Laparoscopic sleeve gastrectomy appears to be the most emetogenic of all standard bariatric surgical procedures [3,5,6].

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Although obesity is not a risk factor for PONV [6], patients undergoing bariatric surgery are more likely to experience PONV than their peers of normal weight range undergoing gastric procedures [7]. Besides the direct effect on patient comfort and satisfaction, PONV prolongs the time spent in the post-anesthesia care unit (PACU) and is a common cause for readmission after metabolic and bariatric surgery [8–10].

The requirement for a rescue antiemetic in the PACU may contribute further to a prolonged discharge time until emesis control is achieved.

Recommendation

- Clinicians should be mindful of the unique PONV risk profile for bariatric surgery that may necessitate a more aggressive perioperative approach compared with the currently established routine management for the general surgical population.

What is a recommended intraoperative pharmacologic PONV prevention strategy for a patient undergoing bariatric surgery without patient-related risk factors?

For bariatric surgery, intraoperative antiemetic prophylaxis based on the risk scores described by Apfel et al. [1] does not sufficiently meet outcome expectations. At least one study showed that prophylaxis according to current guidelines still resulted in a greater than 80% PONV risk that remained at nearly 60% even with maximal prophylaxis [4,6]. Considering the unresolved high incidence of PONV beyond that expected for a general surgical population, it appears justified to use prophylaxis even in patients without obvious risk factors undergoing bariatric surgery. Further studies to determine effective multimodal pharmacologic antiemetic strategies are urgently needed for this specific patient population. Effective prophylaxis and treatment of PONV require a multimodal approach using multiple medications from different drug classes [11,12]. In the absence of further guiding data, the routine intraoperative use of at least 2 if not 3 antiemetics from different pharmacologic categories seems indicated. Pharmacologic categories include but are not limited to 5-hydroxytryptamine (5-HT₃) receptor antagonists, neurokinin-1 (NK1) receptor antagonists, antidopaminergic agents, corticosteroids, H1 receptor antagonists, piperazines, phenothiazines, and anticholinergics.

Recommendations

- Administer at least 2 or 3 antiemetics from different pharmacologic categories even in the absence of patient-related risk factors.
- Consider adding additional antiemetics for each patient-related risk factor encountered.

- For the high-PONV-risk patient, additional measures, and strategies are necessary as recommended below.
- Support urgent research into effective intraoperative multimodal pharmacologic antiemetic regimens specific to the bariatric population.

What is the role of single-dose dexamethasone, what dose should be considered, and should it be given to patients with diabetes mellitus?

Dexamethasone is an established prophylactic antiemetic in bariatric surgery and is usually administered intraoperatively [13,14]. At doses above .1 mg/kg up to a total of 8 mg, dexamethasone is an effective adjunctive analgesic and reduces postoperative pain and opioid consumption [14], which may arguably improve pain and opioid-induced PONV, but definitive scientific evidence has not yet been established.

There are reports of increased perioperative blood glucose levels with the intraoperative administration of up to 8 mg of dexamethasone, particularly in patients with impaired glucose tolerance [15,16]. However, an adverse effect from a single intraoperative dose of dexamethasone such as sustained hyperglycemia in patients with and without diabetes, increased surgical-site infections, delayed wound healing or mental status changes are unlikely, and the benefits for the prevention of PONV likely outweigh these concerns [17].

Recommendation

- Dexamethasone should be administered routinely early intraoperatively for PONV prophylaxis at a dose of at least 4 mg but no more than 8 mg unless contraindicated.

What is a recommended prophylactic intraoperative strategy for the high-PONV-risk patient during bariatric surgery?

The introduction of ERABS protocols reduces the risk of PONV [18]. However, even patients treated according to ERABS protocols and receiving an opioid-sparing anesthetic with perioperative multimodal and regional analgesia still had a 46% incidence of PONV [19]. This is much higher than the expected rate of less than 10% for most surgical procedures despite following current recommendations [12]. An evidence-based guideline specific to the intraoperative prophylaxis of PONV for patients with high PONV risk undergoing bariatric surgery does not yet exist. However, using a total intravenous anesthesia (TIVA) instead of a volatile anesthetic is an effective component of a multimodal antiemetic strategy in bariatric surgery and will likely benefit outcomes for patients with high PONV risk [20]. Additional evidence in unselected patients undergoing bariatric surgery demonstrated that during

TIVA, the combination of intraoperative dexamethasone and ondansetron was not more effective than placebo for preventing PONV, suggesting that TIVA may have a strong protective effect that is difficult to improve on [21].

Research is needed to determine the efficacy and safety of approaches that include additional pharmacologic agents or nontraditional methods for patients at high risk for PONV.

Recommendations

- Consider the more widespread adoption of TIVA and non-opioid techniques in patients at high risk for PONV.
- Consider additional antiemetics prior to emergence in high-risk patients and supplementation of the strategy with nontraditional methods.
- Facilitate research to establish evidence-based safe and effective antiemetic protocols when additional patient-related PONV risk factors are present.

What are lessons learned from approaches for outpatients receiving bariatric surgery?

Outpatient or ambulatory bariatric surgery requires selection of an appropriate surgical candidate and established processes for patient preparation, intra- and postoperative management, hospital transfer, readmission, and follow-up care [22]. PONV is responsible for extended stay at the facility or readmission in up to 20% of patients [23]. In the ambulatory surgical setting, initiation of PONV and postdischarge nausea and vomiting (PDNV) prophylaxis is intended to begin even prior to the patient's arrival at the facility to maximize antiemetic efficacy. It may include pretreatment with a NK1 receptor antagonist and/or application of a transdermal scopolamine patch [24–26]. Because PONV and PDNV are equally undesirable whether the patient is an outpatient or not, preoperative preemptive treatments should be applicable to all patients presenting for bariatric surgery.

