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Analysis of the cases of infection by *Acinetobacter baumannii* in intensive care units in Alagoas between 2014 and 2018

Análise dos casos de infecção por *Acinetobacter baumannii* em Unidades de Terapia Intensiva de Alagoas entre 2014 e 2018

Análisis de casos de infección por *Acinetobacter baumannii* en Unidades de Cuidados Intensivos de Alagoas entre 2014 y 2018

Isabella de Carvalho Lemos¹ , Irena Penha Duprat¹ , Géssyca Cavalcante de Melo¹ , Janine Melo de Oliveira¹ , Maria da Piedade Gomes de Souza Maciel² 

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¹ State University of Health Sciences of Alagoas. Department of Nursing. Maceió, Alagoas, Brazil.

² CESMAC University Center. Department of Nursing. Maceió, Alagoas, Brazil.

ABSTRACT

Introduction: The infection by *Acinetobacter baumannii*, an aerobic, gram-negative, ubiquitous coccobacillus, assumes endemic proportions with notable spread in Intensive Care Units. **Aim:** To analyze the cases of *Acinetobacter baumannii* infection in Adult Intensive Care Units in Alagoas between 2014 and 2018. **Outlining:** A transversal, descriptive and retrospective research was carried out with sample of 120 patients. Data collection was carried out through a questionnaire in the documents of two public hospitals in the city of Maceió-Alagoas, one of these is a referral in emergence and the other is referral in infectious diseases. **Results:** Of the 120 patients, 80 (66.7%) were from Hospital A and 40 (33.3%) from Hospital B. There was a prevalence of males (71.7%) and of the 18 to 40 age range (49.2%) in both hospitals. The antibiotic meropenem showed a higher frequency of use. Antimicrobial resistance and sensitivity profiles were higher for cephalosporins, carbapenems, and fluoroquinolones, as well as aminoglycosides, respectively. The most frequent bacterial isolation material was the tracheal secretion associated with mechanical ventilation. The most mentioned outcome was death. **Implications:** The study exposed high rates of mortality and antimicrobial resistance, as well as evidence that can contribute to the implementation of prophylactic measures for *Acinetobacter baumannii*.

DESCRIPTORS

Bacterial Infections; Intensive Care Units; *Acinetobacter baumannii*; Epidemiology.

Corresponding author:

Isabella de Carvalho Lemos
Address: Universidade Federal do Piauí,
Campus R. Dr. Jorge de Lima, 113 - Trapiche
da Barra.
CEP: 57010-300 Maceió, Alagoas, Brasil.
Telephone: + 55 (82) 3315-6809
E-mail: isabellacarvalholemos@gmail.com

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INTRODUCTION

Healthcare-Associated Infections (HAIs) are associated with the process of care in the characteristic aspects of the opportunistic pathogens that cause them, such as ubiquitous nature, wide distribution in the environment, virulence mechanisms and antibiotic resistance. Thus, this problem can reflect on patient safety and qualified care, both in terms of prevention and control, as well as in treatment.¹

Once acquired during hospitalization, infections contribute to the indiscriminate prescription of drugs, which can favor the development of antimicrobial resistance by the microorganisms and increase costs, hospitalization time and morbidity and mortality rates.¹

Antimicrobial resistance can be related to one or multiple mechanisms, against a single agent or classes of agents. A single change can lead to resistance to several different antimicrobial agents or from the same class. The Multidrug-resistant (MDR) bacteria are resistant to at least three antimicrobials of different classes, while in the Extensively drug-resistant (XDR), the microorganism is sensitive to only one or two classes of antimicrobials. When there is proven resistance to all antimicrobials analyzed by *in vitro* susceptibility tests, the bacteria are then classified as Pandrug-resistant (PDR).²

The Intensive Care Unit is a hospital sector with a high infection risk, mainly due to the sensitive clinical condition of the patients, and, consequently, the high number of invasive procedures. In this place, the epidemiological surveillance plays the important role of presenting information on spatial and temporal localization of the microorganisms, besides of the aspects related to antimicrobial resistance, infectivity, and lethality, which are fundamental for analyzing the profile of nosocomial infection and be able to implement effective control measures, and the rational prescription of medication.²⁻⁴

