

Recommendations and implementation of guidelines for community-acquired pneumonia: more problems than solutions

Recomendações e implementação de diretrizes sobre pneumonia adquirida na comunidade: mais problemas do que soluções

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Pneumonia is the third leading cause of death worldwide and the leading cause of death in countries with low per capita income.⁽¹⁾ It is responsible for a large number of hospitalizations and a significant expenditure of health care resources. In Brazil, which is classified as an upper-middle-income country (US\$ 3,976 to US\$ 12,275), pneumonia is the fourth leading cause of death.⁽¹⁾ In 2009, life expectancy at birth for Brazilians increased to 73.2 years (70 and 77 years for men and women, respectively).⁽²⁾ Of the 190 million Brazilians, 7.6% are 65 years of age or older, and this segment of the population has a larger number of comorbidities, is more susceptible to pneumonia and its complications, and is subject to higher mortality rates.⁽³⁾ Of the 722,000 hospitalizations for pneumonia reported in Brazil in 2011, 194,000 (27%) were in individuals over 65 years of age.⁽³⁾ Of the 47,000 deaths from pneumonia, 33,000 (70.2%) occurred in individuals in that age group.⁽³⁾ Approximately 600 million Brazilian reais (R\$) were allocated to the management of pneumonia, compared with R\$ 240 million spent on the management of acute myocardial infarction and R\$ 126 million spent on the management of stroke.⁽³⁾

The advent of penicillin and other antibiotics in the 1940s had a dramatic effect on the prognosis of various bacterial infections, especially pneumococcal pneumonia, the mortality rates for the disease having dropped from 25–35% to 5% in the following decades.⁽⁴⁾ This resulted in excessive optimism about the treatment of pneumonia, which focused on the pathogen and on antibiotic therapy. In the subsequent decades, the phenomenon of bacterial resistance and the factors related to the host immune response gained prominence. Despite advances in scientific knowledge and despite immunization strategies, mortality from community-acquired pneumonia (CAP) has remained unchanged in the last five decades. Various concepts regarding the pathogenesis of pneumonia have been reviewed.⁽⁵⁾ Whereas infection results from a microbiological

phenomenon, systemic inflammatory response translates a complex host response to various stimuli, among which is infection. Factors related to senescence and host immune response have come to be valued. Molecular analysis of bacterial load, production of toxins, and the immunomodulatory effect of certain antibiotics have aroused interest. In addition to allowing the distinction between higher-risk and lower-risk patients, biomarker-guided treatment strategies have been shown to play a promising role in the decision-making process, particularly with regard to reduction in antibiotic consumption (treatment initiation and duration of use), making it possible to reduce selective pressure, treatment costs, and possible adverse effects. Adjuvant therapy, which goes beyond antibiotic use and includes fluid resuscitation, oxygen therapy, ventilatory and hemodynamic support, control of decompensated comorbidities, correction of electrolyte disturbances, and early treatment of sepsis, has prognostic value. Although various studies have attempted to demonstrate the efficacy of early empirical therapy, which is comparable to that of pathogen-directed treatment, there are many limitations in the identification of the etiology of CAP, especially at the time of therapeutic decision making. The role of rapid tests, such as urinary antigen tests, has yet to be defined. The use of severity scores allows risk stratification of patients, as well as defining the place of treatment. This strategy has proved useful in treating low-risk patients in an outpatient setting, as well as proposing measures that are more effective and immediate for those who are at higher risk. In addition, the establishment of stability criteria has allowed the use of sequential therapy and early hospital discharge.

For many years, patient care was based on recommendations derived from the consensus opinion of experts (consensuses), and evidence originating from well-designed studies was not the main focus. Currently, the concept of guidelines considers a set of recommendations