Recommendations

- NK-1 antagonists and an anticholinergic transdermal scopolamine patch should be considered prior to the patient's arrival at the facility.
- For patients presenting for outpatient bariatric surgery, to avoid prolonged stay and/or hospital admission or readmission, preoperative proactive multimodal antiemetic prophylaxis is indicated.

What is a reasonable approach to the management of patients when PONV prophylaxis and standard postoperative treatment were unsuccessful?

Patients following bariatric surgery with unknown extreme sensitivity to surgery and anesthesia may not

respond to advanced intraoperative antiemetic prophylaxis and rescue treatment in the PACU as outlined earlier. This situation may require a team reassessment of the patient, the environment for continued care, and additional available treatment options. This may include decelerating the discharge process with potential inpatient admission and further multidisciplinary care.

The use of rescue drugs with a pharmacologic mechanism of action that is different from the drugs already employed needs to be considered. Nontraditional pharmacologic and nonpharmacologic measures may be helpful [27,28]. First-generation and possibly sedating antiemetic compounds such as promethazine, cyclizine, and dimenhydrinate all may have a role as rescue therapy, after considering their adverse effects, risks, and benefits in this situation [29,30]. Extrapolating from the nonobese surgical population, a non-sedating temporary low-dose propofol infusion may be useful in these challenging patients [31].

For patients who are permitted early postoperative oral administration of medications, the combination of a selective NK1 receptor antagonist such as netupitant with a 5-HT₃ receptor antagonist such as palonosetron may be successful. This combination has been proven effective in patients undergoing chemotherapy, but it has not been tested to treat patients after bariatric surgery with persistent PONV [32].

Recommendations for patients with persistent postoperative PONV

- Multidisciplinary care planning with discharge deceleration and admission option.
- Multidisciplinary patient reassessment to rule out mechanical or iatrogenic causes for persistent PONV [12]
- Consider the side effects such as sedation and the risks and benefits of first-generation antiemetics including antihistamines, phenothiazines, and piperazines for rescue [29,30]

Is there a dosing scalar for most antiemetics in this population?

A weight-independent dose of both ondansetron and droperidol may be safely and effectively administered, but with combined doses it is recommended to observe the patient for side effects including QTc prolongation. This latter adverse effect may be mitigated by the use of amisulpride instead of droperidol because it apparently lacks QTc-prolonging properties [12]. Antiemetic prophylaxis and treatment with fixed doses established for the general surgical population may be more convenient, equally effective, and less predisposed to dosing errors than weight-adjusted dosing, which requires individual dose calculations. The latter was reported for palonosetron in a comparative study specific to a weight-based versus a standard dosing regimen in women with obesity [33]. A large meta-analysis reporting on

controlled trials regarding drug regimens for PONV prophylaxis in the bariatric surgical population documents that mostly standard antiemetic doses were applied irrespective of weight [11]. There is currently insufficient evidence to suggest that a weight-based dose adjustment may be needed for most antiemetics to be effective or have improved efficacy in bariatric surgical patients. In contrast, it is possible that part of the high PONV incidence in these patients may be a reflection of relative underdosing. Further study is needed to better understand antiemetic dose requirements for patients with severe obesity.

Recommendation

- The current evidence does not support weight-adjusted dosing of antiemetics for patients undergoing bariatric procedures.

What are the additional perioperative interventions to prevent and treat PONV following bariatric surgery?

Complementary therapies

Although not specifically tested in the bariatric surgical population, evidence from trials in women undergoing abdominal laparoscopic procedures suggests a role for preventive complementary methods as part of a multimodal antiemetic strategy. This may be applicable to a classic bariatric patient population, the majority of which are women. Specifically, acupressure applied to the acupoint K-K9, acupressure, or acustimulation at the P6 stimulation point and the use of 70% isopropyl alcohol pads during nasal inhalation have demonstrated measurable improvement in established PONV [27].

Anxiolysis

Patients who undergo repeated surgical procedures and have experienced refractory PONV may suffer from significant fear and anxiety that fuels their PONV. These patients may benefit from a benzodiazepine to allay their anxiety and prevent the initiation of emesis [28].

Hydration

Dehydration may be both a precipitant and a consequence of PONV. Fasting guidelines have been amended worldwide so that no elective patient should present for surgery in a dehydrated state. Evidence in the literature suggests that attention to euolemia and perioperative fluid supplementation can reduce the incidence of early and late PONV in ambulatory surgery [34].

Recommendations

- Additional low-cost methods to augment PONV prophylaxis and treatment should be strongly considered when

factors can be identified where such approaches have proven efficacy.

- Nontraditional methods may be useful in addition to established approaches.
- Nontraditional methods should be an area of active research in this population.

Conclusion

Patients undergoing bariatric surgical procedures suffer from a higher PONV incidence than the general surgical population. Although obesity and body mass index are not per se PONV risk factors, anesthesia-related risk can be reduced by anesthetic technique and antiemetic prophylaxis, and procedure-related risk can be mitigated by thoughtful, evidence-based pharmacologic and nontraditional antiemetic prevention and treatment. This position statement summarizes current evidence and provides an up-to-date approach for clinicians involved in the perioperative care of patients undergoing bariatric surgery. There is an urgent need for more research to address the significant problem of PONV in this special population.

Disclosures

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