

Low Tidal Volume Ventilation and Sedation in Acute Respiratory Failure Patients with and without Acute Respiratory Distress Syndrome (ARDS): Findings from the PETAL Network LOTUS-FRUIT Study

Michael S. Aboodi, Jen-Ting (Tina) Chen, Aluko A. Hope, Catherine L. Hough, Michelle Ng Gong, The PETAL Network

Background

- One barrier to implementing low tidal volume ventilation (LTVV) in acute respiratory failure patients with and without Acute Respiratory Distress Syndrome (ARDS) is concern for discomfort leading to increased sedative use.

Aims

- We aimed to determine whether LTVV is associated with level of consciousness and sedative use in ARF patients

Methods

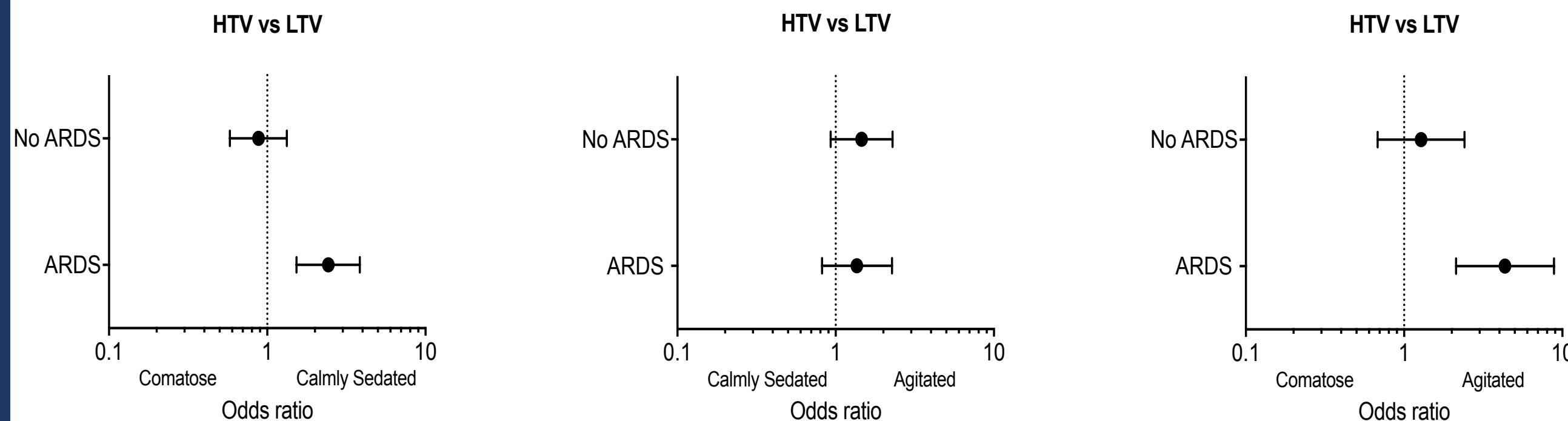
- LOTUS-FRUIT was a prospective 49 center cohort of ARF patients.
- Initial TV after intubation was categorized as LowTV (≤ 6.5 cc/kg), MidTV (6.6-7.9cc/kg) and HighTV (≥ 8 cc/kg).
- Sedative use and consciousness level, categorized as coma based on the Richmond Agitation Sedation-Scale (RASS) with RASS -4 to -5 as coma, RASS -3-0 as calm/lightly sedated and RASS 1-4 as agitated were collected for 3 days after intubation

Results

- The study included 1596 patients enrolled in the LOTUS FRUIT cohort that were initially ventilated with LowTV (N=548, 34%), MidTV (647, 41%), and HighTV (401, 25%).
- LowTV was more frequently used in ARDS (50% LowTV vs 43% MidTV and 43% HighTV; $p=0.03$) and with more severe ARDS (9% in mild vs 48% in moderate and 43% in severe ARDS; $p=0.02$)

