

Continuous Cuff Pressure Control in Preventing Ventilator-Associated Pneumonia



Patients in the ICU often require invasive mechanical ventilation support. This requires tracheal intubation, where an endotracheal cuff wrapped around the tip of the tube seals the extraluminal airway for positive pressure ventilation. Inappropriate cuff pressure control can contribute to ventilator-associated complications. Studies report that approximately 10–20% of long-term (≥ 48 hr) ventilated ICU patients will develop an episode of ventilator-associated pneumonia (VAP).

VAP prevention is thus an important field of research. Strategies such as decontamination of the oral cavity and subglottic secretion drainage are considered effective in VAP prevention. The main pathogenic mechanism for VAP is the microaspiration of subglottic secretions. To provide an optimal seal of the extraluminal airway, adequate inflation of the endotracheal cuff is required. But cuff pressure tends to fluctuate due to patient or tube movements. This can induce microaspiration. Over the years, several devices for continuous cuff pressure control (CCPC) have been developed.

A recent review assessed the effectiveness of CCPC in VAP prevention. Eleven randomised controlled trials (RCTs) with 2092 adult intubated patients were evaluated that compared the impact of CCPC versus intermittent cuff pressure control on the occurrence of VAP. The meta-analysis calculated the odds ratio (OR) and 95% CI for VAP incidence between groups. The secondary outcomes of the review were mortality, duration of mechanical ventilation and ICU stay.

As per the findings of the analysis, the use of CCPC was associated with a reduced risk of VAP. Meta-analyses of secondary endpoints showed no significant difference in mortality. However, significant differences were observed in the duration of mechanical ventilation and ICU stay in favour of CCPC.

Overall, these findings show that the use of CCPC is associated with a reduction in VAP incidence. However, the certainty of this evidence is low due to concerns related to bias and inconsistency with this analysis. Therefore, there is a need for high-quality research in this area to further evaluate the effectiveness of CCPC for VAP prevention.

Source: [Critical Care](#)

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Published on : Tue, 20 Sep 2022