INDIVIDUALIZED LUNG RECRUITMENT MANEUVER GUIDE BY PULSE-OXIMETRY IN ANESTHETIZED NON-OBESE PATIENTS UNDERGOING.

Villena A., , Jurado A., Carrizo J., Duca A., Soro M., Ferrando C.
Department of Anesthesiology and Intensive Care, Hospital Clínico Universitario de Valencia, Spain.

BACKGROUND AND GOAL OF STUDY

General anesthesia and mechanical ventilation promote atelectasis which negatively affects the lung function¹ and may promote postoperative pulmonary complications. The open-lung approach (OLA) is aimed at restoring the functional lung volume². In a recent study, the SpO₂ under low FIO₂ was useful to monitor the lung's opening and closing pressure in morbidly obese anesthetized patients³.

- Our goal was to test whether SpO₂ can personalize the implementation of an open-lung approach during laparoscopy.

MATERIALS AND METHODS

- 30 patients with SpO₂ ≥97% on room-air before anesthesia were studied.
- After anesthesia induction and capnoperitoneum the FIO₂ was reduced to 0.21.
- Those patients whose SpO₂ decreased below 97% complete the following phases: 1) First recruitment maneuver (RM), until reaching lung's opening pressure, defined as the inspiratory pressure level yielding a SpO₂ ≥97%; 2) a PEEP titration trial until reaching lung's closing pressure defined as the PEEP level yielding a SpO₂ <97%; 3) a second RM was performed and, 4) ongoing ventilation with PEEP adjusted above the detected closing pressure.

RESULTS AND DISCUSSION

- Breathing air, 24 of 30 patients (80%) showed SpO₂ <97% together PaO₂/FIO₂ <400mmHg.
- The mean opening pressures were found at 40(6) and 33(4) cmH₂O during the first and second RM, respectively.
- The closing pressure was 11(5) cmH₂O. This SpO₂-guide approach reached an open-lung condition (table 1).
- SpO₂ discriminates the lung's opening and closing pressures with accuracy taking the reference PaO₂/FIO₂ (area under the receiver-operating-curve of 0.88, 95%CI: 0.80 – 0.97).

Variables	Baseline SpO ₂ < 97% (n=24)	Baseline SpO ₂ ≥ 97% (n=6)	p-value 95%CI SpO ₂ < 97% vs SpO ₂ ≥ 97%	Open Lung Condition	p-value 95%CI SpO ₂ < 97% vs Open lung Condition
SpO ₂	92 (2)	97 (1)	<0.001 3.1 – 7.2	98 (1)	<0.001 4.7 – 6.7
PaO ₂ /FIO ₂	228 (91)	398 (11)	<0.001 92 – 247	436 (76)	<0.001 173 – 243
DPtp	18.0 (7.5)	10.1 (3.8)	0.02 1.1 – 14.5	10.0 (3.9)	<0,001 5.3 – 10.4
Cdyn	21 (8)	23 (7)	0.57 -9.6 – 5.4	35 (16)	<0,001 8.1 – 20.4

CONCLUSION

The non-invasive SpO₂ value can easily individualize an open-lung approach.

References:
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3. Tusman G, et al. Noninvasive monitoring of lung recruitment maneuvers in morbidly obese patients: the role of pulse oximetry and volumetric capnography. Anesth Analg 2014; 118:137-44.