

### Comment on “A Comparison of the Effects of Droperidol and the Combination of Droperidol and Ondansetron on Postoperative Nausea and Vomiting for Patients Undergoing Laparoscopic Cholecystectomy”

To the Editor:

The randomized study<sup>1</sup> to test whether addition of ondansetron to droperidol reduces postoperative nausea and vomiting after laparoscopic cholecystectomy, recruited only 64 patients and was thus severely underpowered. At a 95% confidence, the study had only 10% power to detect the difference in vomiting of 30% versus 19% (the actual difference found), and only a 20% power to detect the difference in nausea (70% vs. 53%).

Therefore, the probability that the study has missed the real benefit of ondansetron in reducing postoperative nausea and vomiting is 90% and 80%, respectively. This study could still be salvaged and published when it is sufficiently powered. To detect the observed difference in nausea with a 80% power and 95% confidence,<sup>2</sup> the study would need 139 patients in each arm; for vomiting, this number should be 257 patients in each arm.

**Jayant S. Vaidya, MBBS, MS, DNB, FRCS, PhD**  
Department of Surgery  
Middlesex and Whittington Hospitals  
Royal Free and University College London  
Medical School  
London, United Kingdom

### References

1. Awad IT, Murphy D, Stack D, Swanton BJ, Meeke RI, Shorten GD: A comparison of the effects of droperidol and the combination of droperidol and ondansetron on postoperative nausea and vomiting for patients undergoing laparoscopic cholecystectomy. *J Clin Anesth* 2002;14:481–5.
2. *Software Used to Calculate Power: Statcalc (part of Epi Info Version 6.0)*. Atlanta, GA: Centers for Disease Control.

doi:10.1016/j.jclinane.2003.01.005

### Detection of Flatus Using a Portable Hydrogen Gas Analyzer

To the Editor:

Detecting the passage of flatus is important when treating postoperative patients because it shows recovery of bowel function. Flatus detected using a carbon dioxide (CO<sub>2</sub>) analyzer is sensitive and accurate.<sup>1</sup> Hydrogen (H<sub>2</sub>), like CO<sub>2</sub>, is always in flatus<sup>2</sup> and for that reason the first one can also be used as an indicator of flatus. The objective of

the study was to compare the H<sub>2</sub> analyzer with the CO<sub>2</sub> analyzer as a flatus monitor.

The flatus monitor used in this study is both a CO<sub>2</sub> and a H<sub>2</sub> analyzer. The CO<sub>2</sub> analyzer (Model testo950, Testo Co., Ltd., Yokohama, Japan) is based on the nondispersion infrared method. The H<sub>2</sub> analyzer has a very small tin oxide semiconductor type H<sub>2</sub> sensor (New Cosmos Electric Co., Ltd., Osaka, Japan).

After institutional approval of the study by the Osaka Railway Hospital of the West Japan Railway Co. and informed consent was obtained from the patients, we studied 20 ASA physical status I and II patients undergoing orthopedic or transurethral surgery. Patients were 68 ± 10 (mean ± SD) years old. Patients fasted from 9 PM the night before surgery, and the surgeries were performed the following afternoon. Spinal anesthesia was performed with tetracaine 8 to 10 mg or dibucaine 6 mg with or without epidural anesthesia. Eight patients with combined spinal and epidural anesthesia were administered 2 mg morphine with or without lidocaine during the operation through an epidural catheter inserted at the L<sub>3</sub>–L<sub>4</sub> interspace. Immediately on the patient's return to the ward, the sampling tube was taped 10 cm from the anus and peripheral gas near the patient's anus was continuously gathered at 500 mL/min using an absorption pump. The analog outputs of both analyzers were input into an analog pen-recorder, and were continuously recorded onto recording paper until 9 AM the following morning. The patient was asked to note the time when he or she was aware of the presence of flatus.

Values are expressed as means ± SD. Linear regression analyses were made by using the StatView-J 5.0 statistical package (SAS Institute Inc., Cary, NC). Results were considered significant when  $p < 0.05$ .

One patient who was administered morphine epidurally passed no flatus for 16.5 hours until the morning after surgery. The following results are for the other 19 patients for whom flatus was recorded: 13.6 ± 5.5 hours was recorded. The number of detections by the CO<sub>2</sub> analyzer was 7.1 ± 6.2 (range 0 to 22) for each patient, with a total of 135 detections; for the H<sub>2</sub> monitor the number of detections was 7.3 ± 6.2 (range 1 to 20) per patient, a total of 139 detections. Eleven of 135 peaks (8%) the anesthesiologist judged as positive with the CO<sub>2</sub> analyzer were thought to be false-positive peaks because there was poor signal-to-noise ratio. At the time of these 11 peaks, neither peaks of deflection on the H<sub>2</sub> analyzer or reports of flatus by the patient were made. Fifteen of the 139 peaks (11%) with the H<sub>2</sub> analyzer were obviously recorded, but the anesthesiologist judged them as negative with the CO<sub>2</sub> analyzer at the time. Patients reported