

## Association of nausea and vomiting in between anaesthetic or patients factors in Monitored Anaesthesia Care (MAC) after gastrointestinal endoscopies in tertiary care hospital: An Audit

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### Abstract

**Introduction:** Esophagogastroduodenoscopy (EGD) is used for both diagnostic and therapeutic procedures. EGD under Monitored Anesthesia Care (MAC) is gaining wide acceptance, but nausea and vomiting remains one of the most common and distressing complications, which require additional resources and may delay in the discharge of patient from hospital. The aim of this audit was to determine the association of nausea and vomiting in between anaesthetic technique or patients factors after gastrointestinal endoscopic procedures under MAC.

**Methods:** After finishing 3 hours of endoscopic procedure one of the investigators evaluated and collects the patient's data in the ward and filled the predesigned assessment form and ticked the different variables which may have effect on nausea and vomiting.

**Results:** 130 patients were enrolled over the period of 1 year. During the all procedure we observed mild to severe nausea vomiting in those patients who have diabetes mellitus and 10 patients were need antiemetic to control vomiting.

**Conclusion:** Incidence of PONV (Postoperative nausea and vomiting) is high after endoscopy under MAC especially in those patients who has high risk factors for PONV as well as in known diabetic patients. So prophylactic antiemetic therapy should be commenced in those patients and further randomized controlled trial should be recommended to establish this relationship.

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**Keywords:** Monitored anaesthesia care, tertiary care hospital, postoperative nausea and vomiting

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## **Introduction**

Esophagogastroduodenoscopy (EGD) is a procedure during which a small flexible endoscope is introduced through the mouth (or with smaller caliber endoscopes, through the nose) and advanced through the pharynx, esophagus, stomach, and duodenum. An enteroscope, a longer endoscope, can be introduced beyond the ligament of Treitz into the jejunum. EGD is used for both diagnostic and therapeutic procedures.

There is no standard and ideal protocol for sedation and a variety of anaesthetic techniques have been described, including intravenous (i.v) or inhalational anaesthesia with or without tracheal intubation.<sup>1,2</sup> Conscious sedation is one of the commonly used methods for EGD. The use of monitored anesthesia care and propofol, fentanyl and midazolam are gaining wide acceptance because of the shorter recovery time and less incidence of nausea vomiting.<sup>3</sup>

Nausea and vomiting (PONV) remains one of the most common and distressing complications, resulting in pain, hematoma, and wound dehiscence, which require additional resources and may delay in the discharge of patient from hospital.<sup>4</sup>

## **Purpose of Audit**

The aim of this audit was to determine the association of nausea and vomiting in between anaesthetic technique or patients factors after gastrointestinal endoscopic procedures under MAC.

## **Material and methods**

After finishing 3 hours of endoscopic procedure one of the investigators evaluated and collects the patient's data in the ward and filled the predesigned assessment form and ticked the different variables which may have effect on nausea and vomiting. The severity of nausea was assessed through visual analogue Scale (VAS) in which 0 as no nausea & vomiting, 1 as mild nausea & vomiting, 2 as nausea without inquiry, 3 as vomiting occur and 4 as severe and repeated vomiting.

All adult patients more than 14 years of age who undergo upper gastro intestinal endoscopy under MAC and those in which sedation will be given by anaesthesiologist were included in the study and those patients who have their procedure under in general anaesthesia and pediatric group of patients were excluded from study.

We were also monitor certain risk factors which provoke to nausea and vomiting and we had divided them into three categories which were patients, procedural and anaesthetic factors. Patient's factors contained gender, obesity, history of chemotherapy, smoking and Diabetes mellitus. Procedural factor includes duration of endoscopy either less the one hour or more than

one hour, and procedure is diagnostic or therapeutic and anaesthetic factors contained use of opioids, Hysocine, anti emetics, nitrous oxide, propofol, midazolam and ketamine.

