In the great majority of the cases, the therapy suggested by the surveillance cultures was appropriate for the actual pathogen of VAP and required fewer antimicrobial-days than would be necessary in a guideline-based approach. The guideline approach relies on deescalation, and, thus, between 2 and 4 antimicrobial-days would be added, compared with using therapy-guided ETA surveillance cultures. Finally, in those cases in which the therapy based on ETA surveillance cultures was totally or partially inappropriate, the initial prescription would be replaced by a new antimicrobial therapy for 10 days, adding 10 to 20 antimicrobial-days to the one, two, or three antimicrobials administered inappropriately during the first 2 days (2, 4, or 6 antimicrobial-days); in this instance, the sum of antimicrobial-days could be greater, the same, or even less than the number of antimicrobials received if the therapy had been guided by the ATS/IDSA guidelines.

As a consequence of these considerations, the number of antimicrobial-days could be significantly higher with the therapy guided by the ATS/IDSA guidelines than with surveillance cultures, without putting patients at risk of a poor outcome. Even though the instances of inappropriate therapy could be significantly higher using the ETA-guided therapy, some of the difference could be related to the empirical use of dual antipseudomonal therapy when guidelines are followed, even though outcome studies do not support a proven benefit of dual therapy beyond assuring appropriate coverage, which could have already been achieved with a single agent, using surveillance cultures.2 Thus, there are plausible explanations for our findings that could lead to less antimicrobial use and not add to patient risk of adverse outcome.

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REFERENCES

Aerosolized Colistin Cost-effectiveness

To the Editor:

We read with great interest the article by Tumbarello et al1 in a recent issue of CHEST (December 2013). The authors demonstrated that in critically ill patients with ventilator-associated pneumonia (VAP) caused by colistin-only susceptible gram-negative bacteria, aerosolized (AS) plus IV (AS+IV) colistin (as compared with IV colistin alone) can significantly improve clinical cure rates (69.2% vs 54.8%, P = .03) and reduce the need for mechanical ventilation (MV) after VAP onset (5 days vs 12 days, P = .001). Also, patients in the AS+IV group had 2 fewer ICU days after VAP onset (median, 12 days vs 14 days), 1.5 fewer days total ICU stay (median, 24.5 days vs 26 days), and 3 days shorter duration of colistin treatment (median 7 days vs 10 days) compared with the IV group.

However, nothing is recommended regarding the possible cost benefits as a result of these findings. For example, in Greece, IV colistin formulations (each vial contains 75 mg of colistin mesilate sodium, equal to 1 million International Units) cost €3.92 per vial; AS colistin formulations cost €2.93 per vial. Considering that the usual dose for IV therapy is 3 million International Units tid, and 1 million International Units tid for AS colistin, the total cost for 10 days of AS+IV therapy, the costs are €532.8, whereas for a 7-day combination of AS+IV therapy, the costs are €435.183. Thus, 7-day AS+IV therapy is less expensive as compared with 10-day IM monotherapy by €97.617 per patient. Also, median total variable daily ICU costs in our ICU are €575.63; the costs for intubated patients are €562.3 and €386.3 for nonintubated patients (data not published). Thus, a considerable cost benefit may occur as a result of fewer days under MV and shorter length of ICU stay.

Taking all factors into account, the use of AS+IV colistin therapy may be a cost-effective strategy in patients with VAP in terms of shorter duration of therapy, fewer days under MV, and shorter ICU stay in addition to significantly better clinical outcomes. These observations are of significant interest in terms of cost-effectiveness of AS+IV colistin therapy for the management of gram-negative bacteria VAP, which should be further investigated in large, multicenter, randomized controlled trials.

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Response

To the Editor:

We thank Drs Myrianthefs and Baltopoulos for the data reported in their letter. They used the results of our recently published study in CHEST® to evaluate the different economic outcomes of patients in the ICU with ventilator-associated pneumonia (VAP) treated with IV colistin monotherapy or aerosolized plus IV (AS + IV) colistin therapy in a Greek hospital. They found that 7-day AS + IV colistin therapy is less expensive than 10-day IV colistin monotherapy. They also found that a considerable cost benefit may occur as a result of fewer days under mechanical ventilation (MV) and shorter length of ICU stay. Of course, we agree with them that the use of AS + IV colistin therapy can be a cost-effective strategy in patients with VAP, shortening the duration of therapy, MV, and ICU stay and achieving better clinical outcomes.

Because our study was retrospective, a proper cost assessment was not completely reliable, especially in the absence of parameters whose prospective collection would have been important (ie, those related to nurse workload). Consequently, we preferred to not speculate on the cost-benefit analysis. As the total length of hospitalization is the main cost driver, in our institution a considerable cost benefit would also be expected as a result of fewer days under mechanical ventilation and shorter ICU length of stay. In conclusion, the cost-effectiveness of AS + IV colistin therapy for the management of VAP caused by multidrug-resistant gram-negative bacteria should be an important end point to be further investigated in multicenter prospective randomized clinical trials.

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References


Prediction of Postoperative Lung Function in Patients With Lung Cancer

The Role of Quantitative CT Imaging

To the Editor:

We read with great interest the article by Brunelli et al1 in the third edition of the American College of Chest Physicians lung cancer guidelines published in CHEST (May 2013) regarding the physiologic evaluation of the patient being considered for resectional surgery. We certainly appreciate the clarity of the presented data and strongly believe that they provide an evidence-based approach to the preoperative evaluation of lung resection candidates.

Prediction of postoperative lung function has a key role in the proposed algorithm; however, we believe that the proposed method of performing this prediction, especially in case of lobectomy, is not optimal. The anatomic method based on the formula predicted postoperative FEV₁ = preoperative FEV₁ × (1 − y/z), where y is the functional or unobstructed lung segments to be removed, and z is the total functional segments, was proposed by Bolliger et al2 as a simpler alternative to the Nakahara formula (which took into account functional subsegments), since its predictive capability was equal to the latter. However, quantitative CT imaging has been tested in the prediction of postoperative lung function and has yielded more accurate predictions than the segment-counting method. Ueda et al3 demonstrated that volumetric analysis via quantitative CT imaging was better for estimating the functional contribution of a specific lung lobe, compared with segment counting, especially in cases where the functional contribution of every segment varies due to underlying diseases such as pulmonary emphysema or fibrosis, which may be heterogeneously distributed. Ohno et al4 demonstrated that the correlation coefficient was lower and the limits of agreement of the anatomic method were larger than those of quantitative CT imaging. Yoshimoto et al5 confirmed that the segment-counting method is inferior to quantitative CT imaging for predicting postoperative lung function after lobectomy.

Volumetric analysis via quantitative CT imaging is fast, accurate, and technically simple and is performed by analyzing the already existing data of the chest CT scan, which is available in any case, since it is routinely performed in all patients with lung cancer. The predictive capability of quantitative CT imaging has also been compared with perfusion scanning, and both methods yielded similar results, with small differences either in favor of perfusion scanning or in favor of quantitative CT imaging.6 We believe that quantitative CT imaging should be the method of choice in predicting postoperative lung function, not only after lobectomy but also after pneumonectomy, thus, obviating the need for perfusion scanning.

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