Automatic regulation of the endotracheal tube cuff pressure with a portable elastomeric device. A randomised controlled study

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Abstract

Background
Intermittent manual correction of the endotracheal tube cuff pressure ($P_{cuff}$) may delay the detection of underinflation (source of contaminated oropharyngeal content microaspiration) or overinflation (exposing to airway damage). Devices for automated continuous correction of $P_{cuff}$ are appealing but some are inconvenient, expensive or even harmful. This prospective randomised 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 $P_{cuff}$ correction. The rate of patients with ≥ 1 overinflation episode ($P_{cuff} > 30$ cmH$_2$O) and the incidence of under/overinflation were also compared.

Methods

Patients with acute brain injury and likely to receive invasive mechanical ventilation for > 48 h were randomly allocated to receive, during 48 h, automated $P_{cuff}$ correction (combined with manual correction) or manual correction alone. $P_{cuff}$ was measured with a dedicated manual manometer, at least every 8 h.

Results

Sixty patients were included and randomised (32 patients with manual and 28 with automated $P_{cuff}$ correction) for 506 measurements of $P_{cuff}$ (269 and 237, respectively). Automated correction of $P_{cuff}$ was associated with a lower rate of patients with ≥ 1 episode of underinflation (63% and 18%, respectively, $P < 0.001$), a lower incidence of underinflation episodes (15% vs. 2%; $P < 0.001$), a lower rate of manual corrections (77% vs. 58%; $P < 0.001$). For overinflation, there were no significant between-groups differences (2% vs. 2%). The incidence of early respiratory infections was similar in both groups (29% vs. 25%, $P = 0.78$).
Conclusions

The adjunction of continuous $P_{cuff}$ control with the Tracoe Smart Cuff Manager™ to routine manual intermittent correction reduced the incidence of $P_{cuff}$ underinflation episodes without provoking overinflation.

Trial Registration


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