systematically developed by a group of experts on the basis of evidence in the medical literature.⁽⁶⁾ Guidelines aim at assisting physicians in making decisions under specific clinical circumstances. The objectives of guideline implementation are to improve the quality of health care by reducing the proportion of inconsistent decisions and to streamline the incorporation of scientific and technological advances into medical practice. Guidelines encourage research and allow the development of protocols tailored to the local situation.⁽⁶⁾ Because of its epidemiological significance, CAP has been one of the major targets of guidelines. Many guidelines have been published and systematically updated, with no real benefits to patient care. Therefore, there are more questions than answers regarding the spectrum between evidence-based recommendations and the implementation of guidelines.⁽⁷⁾ The heterogeneity of studies leads to conflicting results. Many are retrospective observational studies involving a small number of patients. Others divide patients into subgroups (outpatients, elderly individuals, or ICU patients) and use different severity scores, as well as measuring distinct outcomes. Some studies have evaluated antibiotic therapy as a primary intervention that can reduce mortality and length of hospital stay, which is highly questionable, whereas others have addressed clinical variables. Mortality in low-risk patients is usually very low. An extremely large number of patients are needed in order to demonstrate the impact of antibiotic therapy on mortality in that subgroup of individuals. Some studies have demonstrated that adherence to guideline recommendations—severity scores being taken into consideration—reduces the number of hospitalizations among low-risk patients,⁽⁸⁾ and that early empirical antibiotic therapy reduces mortality and length of hospital stay.⁽⁹⁾ However, the analysis of specific clinical outcomes on the basis of adherence to guidelines is an arduous task and might not be the best way to evaluate the recommendations. Various studies have analyzed distinct pre-intervention and post-intervention (guideline implementation) clinical outcomes, producing contradictory results. Randomized controlled studies involving well-defined at-risk populations and the systematic use of standardized treatment regimens and prescription management, as well as measuring specific clinical outcomes, have yet to be conducted. In addition to the

low power of the studies on which several recommendations are based, the implementation of guidelines into patient care protocols is a major challenge.⁽¹⁰⁾ In a systematic review involving 76 eligible studies, 293 potential barriers to the implementation of guidelines were identified in 120 different types of surveys. The authors of the review emphasized the need for considering potential local obstacles before implementing guidelines.⁽⁶⁾

In the current issue of the Brazilian Journal of Pulmonology, Silveira et al.⁽¹¹⁾ report an observational study in which the primary objective was to evaluate, retrospectively, the agreement between the admission criteria used for hospitalization of patients with CAP at the Federal University of Minas Gerais *Hospital das Clínicas*, between 2005 and 2007, and those of the Brazilian Thoracic Association guidelines, as well as to evaluate the association of the two sets of criteria with 30-day mortality. In most cases (73.2%), hospitalization was found to be in accordance with the recommendations in the 2004 Brazilian guidelines.⁽¹²⁾ Of the patients evaluated, 66 (58.9%) received treatment in accordance with the guidelines. However, for ICU patients, that proportion dropped to 43.8%. Only 58.9% of the patients received guideline-concordant antibiotic therapy, and 21.4% were treated with a beta-lactam antibiotic in isolation, a regimen that is not in accordance with the guidelines. The 30-day mortality rate was 12.3%, and 10 (76.9%) of the patients who died were 65 years of age or older. The 12-month mortality rate was 19.4%. Despite the merits of the study, there are some limitations, several of which are associated with its retrospective observational design. Of the 709 patients admitted with a diagnosis of CAP, 357 (50.4%) were excluded, 133 had no chest X-rays available, and 31 had no chest X-ray findings consistent with the diagnosis of pneumonia. Therefore, the final study sample comprised only 112 patients (mean age, 57.3 years; median age, 56 years), 42 (37.5%) of whom were 65 years of age or older. The small number of patients over 65 years of age might have affected the mortality rates. A significant lack of information in the medical charts might have led to the inadvertent inclusion of individuals with nosocomial pneumonia or healthcare-associated pneumonia. In addition, time to initiation of antibiotic therapy, total treatment duration, and treatment adherence

after hospital discharge were not evaluated, which might also have affected the mortality rates. Furthermore, the single-center nature of the study precludes the generalization of the results obtained. However, we should praise the initiative of the authors to describe behaviors and attitudes toward CAP patients admitted to a university hospital in Brazil. This stimulates a discussion of the complexity of developing and implementing patient care guidelines, as well as of the various factors involved in this process. The evolution of scientific knowledge will make it possible to improve the evidence base for the recommendations in CAP management guidelines, as well as promoting guideline implementation strategies that are more effective and facilitating guideline adherence, which is essential.

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