Heart Rate Variability Remains Unchanged During Conventional Compared to Variable Pressure Support Mechanical Ventilation in Intensive Care Unit Patients

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Argomento: Insufficienza respiratoria acuta e ventilazione meccanica

Goal: To investigate if there is a difference in heart rate variability (HRV) during conventional pressure support compared to variable pressure support mechanical ventilation in intensive care unit (ICU) patients.

Methods: In this cross-over clinical trial, 27 ICU patients were recruited and ventilated for 60 minutes using conventional pressure support and 60 minutes using variable pressure support mechanical ventilation in a randomized fashion (Dräger V-500, Lübeck, Germany). Four patients had to be excluded due to acute necessary changes in respirator settings. At the beginning and end of every measurement, arterial blood gases were taken. All monitor data were recorded using an custom-made HRV monitoring software developed by our institute. Ventilator and cardiopulmonary data, as well as post-hoc calculated HRV data, were compared between conventional and variable pressure support mechanical ventilation.

Results and Discussion: No significant differences in HRV could be detected between conventional and variable pressure support mechanical ventilation. Notably, tidal volumes during variable pressure support compared to conventional pressure support mechanical ventilation remained unchanged. This finding is unexpected but may explain why HRV remained unaltered. Recent investigations showed benefits (e.g. distribution of lung aeration and perfusion) of variable pressure support compared to conventional pressure support mechanical ventilation. However, the underlying mechanisms need to be investigated in more detail.

Conclusion: Monitoring of HRV seems feasible using standard ICU monitoring technology. Preliminary findings of this pilot study assume that respiratory, cardiovascular and HRV data remained unchanged during conventional pressure support compared to variable pressure support mechanical ventilation in ICU patients. This finding needs to be confirmed or rejected in a larger cohort of ICU patients.

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Category: Intensive Care Unit, Mechanical Ventilation, Cardiopulmonary Monitoring, Heart Rate Variability