A655 - Impact of a stepwise increase in pEEP (peeptrial) on haemodynamics, static compliance, functional residual capacity and tidal volume: a study in patients with picco-monitoring.

W Huber 1; J Wettstein 2; S Rasch 2; T Lahmer 2; A Herner 2; M Heilmaier 2; G Batres-Baires 2; R Schmid 2; U Mayr 2

1Klinikum rechts der Isar, II. Medizinische Klinik; Station 2/11, Munich, Germany, 2Klinikum rechts der Isar, Munich, Germany

Introduction:
Advanced respirator technologies provide automated stepwise PEEP-increases in parallel with measurement of functional residual capacity (FRC) and static pulmonary compliance (C_stat). While this PEEP-Trial (PT) might facilitate optimal PEEP-setting, it also carries the risk of haemodynamic instability due to the reduced venous return. We hypothesized that a standard PT with stepwise increases in PEEP of a total of 8cm H2O might result in substantial haemodynamic changes. Since heart lung interactions have been suggested to diagnose volume responsiveness, the PT could be used as a combined approach to optimize ventilation and haemodynamics.

Methods:
In 28 mechanically ventilated patients (Carescape R860; GE; pressure-controlled ventilation; PF-ratio of 249+83) and PiCCO-monitoring, an automated five step PEEP-trial was performed. PEEP was increased from values 4cmH2O below to 4cmH2O above the preset PEEP-level. PiCCO-data, ventilator settings, FRC and C_stat were measured at baseline and after each increase.

Results:
Mean values for none of the haemodynamic parameters including heart rate, MAP, CVP, global end-diastolic volume index GEDVI, cardiac index, stroke volume variation SVV, extravascular lung water index EVLWI and cardiac power index CPI were significantly different at the end compared to the start of the PT. PEEP (12.2+1.3 vs. 4.4+1.4cmH2O; p<0.001) and FRC (1884+850 vs. 1546+612ml; p<0.001) were significantly higher after the PT, while all other respiratory data including tidal volume and C_stat were not different after the PT. Individual maximum values during the PT were significantly higher for tidal volume (516+126 vs. 467+146mL; p<0.001) and C_stat (50+24 vs. 40+23mL/cmH2O; p<0.001) compared to baseline.

Conclusion:
1.) The PT did not impair haemodynamics. While the PT is haemodynamically safe, its use to detect volume deficiency seems to be low. 2.) Adjustment of PEEP according to the data of the PT substantially improves C_stat and tidal volume.