Figure 1

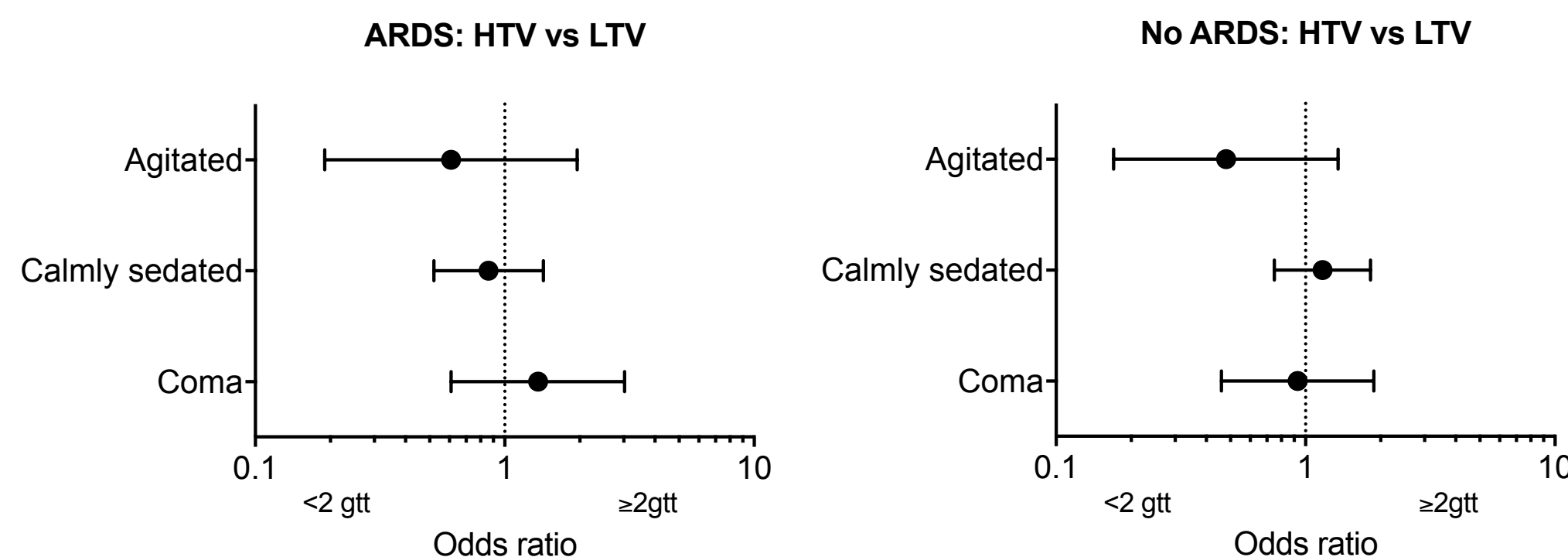
Higher TV is associated with less coma - only in ARDS patients



HTV- High Tidal Volume, LTV- Low Tidal Volume

Figure 2

Tidal volume does not affect sedative medication needs



HTV- High Tidal Volume, LTV- Low Tidal Volume, gtt- continuous drip medications

Results (continued)

- In ARDS patients (725, 45%), HighTV were more likely to be calmly sedated than comatose as compared to LowTV (OR 2.43, 95% CI 1.53-3.85; $p<0.0001$).
- In non-ARDS patients, tidal volume was not associated with level of consciousness achieved.
- For both ARDS and non-ARDS patients, tidal volume was not significantly associated with number of continuous sedative medications used.

Conclusions

- Among patients with ARDS, for whom the beneficial effects of LTVV has been more clearly demonstrated, LowTV is associated with more coma.
- Among patients without ARDS, there is no increased risk of coma or agitation with LowTV.
- Tidal volume is not significantly associated with sedative medication needs

Strengths and Limitations

Strengths:

- Longitudinal analysis- Not using a single point in time. Accounts for differences between sites and repeated measures.
- Lotus Fruit is a strong cohort- large number of patients, many sites, over multiple days
- Level of sedation achieved is a component of analysis

Limitations:

- Does not take into account actual doses of medication

Acknowledgements

Supported by NIH/National Center for Advancing Translational Science (NCATS) Einstein-Montefiore CTSA Grant Number UL1TR001073



Montefiore