Preventing underinflation of the endotracheal tube cuff with a portable elastomeric device. A randomised controlled study

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Introduction:
The management of the endotracheal tube cuff pressure (P_{cuff}) is routine practice for critical care nursing staff. Underinflation could lead to ventilator-associated pneumonia [1] whereas overinflation exposes to tracheal damage[2]. Multi-daily check and adjustment is recommended to ensure that P_{cuff} lies between 20 and 30 cmH_{2}O [3]. To automate this task some devices exist but may be inconvenient, bulky and/or ineffective. Their use is not supported by guidelines. A portable elastomeric device could be appealing for P_{cuff} automated regulation. This prospective randomized controlled study tested whether the Tracoe Smart Cuff Manager™ reduced the rate of patients undergoing ≥1 episode of underinflation (P_{cuff}<20 cmH_{2}O), as compared with routine manual P_{cuff} adjustment.

Methods:
Monocentric, randomized controlled study. Patients with acute brain injury and receiving mechanical ventilation were prospectively allocated to one of the two arms: manual reading and adjustment of P_{cuff} at least every 8h (routine care) or adjunction of the Smart Cuff Manager™ (intervention). This study was approved by an institutional review board.

Results:
Among 60 randomised patients (routine care in 32, Smart Cuff Manager™ in 28), 506 measurements were performed in 48h. With routine care, a higher rate of patients experienced at least one episode of underinflation (62.5 vs. 17.8%; p<0.001). Episodes of underinflation episodes (15% vs. 2%; p<0.001) and manual adjustments (77% vs. 56%; p<0.001) were more frequent with routine care. For overinflation, there was no between-arms difference (p>0.99).

Conclusion:
The adjunction of continuous P_{cuff} control with the Tracoe Smart Cuff Manager™ reduced the incidence of P_{cuff} underinflation as compared with manual intermittent adjustments. Overinflation was not promoted by this device.

References: