



An Observational Study Comparing Intrathoracic Pressure Changes and Stroke Volume Variation with Abdominal Insufflation

Esophageal pressure and Stroke Volume Variation

Sadaf Sadjadi, B.A., Omar Alzayat, B.A., Chaitra Subramanyam, M.S., Neal Fleming, M.D., Ph.D.

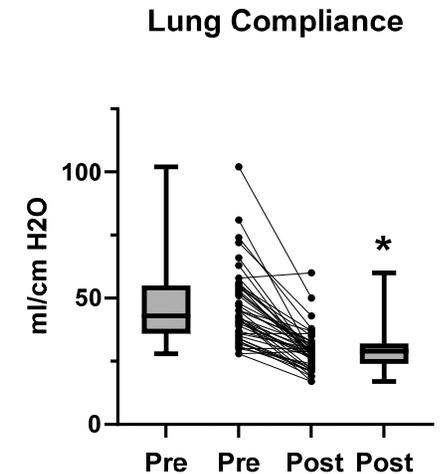
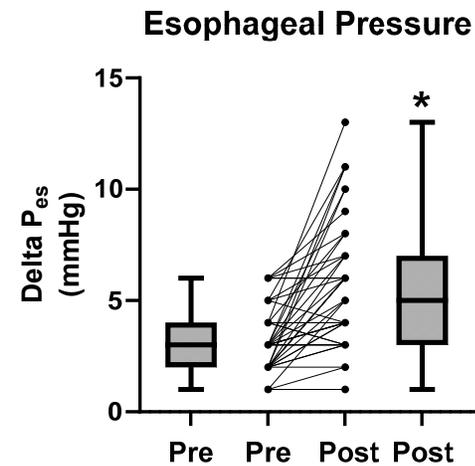
Introduction and Methods

- Stroke volume variation (SVV) is a predictor for fluid responsiveness in mechanically ventilated patients.
- Esophageal pressure (Pes) is can be used to measure intrathoracic pressure changes.
- The literature regarding the changes in SVV with pneumoperitoneum is sparse and conflicting.
- The objective of this study was to observe the impact of insufflation on SVV, Pes and other pulmonary and hemodynamic measurements.

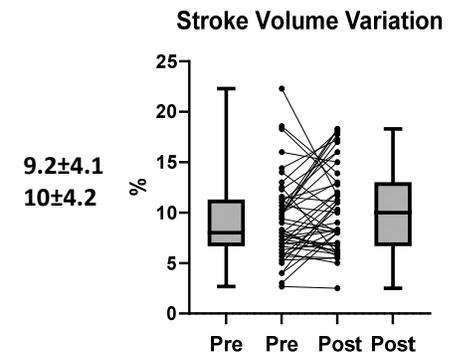
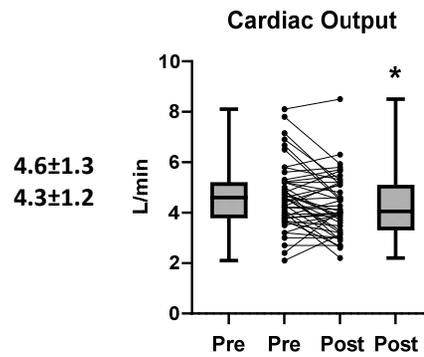
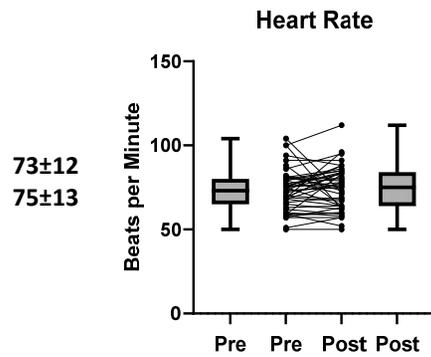
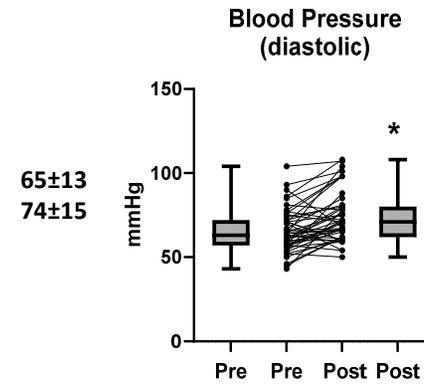
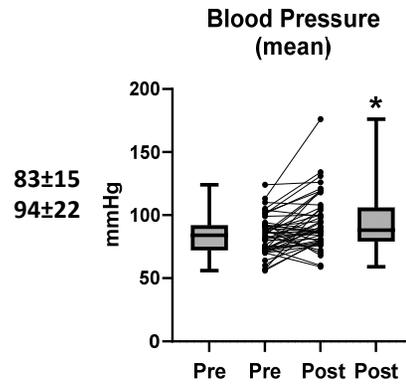
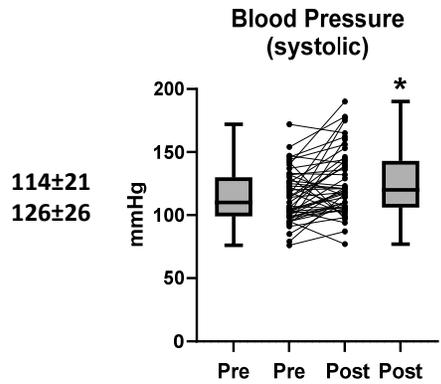
- The Human Subjects Research Committee approved a single-site, non-randomized, observational study.
- Adult ASA I-III patients undergoing elective laparoscopic surgery provided written, informed consent.
- The Edwards HemoSphere monitor was used to measure SVV and other hemodynamic variables. An esophageal balloon catheter was inserted after induction to measure Pes.
- Pre and Post-insufflation measurements included: SVV, blood pressure, cardiac output, Δ Pes and lung compliance,
- Wilcoxon test was used to compare all variables.

Results

- Data was collected from 100 patients
47 had Tidal Volume 7-9 mL/kg (IBW).
- 38 were female, 8 were male, 1 identified as non-binary.
- Age: 52 ± 18
Height 165.9 ± 8.2 cm
Weight 84.2 ± 20.4 kg
Ideal body weight 58.8 ± 8.1 kg
- Following insufflation:
 - No significant Changes in Respiratory Rate or Tidal Volume
 - ΔP_{es} increased from 3.1 ± 1.5 to 5.5 ± 2.9 mmHg
 - Lung Compliance decreased from 47 ± 15 to 29 ± 8 ml/cmH₂O



Results Continued



Conclusion

- This observational study explored the relationships between pneumoperitoneum, esophageal pressure, lung compliance and hemodynamics.
- Insufflation was associated with a significant increase in esophageal pressure and a decrease in lung compliance. There were slight increases on BP and decreases in CO but no consistent changes in SVV.
- Future research should explore the impact of abdominal insufflation and other positional changes on esophageal pressure and the performance of stroke volume variation as a predictor for fluid responsiveness .