CONCORDANCE

It is conceivable that the consequences of pneumoperitoneum could differ in humans and sheep. In contrast to the recommendation of Cruz et al., Steinbrook et al.11 used ETCO2 (32–36 mmHg) to guide ventilation during laparoscopic operations in pregnant women (9–30 weeks gestation). In that study, there were no untoward effects on the mother or baby.11 Thus, we believe that conclusions on the utility of capnography in pregnant patients undergoing laparoscopy should await appropriate clinical investigation, which include simultaneous measurements of PaCO2 and PETCO2.

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References


In Reply — We appreciate the opportunity to respond to the letters by Steinbrook et al. and Shankar et al.

Answering the letter by Steinbrook et al., case reports1–7 of laparoscopic procedures during pregnancy with good outcomes were published previously to our study. Also, papers warning against the indiscriminate use of CO2 pneumoperitoneum appeared in the literature.8 It was the lack of controlled prospective studies that prompted our prospective experimental study.9

In our animal model, we demonstrated a large and variable PaCO2-ETCO2 gradient using direct measurement methods, whereas Steinbrook et al. did not attempt to directly evaluate the adequacy of ventilation during their procedures. It has been shown that the use of ETCO2 to monitor ventilation in this group of patients might be inaccurate leading potentially to the development of respiratory acidosis.10–11 Based on their study design and number of patients, we believe that no conclusions can be made from it to recommend against the necessity of using arterial blood gas sampling to monitor the adequacy of ventilation during laparoscopic procedures in third-trimester pregnant patients.

In response to the interesting letter by Shankar et al., we agree that it would be an ideal situation to assume a constant 10 mmHg difference in PaCO2 to ETCO2 gradient values between insufflated and noninsufflated gravid patients. Unfortunately, we obtained PaCO2 to ETCO2 gradients in the range of 10–16 mmHg with ETCO2 values in the range of 23–30 mmHg. This large range of values would prevent us from assuming a constant 10 mmHg gradient difference, which may lead to hypo- or hyperventilating the patient. This fact supports our recommendation of using arterial blood gas sampling to accurately monitor adequate ventilation in this group of patients.

The work by Shankar et al.12–11 merits recognition as they provide an interesting piece of information regarding cardiovascular physiology of late pregnancy and in the early postpartum period in anesthetized patients. However, there are physiologic differences when CO2 pneumoperitoneum is induced, and therefore Shankar et al’s results are difficult to apply to our study.

With reference to the second point, in our study, ventilation was controlled as necessary to maintain maternal normocarbia by increasing tidal volume. Changes in respiratory rate were not significantly different between study groups, and we did not observe zero or negative PaCO2 to ETCO2 differences, which could indicate a large mismatch of ventilation-perfusion. In addition, we do not know the extent of CO2 absorbed from the peritoneal cavity and its contribution to ETCO2 measurement. Despite that, the PaCO2 to ETCO2 difference remained significantly larger in the insufflated group. It is our impression that the magnitude of arterial CO2 changes are great

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enough to raise a concern regarding the use of noninvasive methods to monitor ventilation.

We cannot answer precisely what happens in the alveoli during ventilation of patients undergoing intra-abdominal CO₂ insufflation, but the results of our study strongly suggest a large and unpredictable difference between PaCO₂ and end-tidal CO₂ values, thereby our recommendation of monitoring PaCO₂ by direct methods.

Addressing the third point, despite the disadvantages of using animal models with regards to their applicability to humans, they help us to understand and to obtain vistas and ideas of the mechanisms of biological operation. Naturally, results from animal models must always be interpreted with caution in lieu of physiologic differences between species. Nonetheless, the sheep model has been used in obstetric research for decades and has been accepted by the scientific community. However, a well-conducted clinical investigation in humans is still necessary to support our results.

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References


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Lidocaine to Topically Anesthetize the Mucosal Lining of the Airway

To the Editor—Four percent lidocaine is used to topically anesthetize the mucosal lining of the airway. In the process of spraying 4% lidocaine into the mouth and pharynx of approximately 100 very lightly sedated (1 mg intravenous verse; 50 μg intravenous fentanyl) adult volunteers for a research project, approximately 50% of the volunteers spontaneously, and with varying degrees of distress, complained of a bitter taste. In the next 75 volunteers (some of whom were repeat volunteers), the addition of one packet of an artificial sweetener (e.g., Sweet n' Low) to 20 ml of the 4% lidocaine resulted in a neutral to sweet taste that completely eliminated spontaneous complaints of bitterness and resulted in much better acceptance by the volunteers.

The addition of Sweet n' Low to 4% lidocaine will not cause any chemical reactions. Saccharin is an ingredient of viscous lidocaine (but not of liquid 4% lidocaine) and does not react with lidocaine (Dr. Philip Anderson, Pharmacy Department, UCSD Medical Center, personnel communication). In addition, lidocaine does not react with potassium salts (hydrogen tartrate) or calcium salts (saccharin and silicate),1 which are the only other ingredients in Sweet n' Low. Along this line, I have not observed any suggestion of any precipitation in the mixture of Sweet n' Low and 4% lidocaine.

In summary, the simple safe sweet solution of adding Sweet n' Low to a sometimes troublesome 4% lidocaine bitter problem may be of benefit to other practitioners and awake patients.

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