

**Dynamic variables of fluid responsiveness during pneumoperitoneum and laparoscopic surgery.**  
Høiseth L.O., Hoff I.E., Myre K., Landsverk S.A., Kirkebøen K.A. *Acta Anaesthesiol Scand.* 2012  
Jul;56(6):777-86.

### **Background**

Few data exist on dynamic variables predicting fluid responsiveness during laparoscopic surgery. The aim of this study was to explore the effects of laparoscopy on four dynamic variables: respiratory variations in pulse pressure ( $\Delta$ PP), stroke volume variation by Vigileo/FloTrac (SVV (Vigileo)), pleth variability index (PVI) and respiratory variations in pulse oximetry plethysmography waveform amplitude ( $\Delta$ POP), and their relation to fluid challenges during laparoscopic surgery.

### **Methods**

$\Delta$ PP, SVV (Vigileo), PVI and  $\Delta$ POP were studied in 20 adult patients before and during pneumoperitoneum (10-12 mmHg). During ongoing laparoscopic surgery, relations between the dynamic variables and changes in stroke volume oesophageal Doppler, (SV(OD) ) after fluid challenges (250 ml colloid) were evaluated.

### **Results**

Pneumoperitoneum changed the dynamic variables as follows {mean [95% confidence interval (CI)]}:  $\Delta$ PP 0.5 (-1.3, 2.3)%,  $P = 0.53$ ; SVV (Vigileo) 0.6 (-1.3, 2.5)%,  $P = 0.52$ ; PVI 2.9 (0.4, 5.3)%,  $P = 0.025$ . For  $\Delta$ POP, median difference (95% CI) was 2.5 (-0.15, 6.7)%,  $P = 0.058$ . During laparoscopic surgery, areas under receiver operating characteristics curves (95% CI) were  $\Delta$ PP 0.53 (0.31-0.75), SVV (Vigileo) 0.74 (0.51-0.90), PVI 0.61 (0.38-0.81),  $\Delta$ POP 0.63 (0.40-0.82). Correlation coefficients (P-values) between changes in dynamic variables and changes in SV(OD) were  $\Delta$ PP  $r = -0.65$ ,  $P = 0.009$ ; SVV (Vigileo)  $r = -0.73$ ,  $P = 0.002$ ; PVI  $r = -0.22$ ,  $P = 0.44$ ;  $\Delta$ POP  $r = -0.32$ ,  $P = 0.24$ .

### **Conclusion**

$\Delta$ PP and SVV (Vigileo) did not change as pneumoperitoneum was established, whereas PVI increased and  $\Delta$ POP tended to increase. All four dynamic variables predicted fluid responsiveness relatively poor during ongoing laparoscopic surgery.  $\Delta$ PP and SVV (Vigileo) tracked changes in stroke volume induced by fluid challenges during ongoing laparoscopic surgery, whereas  $\Delta$ POP and PVI did not.