



ISPCOP Symposium 2016

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Non-Invasive Assessment of Low Minute Ventilation in the PACU and General Hospital Floor

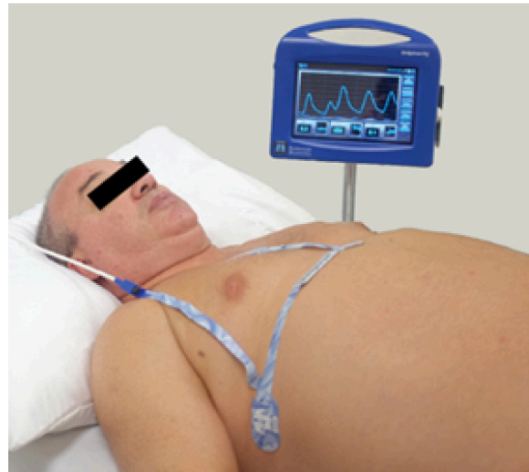
Bonney I¹, Brayonov J², Dean S³, Zahedi F¹, Schumann R¹. Dpt. of Anesthesiology & Perioperative Medicine

Tufts Medical Center¹, Respiratory Motion Inc., Waltham, MA, USA², Tufts University School of Medicine, Boston, MA, USA³



Disclosures

- Disposables for the study were provided by Respiratory Motion Inc., Waltham, MA, USA



Background

- Most feasible postoperative respiratory monitoring not yet determined
- Patients with high (>5) STOP-Bang score are at risk for OSA and ? Postop opioid induced respiratory depression
- A new non-invasive respiratory volume monitor (RVM) can accurately assess tidal volume (TV) , respiratory rate (RR) and minute ventilation (MV) in spontaneous respiration
- We studied the incidence of low MV episodes in patients with a high (≥ 5) vs low (< 5) SB score in PACU and the general hospital floor
- Also determined the role of RR in the detection of low MV.

Methods

- IRB approval and informed consent
- RVM monitoring in 35 general surgical patients
- MV is expressed as % predicted
- Low MV events (LMVe) = $MV < 40\%$ predicted for ≥ 2 min
- Mean time between LMcve (MTBe) = duration of monitoring (hrs) divided by number of events
- Mean LMcve duration = duration of alarming divided by number of events
- T – test or χ^2 for analysis

Results

Demographics

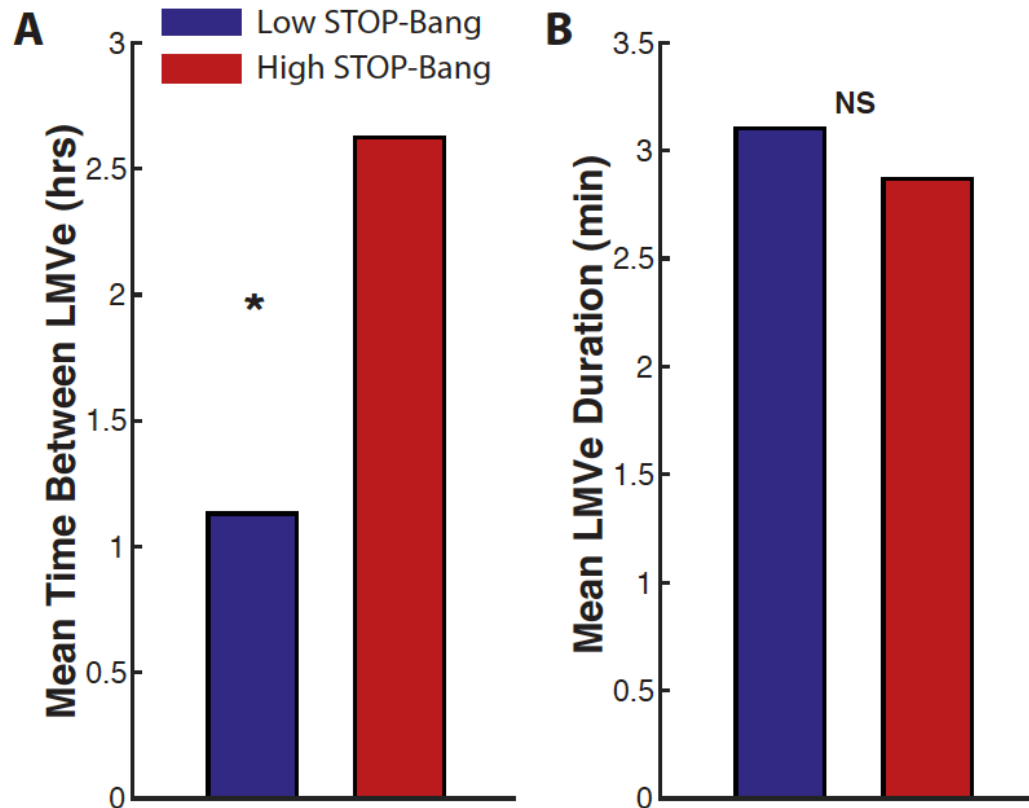
Group	Low SB	High SB	P-value
	SB < 5	SB ≥ 5	
OSA Risk	Low	Moderate/Severe	
Number of Patients	24	11	
STOP-BANG (SD)	2.2 (1.5)	5.4 (0.7)	< 0.0001
Height, cm (SD)	163 (10)	166 (9)	0.43
Weight, kg (SD)	80 (16)	106 (26)	0.0006
BMI, kg/m ² (SD)	30.0 (6.1)	38.5 (9.0)	0.002
Length of Monitoring, hr, (SD)	18.9 (2.4)	17.1 (2.4)	0.045
Average Percent MV _{PRED} (SEM)	87.1 (6.7)	94.3 (14.5)	0.61
Mean Time Between LMVe, hr	1.1	2.6	< 0.0001
Mean LMVe Duration (min)	5.8	4.0	0.37

Table 1. Demographics and Low Minute Ventilation event characteristics for Low SB patients considered not-at-risk for OSA and High SB patients considered at-risk for OSA.

