

**Methods:** This is a cross-sectional study conducted between 2020 and 2023 at a public hospital located in the Zona da Mata region of Minas Gerais, Brazil. Carbapenem-resistant *K. pneumoniae* strains obtained from clinical samples were analyzed. Initial species identification was performed by phenotypic methods and subsequently confirmed by mass spectrometry. Screening for carbapenem resistance was conducted by phenotypic tests, and detection of the resistance genes *blaKPC*, *blaNDM*, *blaOXA-48*, *blaIMP*, and *blaVIM* was carried out by real-time polymerase chain reaction (qPCR). The study was approved by the Human Research Ethics Committee.

**Results:** A total of 67 carbapenem-resistant clinical isolates of *K. pneumoniae* were included, 30 from the years 2020 to 2022 and 37 from 2023. Molecular analysis revealed that 56.71% (n = 38) of isolates had only the *blaKPC* gene, while 10.44% (n = 7) expressed only the *blaNDM* gene. Co-production of *blaKPC* and *blaNDM* was identified in 31.35% (n = 21) of samples, and co-production of *blaKPC* and *blaOXA-48* was detected in 1.5% (n = 1). It was observed that all co-production cases occurred in 2023, totaling 22 of the 37 isolates from that period, corresponding to 59.45% of the strains analyzed that year.

**Conclusion:** The detection of *K. pneumoniae* with co-production of carbapenemase genes demonstrates the complexity of this species' resistance profile and its clinical relevance in the dissemination of carbapenem resistance. These findings reinforce the need for more effective control strategies, the maintenance of microbiological surveillance programs, and the continuous development of studies to support targeted clinical interventions.

**Keywords:** *Klebsiella pneumoniae*, Antimicrobial Drug Resistance, Epidemiological Surveillance.

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#### CEFTAROLINE AS THERAPY OF CHOICE IN SEVERE PEDIATRIC PNEUMONIA: EVALUATION OF USE IN A LARGE TERTIARY HOSPITAL IN RECIFE-PE

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**Introduction/Objective:** Community-acquired pneumonia remains among the main causes of hospitalization and infant morbidity and mortality. The increase in resistance of *Streptococcus pneumoniae* and *Staphylococcus aureus*, including methicillin-resistant strains (MRSA), to conventional antimicrobials represents a growing clinical challenge.

Ceftaroline fosamil, a fifth-generation cephalosporin with effective action against resistant Gram-positive pathogens, has been considered a promising alternative in the management of severe respiratory infections in pediatrics. This study aimed to evaluate the clinical efficacy and safety profile of ceftaroline in pediatric patients hospitalized with pneumonia.

**Methods:** Retrospective observational study conducted in a private tertiary hospital in Recife-PE, between January 2023 and December 2024. Patients between 2 months and 17 years with a diagnosis of community-acquired pneumonia (CAP) or complicated pneumonia who received ceftaroline as part of antibiotic treatment were included. Clinical data were obtained from electronic medical records, and outcomes assessed included: clinical response at the end of treatment, need to change the antibiotic regimen, and related adverse events. Statistical analysis was descriptive, with assessment of associations between clinical variables and therapeutic success.

**Results:** 34 children were included, with a mean age of 5.3 years, 67% over 4 years old. Ceftaroline was used in 100% of cases due to failure of initial empirical therapy. About 11% of patients had comorbidities or an admission diagnosis other than pneumonia. Clinical response was observed in 83% of cases, with resolution of fever and respiratory symptoms on average after 3.9 days of treatment. Switch to oral therapy was possible in 22.2% of patients, and 77.7% did not require antibiotic escalation. No serious adverse events were recorded. One death was reported in a patient admitted in septic shock, with unfavorable evolution in less than 72 hours.

**Conclusion:** Ceftaroline showed a favorable efficacy and safety profile in the treatment of severe pneumonia in children, especially in the failure of conventional empirical regimens and in suspected resistant pathogens. The findings support its use as a relevant therapeutic option in the pediatric hospital setting, highlighting the need for prospective studies for incorporation into clinical protocols.

**Keywords:** Community-acquired pneumonia, Childhood pneumonia, Ceftaroline, *Streptococcus pneumoniae*, *Staphylococcus aureus*.

