

A semirecumbent body position produced a lower rate of nosocomial pneumonia than did a supine position in mechanically ventilated adults

Drakulovic MB, Torres A, Bauer TT, et al. Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: a randomised trial. *Lancet*. 1999 Nov 27; 354:1851-8.

QUESTION

In patients who are intubated and mechanically ventilated, is a semirecumbent body position more effective than a supine body position for reducing the incidence of nosocomial pneumonia?

DESIGN

Randomized (allocation concealed*), unblinded,* controlled trial with follow-up to 72 hours after extubation. An interim analysis was planned.

SETTING

2 intensive care units (ICUs) of a 1000-bed, tertiary care, university hospital in Spain.

PATIENTS

90 patients (mean age 65 y, 76% men) in the ICU who had been intubated and mechanically ventilated. Exclusion criteria were recent abdominal surgery or neurosurgery, shock refractory to fluids or inotropes, or previous endotracheal intubation. 96% of patients completed the trial.

INTERVENTION

43 patients were allocated to a semirecumbent body position (45° from the horizontal) and 47 to a supine body position.

MAIN OUTCOME MEASURES

Clinically suspected nosocomial pneumonia. Secondary outcome was microbiologic nosocomial pneumonia confirmed by bronchoalveolar lavage or protected specimen-brush cultures.

MAIN RESULTS

The study was stopped early when analysis showed that the semirecumbent position was superior. Fewer patients in the semirecumbent group developed clinically suspected ($P = 0.003$) or microbiologically confirmed ($P = 0.018$) nosocomial pneumonia than in the supine group (Table). The groups did not differ for mortality (18% in the semirecumbent group vs 28% in the supine group, $P = 0.3$).

CONCLUSION

For patients in the intensive care unit who were mechanically ventilated, a semirecumbent body position was associated with a lower rate of nosocomial pneumonia than was a supine position.

Sources of funding: Commissionat per a Universitats i Recerca de la Generalitat de Catalunya 1997 Suport dels Grups de Recerca; Fundació Clínic; Comissió Interdepartamental de Recerca i Innovació Tecnològica; IDIBAPS; European Respiratory Society.

For correspondence: Dr. A. Torres, Hospital Clínic i Provincial, Servei de Pneumologia i Allèrgia Respiratòria, Villarroel, 170, E-08036 Barcelona, Spain. FAX 34-93-2275454. ■

*See Glossary.

Semirecumbent vs supine body position for prevention of nosocomial pneumonia 72 hours after extubation†

Pneumonia	Semirecumbent	Supine	RRR (95% CI)	NNT (CI)
Clinically suspected	8%	34%	77% (35 to 93)	4 (3 to 11)
Microbiologically confirmed	5%	23%	78% (19 to 94)	6 (4 to 29)

†Abbreviations defined in Glossary; RRR, NNT, and CI calculated from data in article.

COMMENTARY

Previous randomized trials comparing supine with semirecumbent positioning have evaluated surrogate outcomes for pneumonia. Torres and Orozco-Levi and their colleagues (1, 2) found higher radioactive counts in endobronchial secretions in patients who were supine rather than semirecumbent. Ibanez and colleagues (3) found more scintigraphic evidence of esophageal reflux in patients in the supine position.

The trial by Drakulovic and colleagues used the outcome of nosocomial pneumonia. This trial was randomized, the allocation was concealed, and the patients were similar at baseline. Obviously, blinding of the ICU team to body position was not possible, which made the objective definitions of pneumonia very important. Some co-interventions were similar between groups. No patients received frequent ventilator circuit changes or selective digestive decontamination, and all had sterile endotracheal suctioning. However, the ICU team decided whether to use enteral feeding. Sucralfate was used as a stress ulcer prophylaxis for patients receiving enteral nutrition; ranitidine or omeprazole was used for patients who were not. In terms of generalizability, the patients in the study are well described, the exclusion criteria are clear, and the intervention is affordable.

One important interaction between enteral nutrition and supine body position was found. Clinically suspected pneumonia was highest (50%) when enteral feeding was given in the supine position compared with 9% for enteral feeding in the semirecumbent position, 10% for no enteral feeding in the supine position, and 6% for no enteral feeding in the semirecumbent position ($P < 0.001$).

In the absence of contraindications (e.g., ionotrope independence) or competing alternative positions (e.g., proning), semirecumbency appears to be a low-technology, implementable pneumonia prevention strategy for patients who are mechanically ventilated, especially those receiving general nutrition.

*Deborah J. Cook, MD
McMaster University Faculty of Health Sciences
Hamilton, Ontario, Canada*

References

- Torres A, Serra-Battes J, Ros E, et al. *Ann Intern Med*. 1992;116:540-3.
- Orozco-Levi M, Torres A, Ferrer M, et al. *Am J Resp Crit Care Med*. 1995;152:1387-90.
- Ibanez J, Panafiel A, Raurich JM et al. *Journal of Parental and Enteral Nutrition*. 1992;16:419-22.