Results

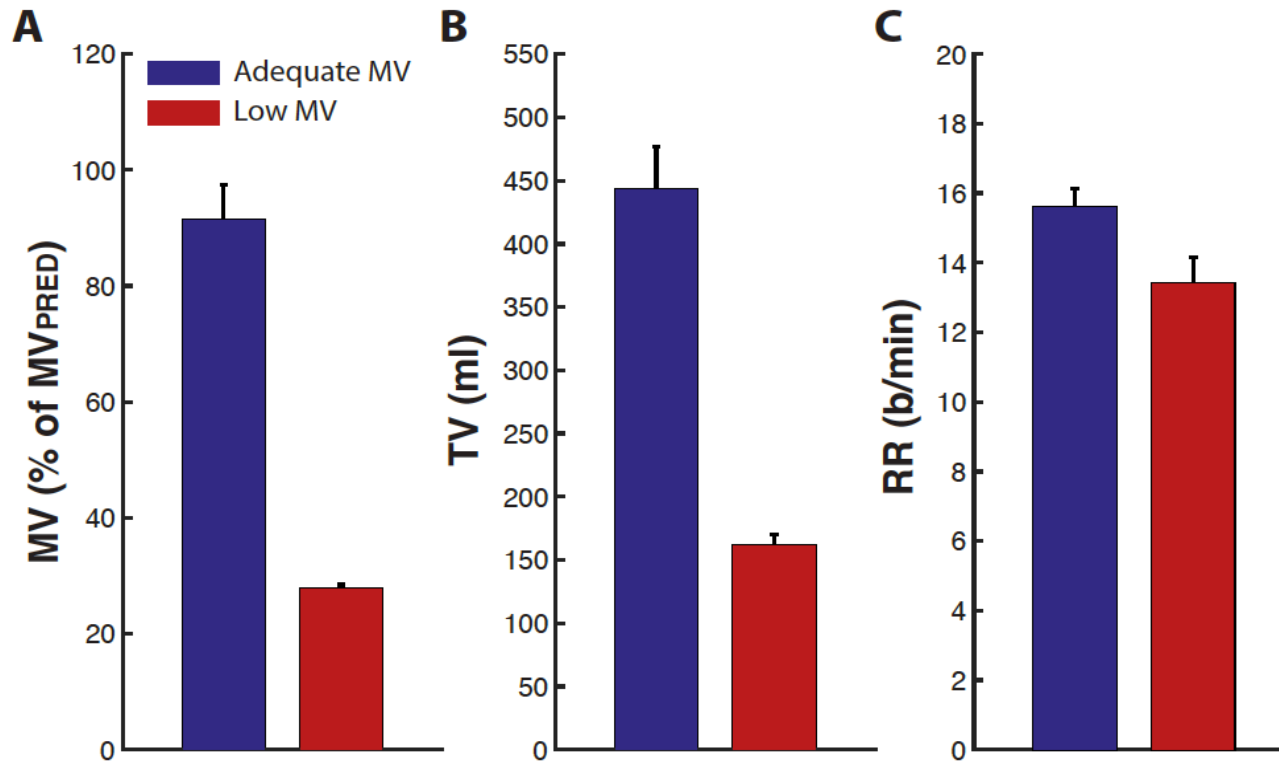
- Monitored for 18.4 ± 2.5 hrs,
 - PACU: 4.4 ± 2.7
 - Floor: 14 ± 3.3
- No LMVe in 10 patients, 86 % of all monitored hours were free of LMVe
- Similar incidence of LMVe in PACU vs floor observation (MTBe 1.2 vs 1.4 hours)
- During LMVe, MV decreased from 91 % pred to 27 % pred mostly based on a 63 % decrease in TV (14 % decrease in RR)

Results



- MTBe is significantly longer ($p = 0.0001$) in High SB Patients
- The LMVe duration was Similar between groups

Results



Minute ventilation, tidal volume and respiratory rate during periods of adequate (blue) and low (red) minute ventilation. $p = < 0.05$ for all comparisons

Conclusion

- In this small pilot study of a general surgical population, LMVe are infrequent, 86% of monitored hours were free of events.
- Patients with a high SB score had a less frequent LMV events (significant) and shorter LMV events (trend) compared to low SB score patients
- LMV events had clinically significant decreases in TV and only a modest decrease in RR
- Larger scale study to confirm the findings is needed
- The Exspiron RVM may be an excellent option for selected patients at risk for postoperative respiratory depression as part of an algorithmic monitoring care pathway

Thank You !

More information:

- ISPCOP: International Society for the Perioperative Care of Obese Patients
 - <http://www.ispcop.org>