



## LETTERS TO THE EDITOR

### Antibiotic resistance: thinking outside the hospital



### Resistencia a antibióticos: pensando fuera del hospital

Dear Editor:

We have read with some interest an article published recently in the journal, related to antibiotic prophylaxis against ventilator-associated pneumonia (VAP) in patients with coma.<sup>1</sup>

The randomized clinical trial (RCT) developed in 1997 by Dr. Sirvent and his group<sup>2</sup> showed the efficacy of antibiotic prophylaxis against VAP on intubated patients with structural coma. Other authors, with different methodologies (type of antibiotic, duration of therapy and design of the study) reached similar findings in favor of the utility of antibiotic prophylaxis after intubation as a preventative measure against VAP, setting a trend in the daily clinical practice of a large number of intensive care units (ICU) worldwide.

We share concerns about progressive resistance to cefuroxime and amoxicillin-clavulanate of germs that cause respiratory infection in this group of patients, which would make this protective measure against a potentially lethal complication obsolete.

The protocol of empirical antibiotic therapy for aspiration pneumonia in our hospital includes, as occurs in others, amoxicillin-clavulanate as first choice. Our group has recently performed a retrospective, observational study<sup>3</sup> trying to identify resistance patterns of the most common microorganisms isolated from bronchial aspirates in patients admitted to the ICU after resuscitated cardiac arrest. Patients admitted after resuscitated cardiac arrest during the years 2013–2015 were included. The inpatient cases included met a hospital stay <48 h without prior antibiotic therapy. The patients who had had tracheo-bronchial secretion cultures in the first 72 h after hospital admission were selected. A total of 62 patients were included. In most (87.1%), the cardiac arrest had an out-of-hospital origin. Therapeutic hypothermia was performed in 50.0% of the patients. The most commonly used empirical

antibiotic was amoxicillin-clavulanate (54.8%), followed by piperacillin-tazobactam (6.5%) and levofloxacin (4.8%). Microbiological isolation in bronchial aspirates was obtained in 24 patients (38.7%). The most frequent were *Staphylococcus aureus* (22.2%), *Escherichia coli* (14.8%), *Enterobacter cloacae* (14.8%) *Klebsiella pneumoniae* (11.1%), *Serratia marcescens* (11.1%) and *Haemophilus influenzae* (7.4%). It was observed that 48.1% of the isolates were resistant to amoxicillin-clavulanate, 18.5% to piperacillin-tazobactam and 14.8% to third-generation cephalosporin. No microorganism was resistant to quinolones or carbapenems. The epidemiology of our healthcare environment is similar to that described in another recent study,<sup>4</sup> which showed a high rate of resistance to amoxicillin-clavulanate (15.0%).

Due to the high prevalence of amoxicillin-clavulanate resistant microorganisms isolated in early respiratory infections in these patients, we agree with Dr. Sirvent that the use of more effective antibiotics should be assessed instead of cefuroxime or amoxicillin-clavulanate. However, it is crucial to take into account the local epidemiology and the individual characteristics of each patient, as well as to evaluate the risk of resistance development that this fact could entail. The design of new RCT's could clarify, in coming years, the best path to follow.

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### Conflicts of interest

The authors declare that they have no conflicts of interest.

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## Reply to ‘‘Antibiotic resistance: thinking outside the hospital’’



### Respuesta a «Resistencia a antibióticos: pensando fuera del hospital»

*Dear Editor,*

We have read with interest the letter by Roldán-Reina et al.<sup>1</sup> in relationship with our point of view published in this journal<sup>2</sup> referring to the original article published 20 years ago.<sup>3</sup> We fully agree with the authors on their concern for progressive resistance of microorganisms that cause respiratory infection to cefuroxime and amoxicillin-clavulanic and consequently that they have become obsolete, these antibiotics should not be used for the prevention of ventilator-associated pneumonia in intubated coma patients.

The authors described the results of their recent retrospective and observational study<sup>4</sup> to evaluate the resistance patterns of the common microorganisms isolated from bronchial aspirates in patients admitted to the ICU after resuscitated cardiac arrest. In the study the most frequent were *Staphylococcus aureus* (22.2%), *Escherichia coli* (14.8%), *Enterobacter cloacae* (14.8%), *Klebsiella pneumoniae* (11.1%), *Serratia marcescens* (11.1%) and *Haemophilus influenzae* (7.4%). They observed that 48.1% of the isolated microorganisms were resistant to amoxicillin-clavulanic, 18.5% to piperacillin-tazobactam and 14.8% to third-generation cephalosporin. They described no microorganism was resistant to quinolones or carbapenems.

Thus, the authors give us an approximate idea as to what might be an alternative to cefuroxime for prevention of ventilator-associated pneumonia in coma patients, and we believe is time to develop new RCT to study other antibiotics for prophylaxis with no effect on normal anaerobic microbiota and with a broad-spectrum to Gram-positive and enteric Gram-negative bacilli. A good alternative to

cefuroxime might be levofloxacin, because the pharmacological properties are suitable and it is active against the causative micro-organisms.<sup>5</sup> However, we should pay special attention to the development of local antibiotic resistance, and maintaining the antibiotic prophylaxis only 24h (one dose in case of levofloxacin).

## References

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