



Getting to know our pneumococcus

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In this issue of the JBP, Dullius et al.⁽¹⁾ present the results of their study involving a population of adult patients with invasive pneumococcal disease (IPD). Although similar studies have been conducted in populations of pediatric patients and immunosuppressed patients, there have been few such studies involving adult populations.

Among pulmonologists, the most well-known pathogenic bacterium is pneumococcus.⁽²⁾ The species *Streptococcus pneumoniae* causes localized diseases, such as otitis and sinusitis, as well as invasive diseases, such as pneumonia, meningitis, and sepsis. There are more than 90 known serotypes, which differ in terms of their aggressiveness and antibiotic resistance profile.⁽³⁾

The occurrence of IPDs among adults in Brazil has not been widely studied. Determining the serotype involved can facilitate the prevention and treatment of the disease in our patients.

Although recommendations for the treatment of pneumonia suggest that the agents involved be investigated in critically ill patients, there is as yet no recommendation for routine pneumococcal serotyping.^(3,4)

In Brazil, the antimicrobial resistance of pneumococcus has been shown to be low for penicillins, the group of antibiotics that are most widely used in the treatment of IPDs. Among younger individuals with IPD, the associated hospitalization rate has declined, as has the mortality rate. The higher rates of hospitalization and mortality among older individuals with IPD have been attributed to factors such as immunosenescence and the presence of comorbidities.^(5,6)

The study conducted by Dullius et al.,⁽¹⁾ published in this issue of the JBP, brings us the knowledge of pneumococcus in one region of Brazil (the state of Rio Grande do Sul), as well as of the serotyping of isolates from patients with IPD. A series of cultures were collected over an 11-year period, and the pneumococcal serotypes were correlated with the clinical status recorded in medical records and with the mortality rates found. The strength of their study is that it provides us with information about the pneumococcal strains present in adults with IPD, information not generally obtained in studies of patients followed at a general hospital. All of the samples were collected and cultured at the same hospital. Samples for antimicrobial susceptibility testing were sent, via the state epidemiological surveillance program, to a national referral center for pneumococcal serotyping.

Recognizing the most common serotypes and determining which serotypes are present in patients with severe pneumococcal disease could prompt suggestions

for adopting new therapies and vaccines. The cases in which the culture was positive for pneumococcus were serotyped and later compared to the data in patient charts, which were not specific to the research, those data then being tabulated.


The study could have been more informative if the data on mortality and bacterial resistance to penicillins had been related to the serotype. The most common IPD cases were those of pneumonia, with comorbidities in 85% of the cases and a mortality rate of 33%. Those are comparable to the values reported in other studies of IPD in patients categorized as being at high risk and reflect the fact that the presence of comorbidities increases the difficulty of treating these patients, even with the correct choice of antimicrobial.⁽⁷⁻⁹⁾ Some pneumococcal strains are more prone to bacterial resistance and require a differentiated approach.^(10,11)

Our knowledge about invasive strains of pneumococci comes from the microbiological surveillance of complex biological samples, such as cerebrospinal fluid and pleural fluid, as well as of blood cultures. A surveillance project on pneumonia and bacterial meningitis at the Adolfo Lutz Institute, in the city of São Paulo,⁽¹²⁾ receives such samples from regional surveillance laboratories throughout Brazil, reporting on the behavior and presentation of the most common serotypes, as well as on their bacterial resistance profiles. The series of confirmed strains has shown changes since the introduction of the pneumococcal vaccine into the national pediatric vaccination schedule. The data from this project show that, in Brazil, pneumococcal resistance to beta-lactams is low in samples collected from individuals with respiratory diseases. Data from the Information Technology Department of the Brazilian Unified Health Care System show that there has been a recent increase in the rates of hospitalization and mortality due to pneumonia in elderly patients.⁽²⁾

The use of a pneumococcal vaccine has been associated with a reduction in the incidence of IPD. Two types of anti-pneumococcal vaccines are used in adults: the pneumococcal polysaccharide vaccine (PPV) and the pneumococcal conjugate vaccine (PCV). The PPV does not result in changes in the oropharynx and does not produce the herd effect obtained with the PCVs. The PCV currently available for use in adults is the 13-valent PCV13, which covers the 13 most expected, most aggressive serotypes of pneumococci. Various studies have reported that the PPV provides good coverage for IPD in immunocompetent individuals.⁽¹³⁻¹⁶⁾ However, there is a failure of that protection in immunocompromised individuals and in

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individuals at high risk for IPD. In the at-risk patients, the PCV13 has shown good protection and reduced the incidence of IPD, as well as the number of pneumonias caused by vaccine strains and by strains not covered by the vaccine.⁽¹³⁻¹⁶⁾

The Brazilian Thoracic Association and the Brazilian Immunization Society have recommended the use of the regimen adopted internationally; that is, vaccinating patients with chronic lung diseases with PCV13 followed by the 23-valent PPV, taking age and other aggregated risk factors into account.⁽¹⁷⁻¹⁹⁾ It has become necessary to monitor changes in the serotypes found in the population in order to modify the vaccine strains and maintain the population coverage for pneumococcus.⁽²⁰⁾

In their study, Dullius et al.⁽⁴⁾ identified 35 pneumococcal serotypes; the authors theorized that, if the recommended vaccination regimen were used, the coverage would be 50.8%, because the strains

not covered by the existing vaccines accounted for 49% of the cases. The Dullius et al.⁽⁴⁾ study has the merit of indicating the importance of vaccinating our patients, with a potential reduction in the number of cases of IPD and, consequently, mortality.

There is a need for studies, conducted in settings in which patients are treated, that determine the distribution of serotypes and their sensitivity to antimicrobials, as well as evaluating the prior use of pneumococcal vaccines.

Dullius et al.⁽⁴⁾ showed that it is possible to work in collaboration with other institutions, improving treatment and increasing our knowledge of our patients. We hope that the authors will continue to pursue this line of research and will be able to provide us with more answers.

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