## Results

This audit was done for 1 year (January–December 2010). Total 130 Patients were included in the audit. Patients were checked or PONV three hours after endoscopic procedure. ASA status I were 5 (3.8%), ASA II were 65 (50%), ASA III were 60 (46%) in total number of patients. 90 (69%) patients were male and 40 (30%) were belong to females among all patients. History of smoking was reported in 19%, Diabetes was 23%, and nausea & vomiting were recorded 13% in diabetic patients, and not a single patient had a history of chemotherapy. During procedure Propofol alone used in 110 patients and combination Propofol and midazolam used 20 patients as an induction agent and sedation purpose. Fentanyl 50-75µgm was used in 50 patients as an analgesic. During the all procedure we observed mild to severe nausea vomiting in those patients who have diabetes mellitus and 10 patients were need antiemetic to control vomiting.

## Discussion

Postoperative nausea and vomiting (PONV) is one of the major problem in postoperative recovery phase.<sup>5-9</sup> In high risk population for PONV, incidence varied between 70% to 80%.<sup>10</sup> After knowing the facts about nausea and vomiting it needs to observe as variable in those cases that have been done in monitored anaesthesia care or deep sedation. In our institution major amount of gastrointestinal endoscopies are done in Monitored Anaesthesia Care (MAC) therefore we have exclusively tried to find out association of nausea and vomiting in this regard.

Sedation during endoscopic procedures has long been carried out with benzodiazepine and other hypnotic agents. Recently, multiple studies have been published on the use of Propofol.<sup>11-18</sup> A previous study shows almost 25% of endoscopies are performed using propofol-based deep sedation.<sup>19</sup> In a recent study, propofol was compared with midazolam in endoscopies, as far as sedation and early recovery propofol is more effective as compare to midazolam.<sup>20</sup> Propofol also has an additional advantage on its antiemetic property,<sup>21</sup> so propofol is the preferred choice for induction or sedation whenever nausea vomiting is concerned. In our institution, Propofol, ketamine and benzodiazepine are used for sedation. Propofol was a preferred choice, 84.6% of patients sedated by propofol.

Certainly, we have also look at some other risk factors associated with predictive of both nausea and vomiting such as (female gender, nonsmoking status, and general anesthesia). There was a clear relationship between nausea and vomiting. In previous study, the overall incidence rate for nausea and vomiting was 19%, and 10% respectively. Approximately half of the patients with nausea suffered also from vomiting.<sup>22</sup> Nausea and vomiting are significantly associated with the presence of diabetic complications, particularly autonomic and peripheral neuropathy. Patients are presented with gastroesophageal reflux 19 %, dyspepsia 14 %, and gastropresis 20-40%. Poor glycemic control was an independent risk factor for upper gastrointestinal symptoms.<sup>22-24</sup> In our

audit we observed 13 % diabetic patients have nausea and vomiting. Nausea and vomiting itself one of complication after endoscopy but we did not find any relation ship in literature with endoscopies under monitored anaesthesia care.

## Conclusion

Incidence of PONV is high after endoscopy under MAC especially in those patients who has high risk factors for PONV as well as in known diabetic patients. Therefore prophylactic antiemetic therapy should be commenced in those patients and further randomized controlled trial should be recommended to establish this relationship.

Knowledge of risk factors which are provoke to trigger nausea and vomiting is essential, and anesthesiologist must aware about potential outcomes. Awareness of PONV predictors would increase anesthesiologists' efforts to reduce the incidence of PONV by selecting patients for antiemetic therapy. In future avoidance of perioperative opioids when possible by substituting drugs which cause less PONV may lead to better gainful and cost effective experience.

