Correlation of procalcitonin levels with etiology of community-acquired pneumonia (CAP)
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ABSTRACT

Introduction
In hospitalized patients with CAP, the etiology is identified in only a third of the patients. Most patients with identified etiologies are infected with a bacterial pathogen. Procalcitonin (PCT) is a peptide that is induced primarily in bacterial infections. In patients with CAP, PCT serum levels might help clinicians to differentiate between classic bacterial and atypical or viral etiology [4]. However, previous studies have provided inconsistent results regarding the clinical value of PCT.

The objective of this study was to compare PCT levels in CAP patients with an identified pathogen versus patients with unknown etiologies.

Methods

1. A total of 506 patients with CAP were included in the study, 141 with a known etiology and 365 with unknown etiology. There was no significant difference in PCT levels between the groups (P=0.34).

Conclusions

In this study, we failed to see a difference in PCT levels in patients with CAP with known versus unknown etiologies. Our results suggest that bacterial pathogens may be important etiologic agents in hospitalized patients with CAP of unknown etiology. The lack of identification of pathogens may be due to poor sensitivities of current diagnostic tests or bacterial pathogens not detectable with our current techniques.

INTRODUCTION

In hospitalized patients with Community Acquired Pneumonia (CAP), the etiology is identified in only a third of the patients. Most patients with identified etiologies are infected with a bacterial pathogen [1]. Despite the availability of many diagnostic techniques, predicting clinically the etiology of CAP is difficult because bacterial pneumonia cannot be differentiated from non-bacterial pneumonia on the basis of medical history, physical examination, laboratory tests and radiology [2,3].

The utility of serum markers of systemic infection for the differential diagnosis of various infectious conditions has become a matter of interest in the last few years. Procalcitonin (PCT) is a peptide that is induced primarily in bacterial infections. In patients with CAP, PCT serum levels might help clinicians to differentiate between classic bacterial and atypical or viral etiology [4]. However, previous studies have provided inconsistent results regarding the clinical value of PCT.

The objective of this study was to compare PCT levels in CAP patients with an identified pathogen versus patients with unknown etiologies.

Study Design and Study Population

This was a secondary analysis of patients enrolled in the Community-Acquired Pneumonia Organization (CAPO) international cohort study. Data was collected between 2001 and 2015. In each participating center, non-consecutive medical records of hospitalized patients with the diagnosis of CAP were reviewed. A sample of the data collection form is available at the study website (www.caposite.com).

Validation of data quality was performed at the study center before the case was entered in to the CAPO database. Institutional Review Board approval was obtained by each participating center.

Study Definitions

CAP-Definition of CAP required the presence of criterion A, B, and C:

A. New pulmonary infiltrate on imaging (CT scan or chest x-ray) at the time of admission to the hospital.
B. Signs and Symptoms of CAP (at least one of the following): 1. New or increased cough (per the patient) 2. Fever >37.8°C (100.0°F) or hypothermia <35.6°C (96.0°F). 3. Changes in WBC (leukocytosis >11,000 cells/mm³, left shift >10% band forms/microtiter, or leucopenia <4,000 cells/mm³
C. Working diagnosis of CAP at the time of hospital admission with antimicrobial therapy given within 24 hours of admission.

Patients were assigned to the following study categories:

Known etiology: When a pathogen was detected on any of the initial microbiology tests. (Blood culture, Respiratory culture, Legionella antigen urine, Rapid Influenza test, Viral PCR or Atypical PCR.)

Unknown etiology: When no pathogen was detected on any of the initial microbiology test. (Blood culture, Respiratory culture, Legionella antigen urine, Rapid Influenza test, Viral PCR or Atypical PCR.)

Statistical Analysis

Baseline categorical explanatory variables were summarized as frequencies and percentages and differences between both groups of patients were analyzed using a chi-square test or Fisher’s exact test when appropriate and warranted. Boxplots, jitter plots, and the Mann-Whitney U test were used to compare PCT levels between patients with known and unknown etiologies.

RESULTS

• A total of 506 patients with CAP were included in the study, 141 with known etiology and 365 with unknown etiology.
• Patient’s characteristics are shown in the table 1.
• Categories for the study groups and Procalcitonin serum levels are shown in figure 2 and figure 3.
• There was a non-significant difference in PCT levels between the groups (P=0.34).

REFERENCES