Semirecumbent position in intensive care patients

Sir—Semirecumbency reduces the frequency of pneumonia in mechanically ventilated patients, report Mitra Drakulovic and colleagues (Nov 27, p 1851).1 Is this position safe as well as effective? Femoral vein calibre is increased and blood flow is slowed in semirecumbency when compared with the supine position.2 Venous stasis resulting from leg elevation has been advocated to avoid venous stasis and prevent deep-vein thrombosis.3,4 In semirecumbency venous blood flow in the lower extremities is hindered; even in the horizontal position blood flow in the femoral vein flows uphill from the back of the knee to the front of the groin. Could semirecumbency avoid pneumonia but induce venous thromboembolism? Bruno Simini Ospedale, 55100 Lucca, Italy

4 Ashby EC. Leg elevation in prophylaxis of thromboembolism. Lancet 1993; 342: 1562.

Sir—Mitra Drakulovic reports1 on supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients. These workers offer good news and bad news; on the one hand, semirecumbent position effectively reduced the rate of pneumonia, but on the other hand, mortality did not differ significantly between patients in supine and in semirecumbent position. Unfortunately, we are left rather in the dark for the detailed causes of death of the patients. Nor do they discuss a possible influence of the semirecumbent position on haemodynamics, although the position of a patient has been proved to potentially affect haemodynamics.

Extreme lateral posture to the left enforces a hyperdynamic state, and extreme lateral posture to the right impairs right ventricular preload and predisposes to hypotension in critically ill patients.2 Prose position does not affect haemodynamic indices.3 Healthy people react to a head-up tilt, with an angle similar to that of Drakulovic’s patients, with a decrease in stroke volume.4 The effect of semirecumbent position on intensive care patients is not yet clear, but some react with a caudal shift of blood and haemodynamic impairment.5

Not everything, that is good for the lungs is necessarily just as good for the circulation; we therefore suggest that a critical evaluation of the impact of the semirecumbent position on the haemodynamic situation of critically ill patients ought to be done before the newly recommended positioning of patients becomes routine.

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excluded from the control group. Also, a patient in a permanent supine position was diagnosed as having a microbiologically proven pneumonia despite the low oxygen samples being sterile. We find it incredible that in the supine group two cases of pneumonia caused by methicillin-resistant *Staphylococcus aureus*, which is normally sensitive to commonly used antimicrobials. It is also surprising that there was no *S aureus* in the test group. No mention is made of the antibiotic policy used in this study.1

If the sterile pneumonia had not been included and the *Candida* spp and enterococcus had been discounted as well as the two preventable *S aureus* pneumonias, then there were fewer true cases of pneumonia, 7/47 (14%) in the supine group versus two (5%) of 39 in the semirecumbent group (p=0.14). The fact that we did not justify stopping the trial. In any case could such a small sample size warrant a change in practice?

Finally, oropharyngeal cultures allow distinction between endogenous pneumonias caused by organisms present in the oropharynx and exogenous pneumonias by organisms occurring from elsewhere bypassing the oropharynx. This is particularly relevant for respiratory ICU with a higher potential for patients with tracheotomies, known to be at higher risk of acquiring methicillin-resistant *S aureus* (MRSA).3 In the whole study there were only two cases of MRSA pneumonia and again in the control group. Did either have a tracheotomy? There is no information on throat swabs in the study: are the organisms causing the cases of pneumonia endogenous or exogenous? Differences in body position cannot prevent exogenous MRSA.


Author’s reply

Sir—Bruno Simini argues that the reduction in blood flow velocity in the femoral vein could have increased the incidence of thromboembolism in our patients. This important comment has a sound pathophysiological basis, however, the clinical relevance may be overemphasised. First, Ashby and colleagues2 proved low blood velocity in the head-up position but did not investigate whether this also translates into a higher incidence of venous thromboembolism (VT). Second, all our patients received a low-molecular-weight heparin for prophylaxis of VT and were screened daily for clinical signs of deep venous thrombosis (DVT). Third, DVT does not necessarily cause clinically important pulmonary embolism, especially in the respiratory ICU. Accordingly, the incidence of DVT in our study was low and no fatality was attributable to embolism. However, critically ill patients in a semirecumbent position should be screened daily for clinical signs of DVT and it may also be advisable to monitor cardiac output when the patient is brought into the semirecumbent position for the first time.

The comments by Georg Röggla and Martin Röggla are focused on possible adverse cardiac effect of the semirecumbent position. They suggest that changes in arterial haemodynamics may have increased mortality in the semirecumbent group. Crude mortality was lower in the semirecumbent group and suggests that the limited sample size was the reason for the lack of significance. Moreover, none of our patients have been cared for in extreme lateral—neither left nor right—or prone position. Also, patients with refractory shock were excluded before the study and later no patient had to be changed from semirecumbent to supine position for medical reasons.

In response to HKF van Saene and colleagues: before our trial we did two studies1 in which we found that there is reflux from gastric contents to the oropharyngeal cavity and even to the lower airways. This reflux was greater in supine position compared to semirecumbent. We confirmed that in the semirecumbent position there is also gastro-oesophageal reflux independent of the size of the nasogastric tube. We based our trial on our previous studies. With regard to their comments on the microbial distribution, I do not know if larger numbers of patients studied could have revealed grampositive organisms in the test group, but many patients with ventilator-associated pneumonia may not have a microbiological diagnosis but clear clinical signs of pneumonia. We do not agree that *Enterococcus* spp and *Candida* spp may not cause pneumonia in mechanically ventilated patients, and we have shown that in two previous studies.6,7 Also, I do not understand why van Saene and colleagues thought we should have excluded two cases of pneumonia caused by *Staphylococcus aureus*. Antibiotic treatments were not strictly controlled in terms of specific antibiotics, but in both units we followed the American Thoracic Society guidelines on nosocomial pneumonia. Finally, although not specifically mentioned in the paper, tracheotomy was a criteria to exclude patients since all tracheotomies are done in the supine position. Patients were included in the study up to the point of tracheotomy.

I agree with van Saene and colleagues that position cannot prevent exogenous pneumonias, but we firmly believe that semirecumbent position can prevent some endogenous pneumonias. Our advice is to nurse mechanically ventilated patients in semirecumbent position as much as possible.

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