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1 Schummer W, Schlonski O, Breuer M. Bone cement embolism attached to central venous catheter. *Br J Anaesth* 2014; **112**: 672–4
2 Leggat PA, Smith DR, Kedjarune U. Surgical applications of methyl methacrylate: a review of toxicity. *Arch Environ Occup Health* 2009; **64**: 207–12. doi: 10.1080/19338240903241291
3 Scolnick B, Collins J. Systemic reaction to methylmethacrylate in an operating room nurse. *J Occup Med* 1986; **28**: 196–8

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Respiratory stroke volume variation and fluid responsiveness: how applicable is this?

Editor—I would like to thank Guinot and colleagues[1] for their nicely thought out and conducted study. Their study showed that delta respiratory stroke volume (SV) determined by oesophageal Doppler monitor is a highly sensitive and specific tool (impressive AUROC of 0.92) for predicting fluid responsiveness in pneumoperitoneum. I would like to ask two things about the methodology and applicability of the findings of this study.

It would be interesting to find how much fluid in total these patients had in each group. It was clear from the results table that responders had a significantly lower cardiac output (CO) and SV with approximately the same arterial pressure at baseline. In the absence of hypotension or bleeding, I wonder what the trigger to give volume expansion was. In the very same issue of *BJA*, it has been mentioned that increasing the SV should be judged to be beneficial before volume expansion and not all 'fluid responsive' patients are necessarily hypovolaemic.[2]

Secondly, in this cohort of patients, the average respiratory system compliance (which I calculated as V_t divided by the plateau pressure minus the PEEP) was about 84, something we hardly ever see in anaesthesia for laparoscopic surgery. We well know that pneumoperitoneum significantly affects lung compliance (up to 50% reduction during pneumoperitoneum).[3] This will further reduce with time as the ventilation demand increases by 10–25% to manage the hypercapnoea. Again in the *BJA*, we learnt how the validity of dynamic variables used to assess volume responsiveness becomes questionable when certain criteria are not met.[4] One of the factors that significantly affects such validity is pulmonary system compliance. This will make me slightly sceptical about the applicability of these results in everyday practice.

Declaration of interest

None declared.

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1 Guinot P-G, de Broca B, Bernard E, Abou Arab O, Lorne E, Dupont H. Respiratory stroke volume variation assessed by oesophageal Doppler monitoring predicts fluid responsiveness during laparoscopy. *Br J Anaesth* 2014; **112**: 660–4
2 Marik PE, Lemson J. Fluid responsiveness: an evolution of our understanding. *Br J Anaesth* 2014; **112**: 617–20
3 Rauh R, Hemmerling TM, Rist M, *et al.* Influence of pneumoperitoneum and patient positioning on respiratory system compliance. *J Clin Anesth* 2001; **13**: 361–5
4 Mahjoub Y, Lejeune V, Muller L, *et al.* Evaluation of pulse pressure variation validity criteria in critically ill patients: a prospective observational multicentre point-prevalence study. *Br J Anaesth* 2014; **112**: 681–5

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Reply from the authors

Editor—We would like to thank Dr Bahlool for his comments. We constructed the study[1] to investigate the ability of respiratory variation of stroke volume (SV) to predict fluid responsiveness. For this purpose, we included patients for whom the physician had decided to infuse fluid. The reasons for fluid infusion were cardiac output (CO) optimization, haemorrhage, and arterial hypotension. In the case of CO optimization, fluid was infused when SV decrease was more than 10%. Unfortunately, we included the first fluid infusion and did not record the total of fluid infused during the surgery.

We agree with the fact that fluid responsiveness is not synonymous with hypovolaemia. However, we believe that laparoscopy is a specific haemodynamic setting for which assessment of preload responsiveness may help the physician in the case of heart rate or arterial pressure changes. In this way, our objective was to test respiratory variation of SV as an indicator of fluid responsiveness.

We agree with the fact that a high respiratory compliance may decrease the ability of respiratory derivate indicators.[2] However, we calculated the average respiratory compliance that was 35 (8) ml cm H_2O^{-1}. Equally, the mean respiratory compliance calculated from our data (mean tidal volume, pressure plateau, PEEP) was about 37 ml cm H_2O^{-1}. These values are close to those observed in the operating theatre or intensive care unit, in which dynamic preload indicators have been demonstrated to predict fluid responsiveness.[3 4]

Declaration of interest

None declared.

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