



The Brazilian Journal of INFECTIOUS DISEASES

www.elsevier.com/locate/bjid



Original article

Bacteremic pneumococcal pneumonia: serotype distribution, antimicrobial susceptibility, severity scores, risk factors, and mortality in a single center in Chile

Alberto Fica^{a,*}, Nicolás Bunster^b, Felipe Aliaga^c, Felipe Olivares^d, Lorena Porte^e,
Stephanie Braun^e, Jeannette Dabanch^a, Juan Carlos Hormázabal^f, Antonio Hernández^c,
María Guacolda Benavides^g

^a Servicio de Infectología, Hospital Militar de Santiago, Chile

^b Unidad Coronaria, Hospital Militar de Santiago, Chile

^c Unidad de Pacientes Críticos, Hospital Militar de Santiago, Chile

^d Residente Medicina Interna, Hospital Militar de Santiago, Chile

^e Laboratorio de Microbiología, Hospital Militar de Santiago, Chile

^f Subdepartamento de Microbiología, Instituto de Salud Pública, Chile

^g Servicio de Enfermedades Respiratorias, Hospital Militar de Santiago, Chile

ARTICLE INFO

Article history:

Received 28 March 2013

Accepted 3 June 2013

Available online 10 October 2013

Keywords:

Streptococcus pneumoniae

Bacteremia

Serotyping

Microbial drug resistance

Risk factors

Mortality

Elderly

CURB-65

APACHE II

PIRO

ABSTRACT

Aims: Bacteremic pneumococcal pneumonia (BPP) is a severe condition. To evaluate seasonal distribution, mortality, serotype frequencies, antimicrobial susceptibility, and different severity scores among patients with BPP.

Patients and methods: Patients were identified by laboratory data and restricted to adulthood. Standard methods were used for serotyping and antimicrobial susceptibility. Risk factors were analyzed by univariate and multivariate methods. Severity scores (APACHE II, CURB-65 and CAP PIRO) were compared using ROC curves.

Results: Sixty events of community-acquired BPP occurred between 2005 and 2010. A seasonal pattern was detected. Mean age was 72.1 years old (81.4% ≥ 60 years). All had a predisposing factor. Previous influenza (3.3%) or pneumococcal immunization (1.7%) was infrequent. Admission to critical units was required by 51.7%. Twenty-two serotypes were identified among 59 strains. Only one strain had intermediate resistance to penicillin (1.7%). In-hospital mortality reached 33.3%. Multivariate analysis identified a CAP PIRO score > 3 (OR 29.7; IC95 4.7–187), age ≥ 65 years (OR 42.1; IC95 2.2–796), and a platelet count $< 100,000/\mu\text{L}$ (OR 10.9; IC95 1.2–96) as significant independent factors associated with death. ROC curve analysis did not reveal statistical differences between the three severity scores to predict death (AUC 0.77–0.90). The prognostic yield for all of them was limited (Positive Likelihood Ratio: 1.5–3.8).

Conclusions: BPP had a high case-fatality rate in this group of adult patients with no association to resistant isolates, and a low immunization record. Three independent factors were related to death and the prognostic yield of different severity scores was low.

© 2013 Elsevier Editora Ltda. Este é um artigo Open Access sob a licença de [CC BY-NC-ND](http://creativecommons.org/licenses/by-nc-nd/4.0/)

* Corresponding author at: Servicio de Infectología, Hospital Militar de Santiago, Av. Larraín 9100, La Reina, Santiago, Chile.

E-mail addresses: albertofica@gmail.com, afica@hms.cl (A. Fica).

1413-8670 © 2013 Elsevier Editora Ltda. Este é um artigo Open Access sob a licença de [CC BY-NC-ND](http://creativecommons.org/licenses/by-nc-nd/4.0/)

<http://dx.doi.org/10.1016/j.bjid.2013.06.001>

Introduction

Invasive infections due to *Streptococcus pneumoniae* are an important cause of morbidity and mortality with a high disease burden.¹ In addition, invasive disease cases will probably increase in the near future due to population aging.² Bacteremic pneumococcal pneumonia represents an invasive disease that is linked to extreme ages and comorbidities.^{3,4} It has sometimes been associated with a range of different serotypes, antibiotic resistance and a high case-fatality ratio.^{3,5-7} Updated information about antibiotic resistance and serotype distribution is needed for antimicrobial treatment and to evaluate vaccine efficacy. However, data regarding serotype frequencies is scarce in adults in several countries of Latin America because it has mainly been focused on children.^{8,9} In addition, different severity scores have been applied in patient with community-acquired pneumonia or in those seriously-ill^{4,10,11} but not in a specific group of patients such as those with bacteremic pneumococcal pneumonia. We report the result of a 6-year period retrospective study in patients with bacteremic pneumococcal pneumonia. The aims were to examine seasonal distribution, patient characteristics, mortality rate, use of intensive care resources, serotype frequencies, antimicrobial susceptibility, and severity scores prediction yield. Risk factors associated to critical care unit admission and mortality, were also explored.