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#### CEFTAZIDIME-AVIBACTAM WITH OR WITHOUT AZTREONAM VERSUS OTHER ANTIMICROBIALS IN THE TREATMENT OF BLOODSTREAM INFECTIONS CAUSED BY CARBAPENEMASE-PRODUCING KLEBSIELLA PNEUMONIAE

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**Introduction/Objective:** Ceftazidime-avibactam (CAZAVI) has been the therapy of choice for class A carbapenemase-producing *Klebsiella pneumoniae* (KPCP), and, combined with aztreonam (ATM), for class B KPCP or co-producers (A+B). Our objective was to compare 30-day mortality in patients treated with regimens containing CAZAVI ± ATM versus other regimens, in a Brazilian hospital that recommends CAZAVI±ATM as first-line therapy for KPCP.

**Methods:** Retrospective cohort study. Eligible were adult patients who had ≥1 blood culture with KPCP, collected > 2 days after hospital admission between Jan/14 and Dec/24 and who received ≥ 2 days of adequate therapy (≥ 1 *in vitro* active antimicrobial). Two univariate analyses were performed comparing 1) CAZAVI±ATM group vs other treatments, and 2) deaths vs survival at 30 days. A Cox regression model for the primary outcome was performed including, one by one, all independent variables with  $P \leq 0.20$  in the univariate analyses.

**Results:** Excluding 79 duplicates, 172 patients were eligible, of whom 43 were excluded for absence of treatment/death ≤ 2 days, resulting in 129 analyzed: mean age = 68 ± 19 years, 73 (57%) male, and 61 (47%) were in ICU. The most common primary sites were CVC (31%), respiratory (23%), and urinary (22%). Class A, B, and A+B KPCP corresponded to 82%, 9%, and 9%, respectively. A total of 73 (57%) patients received CAZAVI±ATM (58 CAZAVI only) and 56 (43%) other treatments (79% with regimens containing polymyxins). Covariates were quite similar between the two groups. Selected for the model were: time to therapy initiation ( $P < 0.001$ ), BMI ( $P=0.17$ ), baseline eGFR ( $P=0.05$ ), and high-risk primary site ( $P=0.03$ ). Mortality was 31% ( $n=40$ ): 23.3% (17/73) in the CAZAVI±ATM group and 41.1% (23/56) in the other treatments group ( $P=0.05$ ). Variables associated with death included in the model were age ( $P=0.09$ ), Pitt score ( $P=0.01$ ), mechanical ventilation ( $P=0.09$ ), high-risk site ( $P=0.03$ ), and baseline eGFR ( $P=0.05$ ). In the final model adjusted for high-risk site ( $P=0.02$ ) and age ( $P=0.09$ ), treatment with CAZAVI±ATM was independently associated with a lower risk of 30-day death (hazard ratio 0.47; 95% CI 0.25–0.89,  $P=0.02$ ).

**Conclusion:** CAZAVI±ATM was associated with lower 30-day mortality in patients with bloodstream infection due to KPCP who had quite similar baseline characteristics.

**Keywords:** *Klebsiella pneumoniae*, Ceftazidime-avibactam, Polymyxin, Carbapenemase.

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## SCENARIO AND OBSTACLES FOR THE CONSOLIDATION OF ANTIMICROBIAL STEWARDSHIP PROGRAMS IN BRAZILIAN HOSPITALS

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**Introduction:** Antimicrobial resistance is a global threat, directly affecting Brazil. Antimicrobial Stewardship Programs (ASPs) are essential to optimize the use of antimicrobials (AMBs), reduce costs, and minimize resistance. This study describes the profile of Brazilian hospitals without ASPs, identifying challenges and opportunities.

**Methods:** This is a cross-sectional sub-analysis of the national survey conducted between October 2022 and January 2023 by the National Health Surveillance Agency (ANVISA) and partner institutions. The convenience sample included 2,073 hospitals (27.7%) from all regions of the country, of which 584 (28.1%) did not have ASPs. Variables analyzed included hospital size (small, medium, large), location (capital/interior), presence of infection control programs, microbiology laboratories, and reasons for lack of ASPs. Statistical analysis was performed using SPSS R version 28.m.

**Results:** Among the 584 hospitals without ASPs, 195 (33.4%) did not perform any actions regarding antimicrobial use. About 18% also lacked an active hospital infection control program. Of these, 30.1% had outsourced microbiology laboratories; 96% were small hospitals, and 86.7% were located in the interior. The shortage of specialized professionals was the main barrier to ASP implementation. The absence of specific actions for antimicrobial use represents a critical gap, even with national guidelines already published. The lack of structure, especially