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ORIGINAL ARTICLE

Prognosis of hospitalized patients with community-acquired pneumonia

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Survival

Abstract
Introduction: The long-term prognosis of patients with community-acquired pneumonia (CAP) has attracted increasing interest in recent years. The objective of the present study is to investigate the short and long-term outcomes in hospitalized patients with CAP and to identify the predictive factors associated with mortality.
Patients and methods: The study was designed as a retrospective, multicenter, observational study. Hospitalized patients with CAP, as recorded in the pneumonia database of the Turkish Thoracic Society between 2011 and 2013, were included. Short-term mortality was defined as 30-day mortality and long-term mortality was assessed from those who survived 30 days. Predictive factors for short- and long-term mortality were analyzed.
Results: The study included 785 patients, 68% of whom were male and the mean age was 67 ± 16 (18–92). The median duration of follow-up was 61.2 ± 11.8 (37–90) months. Thirty-day mortality was 9.2% and the median survival of patients surviving 30 days was 62.8 ± 4.4 months. Multivariate analysis revealed that advanced age, the absence of fever, a higher Charlson comorbidity score, higher blood urea nitrogen (BUN)/albumin ratios and lower alanine aminotransferase (ALT) levels were all predictors of long-term mortality.

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Conclusion: Long-term mortality following hospitalization for CAP is high. Charlson score and lack of fever are potential indicators for decreased long-term survival. As novel parameters, baseline BUN/albumin ratios and ALT levels are significantly associated with late mortality. Further interventions and closer monitoring are necessary for such subgroups of patients.

Introduction

Community-acquired pneumonia (CAP) is a frequently observed, costly health issue causing significant morbidity and mortality. The incidence of CAP requiring hospitalization is about 25–30 cases per 10,000 adults and, in the USA, constitutes the seventh most frequent cause of all-cause death. Among infectious diseases, CAP is the most frequent cause of hospitalization and mortality in industrialized countries.[1–3]

In hospitalized patients, the mortality rate from CAP is around 10%.[4–7] However, this rate varies depending on the hospital unit and the prognosis is worse for patients requiring treatment in an intensive care unit (ICU).

A large number of studies focus on the causal link between mortality and CAP, most of them analyzing in-hospital and short-term mortality.[8,9] Fewer studies, however, have focused on the association between CAP and long-term mortality. At follow-up, pneumonia patients have displayed lower rates of survival and more frequent all-cause hospitalization, emergency department admissions and CAP-related visits compared to age and gender-matched control subjects without pneumonia.[10] One-year mortality rate for patients with CAP is 17–40%, with increasing rates in the longer-term, independent of demographics and comorbid conditions.[11–13] Recent work has sought to understand the reasons underlying the shorter survival of these patients and the incidence, factors, and predictors of long-term outcome. Long-term prognostic factors to be considered in CAP include advanced age, male gender, black race, health-care associated pneumonia, and chronic comorbid illnesses.[5] To date, only a few systematic data evaluating long-term outcomes for these patients have been reported.

The objective of the present study is to investigate the short and long-term outcome in hospitalized patients with CAP and to identify the predictive factors of mortality.

Methods

This study was designed as a retrospective, multicenter, observational cohort study and was conducted in eight hospitals (seven university hospitals and one training and research hospital) within Turkey. The study complied with the ethical principles of the Declaration of Helsinki and was approved by the local Ethics Committee.

Study population and data collection

We included patients diagnosed with CAP between 2011 and 2013, from all centers around the country. Data have been collected from the Turkish Thoracic Society pneumonia database (TURCAP: Turkey Community Acquired Pneumonia) and hospitalized patients with CAP and an available identity number were included in the study.

Patients were diagnosed with CAP if pulmonary infiltration was visible in a chest X-ray and if there were clinical symptoms such as a cough, purulent sputum, pleuretic chest pain, shortness of breath, fever or findings detectable by auscultation.[14] Patients under 18 years of age, with no registered identity number or having been managed in outpatient clinics, were excluded from the study.

Baseline demographics, symptoms, physical examination findings and vital signs at presentation, smoking status, and comorbid conditions were recorded. Charlson comorbidity score was calculated for each patient.[15,16] Laboratory data included white blood cell count (WBC), and levels of blood glucose, BUN, ALT, albumin and C-reactive protein (CRP). BUN/albumin ratios were calculated.[14] Chest X-ray findings (i.e. alveolar consolidation, interstitial pattern, pleural effusion, lobar or multilobar involvement) were included. The severity of illness scores of CURB-65 (confusion, uremia, respiratory rate, low blood pressure, age 65 years or older) and PSI (pneumonia severity index) was recorded.[17]

Analysis of mortality

Survival status of the patients was assessed via identity numbers using the National Death Certificate Database (www.obs.gov.tr). The 30-day, 90-day, and 1–5 year mortality were calculated for every patient from the day of the presentation. Short-term mortality was defined as 30-day mortality from admission. For the analysis of long-term mortality, those who survived the initial acute event were included and all-cause long-term mortality until the completion of follow-up was assessed.

Statistical analysis

Quantitative data are expressed as mean ± standard deviation (SD) and qualitative data are expressed as frequencies. In-hospital mortality was evaluated using Student's *t*-test and chi-square tests. All-cause mortality was reported for long-term follow-up. Survival curves were drawn using the Kaplan–Meier method. Cox's proportional hazards model was used to determine the potential predictors of mortality. Independent variables associated with mortality with a p value ≤ 0.05 in the univariate analysis were then incorporated into a multivariate analysis, also based on Cox's proportional model. All statistical analyses were conducted using a statistical software package (SPSS for Windows,

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