

timepoints, of which several were directly correlated to the progression into hypoxemia. PLS-DA modeling predicted postoperative hypoxemia at 72 h with 72.2 % sensitivity and 81.0 % specificity based on blood samples collected just before CPB, while PLS models revealed a correlation of r^2 equal to 0.7. Higher predictive values (>88 % sensitivity, >92 % specificity, and $r^2 > 0.91$) were achieved when analyzing blood collected 0, 2, 4, 8, and 20 h postoperatively, demonstrating the ability of metabonomics in early diagnosis.

Conclusion: We found that metabonomics may contribute to the detection of early signs of pulmonary dysfunction two-three days before significant postoperative hypoxemia. The study provides novel insights into the underlying mechanisms that trigger progression into hypoxemia, facilitating new hypotheses and treatment options.

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Multicenter randomized clinical trial of lateral-trendelenburg vs. semi-recumbent position for the prevention of ventilator-associated pneumonia - the gravity-VAP trial

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Introduction: Gravity plays a pivotal role in the pathogenesis of ventilator-associated pneumonia (VAP) (1). In previous laboratory studies (2) the semi-lateral Trendelenburg position (LTP) hindered gravity-driven pulmonary aspiration and avoided VAP.

Objectives: To determine whether the LTP vs. the semi-recumbent position (SRP) would reduce the incidence of microbiologically confirmed VAP and to appraise patient's compliance and safety.

Methods: We conducted a randomized, single-blind, controlled study in 17 European centers and 1 in North America. A total of 2019 adult patients were screened between 2010 and 2015. 395 patients were randomized - 194 in LTP and 201 in SRP - and analyzed in an intention to treat approach. Patients in LTP were placed in semi-lateral (60°) - Trendelenburg position to achieve an orientation, from the sternal notch toward the mouth, slightly below horizontal, and turned from one side to the other every 6 hours. LTP was encouraged during the first days of mechanical ventilation, but always in compliance with the patient's wish. In the SRP group, the head of the bed was elevated $\geq 30^\circ$. Primary outcome was VAP incidence rate, based on quantitative bronchoalveolar lavage fluid culture with $\geq 10^4$ colony-forming units/mL. Secondary outcomes were compliance to the randomized position, length of intubation, duration of intensive care unit and hospital stay, mortality, and adverse events.

Results: The trial was stopped after the planned interim analysis for achieving efficacy endpoints and owing to safety concerns. Patients

in the LTP and SRP group were kept in the randomized position for 38 % and 90 % of the study time, respectively ($p = 0.001$). Yet, during the first 48 hours, LTP patients were kept in the randomized position for 50 % of the study time, and SRP patients for 88 % ($p = 0.001$). In the LTP, the bed was angulated 5.6° in Trendelenburg; while, the head of the bed was elevated 34.1° in the SRP group. Incidence rates of microbiologically confirmed VAP were 0.88 (1/1136 patient-days; 95 % confidence interval [CI], 0.12-6.25) in the LTP group, and 7.19 (8/1113 patient-days; CI 95 %, 3.60-14.37) in the SRP ($p = 0.020$), relative risk reduction of 0.12 (95 % CI, 0.01-0.91). No statistically significant differences were observed in durations of mechanical ventilation, intensive care unit and hospital stay, and mortality. Vomiting was more common in LTP patients (8.3 % vs. 2.5 % in the SRP, $p = 0.013$).

Conclusions: Critically ill patients positioned in the LTP had a statistically significant reduction in the incidence of VAP, compared with those positioned in the SRP. A comprehensive evaluation of potential LTP contraindications is warranted to enhance safety.

References

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The effects of oral rinse with 0.2 % and 2 % chlorhexidine on oropharyngeal colonization and ventilator associated pneumonia in adults' intensive care units

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Introduction: Ventilator Associated Pneumonia (VAP) is the most common nosocomial infection in Intensive Care Units (ICUs), which increases the length of ICU stay, duration of mechanical ventilation, and mortality.

Objectives: The present study used an oral care protocol and compared the effects of two different concentrations of chlorhexidine on reduction of oropharyngeal colonization and VAP.

Methods: This study was performed on 114 patients from trauma, surgery, neurosurgery, and general ICUs randomly allocated to two groups under oral care with 0.2 % and 2 % chlorhexidine solution. A multidisciplinary team approved the oral care protocol. The data were collected using a demographic information form, Apache IV form, Beck oral assessment scale, mucosal-plaque assessment scale, and oropharyngeal swab culture.

Results: The results showed a significant reduction in VAP ($p = 0.007$) and oropharyngeal colonization ($p = 0.007$) in the group under oral care with 2 % chlorhexidine solution compared to the other group. However, no significant difference was found between the two groups in terms of oropharyngeal adverse effects ($p = 0.361$).

Conclusions: Oral decontamination with 2 % compared to 0.2 % chlorhexidine is a more effective method in prevention of VAP and reduction of oropharyngeal colonization (especially gram-positive).

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