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## Editorial

## What has Changed in Community-Acquired Pneumonia in Recent Years? ☆



### ¿Qué ha cambiado en la neumonía adquirida en la comunidad en los últimos años?

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Community-acquired pneumonia (CAP) can present with a wide range of symptoms, ranging from a mild clinical syndrome to more severe forms that may need hospitalization and even admission to the intensive care unit (ICU). In individuals over 65 years of age, it is one of the major causes of death and the greatest cause of death from infectious disease.<sup>1</sup> The fact that it continues to be a problem is shown by a recent study that reports an increase of up to 8.8% in hospitalizations in recent years, and increased rates of infection caused by enterobacteriaceae.<sup>2</sup>

Since the appearance of influenza A and the routine use of molecular detection techniques, more and more evidence is emerging on the role of viruses as etiological and/or concomitant agents in CAP. In general, influenza A virus and respiratory syncytial virus are still the most common, but the highly fatal coronavirus outbreaks in recent years and the zoonosis of the influenza virus suggest that we should be on the alert for these new emerging pathogens.<sup>3</sup> Viral pneumonias have led to other complications such as obesity and pregnancy being added to the list of comorbidities included in risk scales as factors for severity in this type of pneumonia.

Risk evaluation has always focused on predicting in-hospital mortality. However, evidence suggests an increase in mortality at 30 days and even up to 5 years after CAP, mainly due to heart diseases. Readmission after CAP was also required in up to 18% of cases, either for the same pneumonia or for extrapulmonary (primarily cardiovascular) complications,<sup>4</sup> and reincorporation into activities of daily living was also delayed, particularly in elderly patients. Prognostic scales, then, should perhaps not be limited to evaluating short-term or in-hospital mortality, but instead should be designed to predict other variables that are important in the survival and quality of life of CAP patients.

These scales, moreover, cannot accurately predict the severity of the CAP, or the most appropriate setting for treatment. The most widely used scales, such as the PSI and the CURB-65 or CRB-65, are not useful for determining admission to the ICU, and other evaluations, including systolic blood pressure, multilobar infiltrates,

albumin, respiratory rate, tachycardia, confusion, oxygen, and pH (SMARTCOP) seem to be more useful for identifying patients who will need respiratory or hemodynamic support. Along the same lines, it would be relatively easy to add comorbidities and oxygen saturation to the previously used scales CURB-65 (DS-CURB-65).<sup>5</sup> In conventional scales, age is one of the most weighted variables, and this can distort the score: one way to correct this in subjects over 76 years of age may be to incorporate SOAR (oxygen saturation, age and respiratory rate). This approach has shown greater sensitivity for predicting mortality than the CRB-65, but its specificity is low.

In recent years, the possibility of using biomarkers as predictors for mortality has been explored; procalcitonin (PCT) has been one of the most widely studied markers, with a low PCT on admission being associated with low mortality, irrespective of PSI or CRB-65. A great many others, such as PaCO<sub>2</sub>, platelet count, and proadrenomedullin, have also been studied.

Comorbidities are known to impact the course and prognosis of CAP, and the list is regularly reviewed. Although COPD is not included in the most common scales,<sup>6</sup> it plays an undeniably important role, since it can not only determine the course of the disease (indeed COPD patients have higher PSI scores, higher admission rates, and higher 30 and 90-day mortality<sup>7</sup>), but can also induce an etiology involving difficult-to-treat bacteria such as *Pseudomonas aeruginosa* pneumonia.

In addition to the impact of comorbidities on the initial evaluation of CAP, the close relationship between cardiovascular complications and pneumonia during the acute phase and in the months following recovery must be taken into account. The inclusion of heart function biomarkers seems to improve the reliability of standard prognostic scales. However, some cardiac events, such as arrhythmias, myocardial infarction, previous decompensated heart failure or cardiac arrest, both in the short and long term,<sup>8</sup> might justify the inclusion of new monitoring techniques during CAP, such as heart monitoring or measures for the prevention of cardiovascular diseases.

With regard to treatment, it is clear that early administration of the shortest possible course of antibiotic therapy is essential. Nevertheless, 2 questions regarding the treatment of CAP are open to debate: the use of macrolides and of corticosteroids. The addition of macrolides to the treatment of non-severe CAP is still

☆ Please cite this article as: Alfageme Michavila I. ¿Qué ha cambiado en la neumonía adquirida en la comunidad en los últimos años?. Arch Bronconeumol. 2017;53:3-4.

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controversial, although adding macrolides in severe pneumonia has clearly shown a reduction in mortality.<sup>9</sup> This lack of a clear recommendation is further confounded by the potential risk of undesirable cardiovascular effects.

Despite important publications showing the potential benefit of the addition of corticosteroids in reducing the time needed to achieve clinical stability and in preventing antibiotic failure, 2 metaanalyses have found that the addition of corticosteroids to CAP treatment does not reduce mortality in the general population. However, the addition of macrolides does shorten hospital stay and time to clinical stability, and even prevents acute respiratory distress syndrome.<sup>10</sup>

The latest SEPAR guidelines on CAP were published over 6 years ago. Evidence suggests that some aspects of our management of CAP should be modified, so perhaps it is time for an update.

## References

1. Fry AM, Shay DK, Holman RC, Curns AT, Anderson LJ. Trends in hospitalizations for pneumonia among persons aged 65 years or older in the United States, 1988–2002. *JAMA*. 2005;294:2712–9.
2. Quan TP, Fawcett NJ, Wrightson JM, Finney J, Wyllie D, Jeffery K, et al. Increasing burden of community-acquired pneumonia leading to hospitalisation, 1998–2014. *Thorax*. 2016;71:535–42.
3. Galván JM, Rajas O, Aspa J. Revisión sobre las infecciones no bacterianas del aparato respiratorio: neumonías víricas. *Arch Bronconeumol*. 2015;51:590–7.
4. Dharmarajan K, Hsieh AF, Lin Z, Bueno H, Ross JS, Horwitz LJ, et al. Diagnoses and timing of 30-day readmissions after hospitalization for heart failure, acute myocardial infarction, or pneumonia. *JAMA*. 2013;309:355–63.
5. Kolditz M, Ewig S, Schütte H, Suttrop N, Welte T, Rohde G. Assessment of oxygenation and comorbidities improves outcome prediction in patients with community-acquired pneumonia with a low CRB-65 score. *J Intern Med*. 2015;278:193–202.
6. Jiang HL, Chen HX, Liu W, Fan T, Liu GJ, Mao B. Is COPD associated with increased mortality and morbidity in hospitalized pneumonia? A systematic review and meta-analysis. *Respirology*. 2015;20:1046–54.
7. Restrepo MI, Mortensen EM, Pugh JA, Anzueto A. COPD is associated with increased mortality in patients with community-acquired pneumonia. *Eu Respir J*. 2006;28:346–51.
8. Santos-Gallego CG, Badimon JJ. Cardiac complications after community-acquired pneumonia. *Am J Cardiol*. 2016;117:310.
9. Sliql WI, Asadi L, Eurich DT, Tjosvold L, Marrie TJ, Majumdar SR. Macrolides and mortality in critically ill patients with community-acquired pneumonia: a systematic review and meta-analysis. *Crit Care Med*. 2014;42:420–32.
10. Siemieniuk RA, Meade MO, Alonso-Coello P, Briel M, Evaniew N, Prasad M, et al. Corticosteroid therapy for patients hospitalized with community-acquired pneumonia: a systematic review and meta-analysis. *Ann Intern Med*. 2015;163:519–28.