Ultrasonography for the Detection of Pneumothorax

To the Editor:

We read with great interest the article published in CHEST by Alrajhi et al1 (March 2012) that strongly emphasizes the usefulness of bedside lung ultrasonography in the diagnosis of pneumothorax, with important implications in the treatment of critically ill patients. However, Alrajhi et al cited only pneumothorax resulting from trauma (six of eight analyzed works) and from invasive procedures (transthoracic needle aspiration and biopsy, two of eight reported works). In our opinion, for completeness, it is also necessary to discuss two other important issues not considered in the meta-analysis of Alrajhi et al: use of lung ultrasonography for diagnosis of iatrogenic pneumothorax deriving from mechanical ventilation, and the effects on ultrasound diagnosis of pneumothorax of the semirecumbent position, indicated for the prevention of ventilator-associated pneumonia.2

Although iatrogenic pneumothorax arising from mechanical ventilation is no longer a frequent outcome, critically ill patients with acute lung injury/ARDS have a substantially elevated risk for pneumothorax in the critical care setting.3 With an incidence ranging up to 38% in critically ill patients with acute lung injury from aspiration pneumonia,4 resulting in a very important effect on days of hospitalization, morbidity, and mortality.5 Surveillance for pneumothorax in the critical care setting is very important because of the high-risk population deriving from underlying disease: In this setting, chest radiograph is usually performed in the semirecumbent position. Instead, in the works considered in the meta-analysis of Alrajhi et al, chest radiographs were performed predominantly in the supine position, and only in 34 of the 864 available chest radiograph data in the semirecumbent position. To the best of our knowledge, there are no data available from the literature comparing test characteristics of ultrasonography and chest radiograph both performed in the semirecumbent position. Further studies may be needed for the adoption in the critical care setting, especially in ventilated patients who have to stay in the semirecumbent position for the prevention of pneumonia associated with ventilation.

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REFERENCES


Response

To the Editor:

We thank Drs Peris and Barbani for their interest in our CHEST article (March 2012) on ultrasonography for the diagnosis of pneumothorax. Our search strategy for the meta-analysis did not include any restrictions by etiology. Only the articles that met the predefined inclusion criteria were included, none of which was performed on ventilated patients. The presence or absence of lung sliding and/or comet tails allows the ultrasonographer to recognize the presence of air in the pleural space (pneumothorax), regardless of its etiology. It is our opinion that there is no physiologic or sonographic reason to believe that ultrasonography would perform differently when the etiology is different. It is, however, the case that preexisting or concurrent conditions like the presence of ARDS can lead to false-positive ultrasonography studies.2 As this was not the objective of our study, we have not discussed this, but as Drs Peris and Barbani point out, it warrants further exploration.

Drs Peris and Barbani comment on the limited number of radiographs performed in the semirecumbent position. We were unable to find studies comparing the performance of supine and semirecumbent radiographs in a clinical setting to diagnose pneumothorax. We do see some difference between those in clinical practice, but it is unclear as to the magnitude of that difference and whether there is a change in position of ultrasonography.