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## References

1. Meretoja OA, Taivainen T, Raiha L, Korpela R, Wirtavuori K. Sevoflurane–nitrous oxide for paediatric bronchoscopy and gastroscopy. *Br J Anaest.* 1996;76:767–771.
2. Montes RG, Bohn RA. Deep sedation with inhaled sevoflurane for pediatric outpatient gastrointestinal endoscopy. *J Pediatric Gastroenterol Nutr.* 2000;31:41–46.
3. Disma N, Austuto M, Rizzo G, et al. Propofol sedation with fentanyl or midazolam during oesophagoduodenoscopy in children. *Eur J Anaesthesiol.* 2005;22:848–852.
4. Sinclair DR, Chung F, Mezei G. Can postoperative nausea and vomiting be predicted? *Anesthesiology*, 1999;91:109-18
5. Acalovschi I. Postoperative nausea and vomiting. *Curr Anaesth Critical Care.* 2002;13:37-43.
6. Watcha MF. Postoperative nausea and emesis. *Anesthesiol Clin North Am.* 2002;20:709-722.
7. Odom-Forren J, Moser DK. Post discharge nausea and vomiting: a review of current literature. *J Ambulatory Surg.* 2005;12:99-105.
8. Apfel CC, Korttila K, Abdalla M, et al. A factorial trial of six interventions for the prevention of postoperative nausea and vomiting. *N Engl J Med.* 2004;350:2441-2451.

9. Kovac AL. Prevention and treatment of postoperative nausea and vomiting. *Drugs*. 2000;59:213-243.
10. Apfel CC, Laara E, Koivuranta M, et al. A simplified risk score for predicting postoperative nausea and vomiting. *Anesthesiology*. 1999;91:693-700.
11. Sipe BW, Rex DK, Latinovich D, et al. Propofol versus midazolam/meperidine for outpatient colonoscopy: administration by nurses supervised by endoscopists. *Gastrointest Endosc*. 2002;55:815- 825.
12. Thohda G, Higashi S, Wakahara S, Morikawa M, Sakumoto H, Kane T. Propofol sedation during endoscopic procedures: safe and effective administration by registered nurses supervised by endoscopists. *Endoscopy*. 2006;38:360-367.
13. Sipe BW, Scheidler M, Baluyut A, Wright B. A prospective safety study of a low-dose propofol sedation protocol for colonoscopy. *Clin Gastroenterol Hepatol*. 2007;5:563-566.
14. McQuaid KR, Laine L. A systematic review and meta-analysis of randomized, controlled trials of moderate sedation for routine endoscopic procedures. *Gastrointest Endosc*. 2008;67:910-923.
15. Horiuchi A, Nakayama Y, Hidaka N, et al. Low-dose propofol sedation for diagnostic esophagogastroduodenoscopy: results in 10,662 adults. *Am J Gastroenterol*. 2009;104:1650-1655.
16. Traummel JM, Surgenor SD, Gordon SR, et al. Comparison of differing sedation practice for upper endoscopic ultrasound using expert observational analysis of the procedural sedation. *J Patient Saf*. 2009;5:153-159.
17. Jung M, Hofmann C, Kiesslich R, Brackertz A. Improved sedation in diagnostic and therapeutic ERCP: propofol is an alternative to midazolam. *Endoscopy*. 2000;32:233-238.
18. Wehrmann T, Riphaut A. Sedation with propofol for interventional endoscopic procedures: a risk factor analysis. *Scand J Gastroenterol*. 2008;43:368-374.
19. Trummel J. Sedation for gastrointestinal endoscopy: the changing landscape. *Curr Opin Anaesthesiol*. 2007;20:359-64.
20. Yamagata T, Hirasawa D, Fujita N, et al. Efficacy of propofol sedation for endoscopic submucosal dissection (ESD): assessment with prospective data collection. *Intern Med*. 2011;50(14):1455-60.
21. Borgeat A, Wilder-Smith OH, Saiah M, et al. Subhypnotic doses of propofol possess direct antiemetic properties, *Anesth Analg*. 1992;74:539-41.

22. Koivuranta M, Läärä E, Snare L, et al. A survey of postoperative nausea and vomiting. *Anaesthesia*. 1997;52:443–9.
23. Parkman HP, Hasler WL, Fisher RS. American Gastroenterological Association. American Gastroenterological Association technical review on the diagnosis and treatment of gastroparesis. *Gastroenterology*. 2004;127:1592.
24. Parkman HP, Hasler WL, Fisher RS. American Gastroenterological Association. American Gastroenterological Association medical position statement: diagnosis and treatment of gastroparesis. *Gastroenterology*. 2004;127:1589.