Patients and methods

Design of study and setting

Retrospective and descriptive study performed at the Hospital Militar de Santiago, Chile. This institution is a 250-bed general hospital for active or retired military personnel and their relatives.

Inclusion criteria and variables included

Every adult patient ≥ 18 years, admitted between 2005 and 2010 with *S. pneumoniae* growing in blood cultures, and with respiratory symptoms and/or pneumonia was included. Potential cases were identified using the microbiology laboratory database. Medical charts were reviewed and data on the following variables were obtained: co-morbidities (pulmonary diseases, cardiac disease, renal failure, diabetes mellitus), immunosuppression, alcoholism or tobacco consumption, influenza and pneumococcal vaccination coverage, clinical manifestations, physical examination, laboratory values, chest X-ray and/or CT information, admission to intermediate or critical care unit, use of vasoactive drugs or shock, antimicrobial therapy, steroid use during the first 72 h of admission, length of stay (LOS) and hospital mortality. APACHE II, CURB-65 and CAP-PIRO severity scores were applied.^{10,11} Data on antimicrobial susceptibility and serotyping were included. The latter was performed in the national reference laboratory. The following operative definitions were applied: tobacco consumption (any quantity of cigarettes per day in the last two years), alcohol consumption (any quantity

of ethanol consumption per day), shock (arterial systolic pressure < 90 mmHg with no response to fluid resuscitation or need for vasoactive drugs), acute renal injury (serum creatinine level > 1.5 mg/dL at admission or 50% increase above the baseline value), acute respiratory distress syndrome (ARDS: PaFiO₂ < 200 and bilateral infiltrates), and complicated pleural effusion (purulent pleural fluid or bacteria on gram stain, requiring a chest tube or surgical drainage).

Statistical analysis

Clinical information is presented in a descriptive manner. Continuous variables were categorized to facilitate analyses. Potential factors linked to in-hospital mortality or intermediate-intensive care unit admission, were explored using chi-square or two-sided Fisher's exact test. Univariate analysis including odds ratios (OR) was performed, adding 0.5 to every cell in the 2×2 contingency table when null cells were present. Multivariate analysis was developed through binary logistic regression. ROC curves were applied in order to compare different numerical variables associated to higher in-hospital mortality, and cutoff values were established. The areas under the curve (AUC) from different predictive scales were compared using Epidat software.

Results

General features

From 2005 to 2010, sixty events of community-acquired bacteremic pneumococcal pneumonia occurred in 59 patients. One patient had two events three years apart from each other. In this case demographics, tobacco smoking, alcohol consumption and co-morbidities were counted once, but data on clinical manifestations, laboratory, radiologic, and vaccine coverage, were counted separately.

Near two-thirds of patients were females. Mean age was 72.1 years old (range 20-96; Table 1). Over 80% of the subjects was 60 years or older, and half was older than 75 years. In addition, one third declared tobacco smoking and almost 20% were alcohol consumers but a detailed characterization on the quantity used was not possible. Medical morbid conditions were frequent in this series, heart disease, different pulmonary conditions, diabetes mellitus, and chronic renal failure predominated. All patients had a predisposing condition and 76% had co-morbidities. No patients with HIV infection or solid or bone marrow transplantation were identified in this series, and influenza or pneumococcal vaccine coverage was exceedingly rare (Table 1).

Bacteremic events were characterized by a severe clinical condition reflected in the relative higher frequency of cyanosis, respiratory rate > 30 min⁻¹, and hypotension (Table 2, whole group column). More than half had an APACHE II score > 15 points and two-thirds a CAP PIRO score > 2 . Cough, fever, and lung sounds in the form of rales or crackles were frequent ($\sim 80\%$, Table 2, whole group). Most patients presented one to seven days of symptoms before admission, but near 15% of events started on the same day of hospitalization (Table 2, whole group).

Download English Version:

<https://daneshyari.com/en/article/3344245>

Download Persian Version:

<https://daneshyari.com/article/3344245>

[Daneshyari.com](https://daneshyari.com)