Since the 1980s, bacteria of the genus *Acinetobacter* have colonized ICU patients.⁵⁻⁶ These

bacteria present coccobacillary morphology and are classified as gram-negative, aerobic, and oxidase-negative.⁷ Currently, these pathogens represent about 9.0% of HAIs, and most cases involve infections of the respiratory system.⁵⁻⁶ Unlike most species of this genus, *Acinetobacter baumannii* (*A. baumannii*) has distinct epidemiology, pathogenicity, antimicrobial resistance, and clinical impact.⁸⁻⁹

Due being diffusely found both in extra- and intra-hospital environments, and on inanimate surfaces, the bacterium *A. baumannii* becomes a frequent cause of HAIs outbreaks, potentiating the rise of new strains and making the implementation of preventive measures, as early detection, difficult.^{2,10}

The time of stay of patients infected by *A. baumannii* (both in days in the ICU and in the average duration of the entire hospital stay) can significantly increase depending on patient's clinical condition, antimicrobial resistance and on the need for intensive care. The stay in an intensive care unit is approximately 6 days and the average total hospitalization period can reach triple that time.¹¹⁻¹²

The Latin American and Caribbean Network for Antimicrobial Resistance Surveillance (ReLAVRA), established by the Pan American Health Organization (PAHO), with the aim of informing the policies, the interventions for prevention and control of antimicrobial resistance, highlighted that in 2014, of the 14,684 isolations reported in Brazil, 1,296 (8.8%) were due *A. baumannii*.¹³

The Bulletins on Patient Safety and Quality in Health Services, issued by Brazilian Health Regulatory Agency (ANVISA), evaluated national indicators of HAIs and microbial resistance to antimicrobials from the years 2017 and 2018, verifying that in adult ICU the highest antimicrobial resistance rates were observed in bacteria of the genus *Acinetobacter*, corresponding to 77.7% in 2017, and 79.0% in 2018.^{1,14}

The infection places most attributed to *A. baumannii* according to data from the SENTRY Antimicrobial Surveillance Program, referring to America, are the lower respiratory tract (17.7%),

bloodstream (7.2%), urinary tract (1.6%) and surgical site (9.9%).¹⁵

Patients under intensive care due *A. baumannii* infection present higher morbidity percentages (between 10.0% and 43.0%) than those registered in patients admitted to the hospital wards (entre 7.8% e 23.0%).¹¹ Annually, about 23,000 deaths are caused by bacteria resistant to antibiotics in Brazil, and the high mortality rates may be related to the degree of resistance to antibiotic therapy.^{1,11}

The resistance to antimicrobials of all classes, generally, is increasing and threatening patients' lives. The classes of drugs most utilized in the treatment of *A. baumannii* infections are β -lactams, aminoglycosides, tetracyclines, polymyxins, fluoroquinolones and sulfonamides.¹⁶

Gram-negative pathogens, as *Pseudomonas* and *Acinetobacter*, display the production of beta-lactamase enzymes as mechanism of resistance to beta-lactams, being the metallo-beta-lactamases one type of these enzymes. These hydrolyze the commercially available beta-lactams, except monobactam and aztreonam. They also act directly in the resistance to the carbapenem class, one of the main medications utilized in antibiotic therapy, mainly against pathogens widely resistant to antimicrobials. In addition to metallo-beta-lactamases, in the case of carbapenems, the resistance to antimicrobials may be result of factors as mechanism of efflux pumps. The formation of biofilms can favor the persistence of the bacterium and hinder the access of the antimicrobials.^{1,17-18}

According to report on antibiotic resistance threats, carried out in 2019 at the Center for Disease Control and Prevention (CDC), over 2.8 million antibiotic-resistant infections occur annually in the United States of America, and more than 35,000 people die. The report, which lists 18 bacteria and fungi into three categories (urgency, serious and worrisome) based on the level of concerning with the health, highlights the genus *Acinetobacter* resistant

to carbapenems as an urgency, pointing out the need for better screening, control of the resistance to antimicrobials, and production of new antibiotics.¹⁹

Based on this assumption, the aim of this study was to analyze the cases of *A. baumannii* infection in Adult ICUs in Alagoas between 2014 and 2018.

METHOD

A cross-sectional, descriptive, and retrospective research was carried out in two public hospitals of Maceió, Alagoas: one is a general emergency referral hospital (Hospital A), which has 18 general-use UCI beds; and a referral hospital in the treatment of infectious diseases (Hospital B), which has 7 general-use UCI beds.

Patients admitted to the ICUs of both hospitals were included, in the period from 2014 to 2018, with diagnosis of nosocomial infection by *A. baumannii*, and with the sheets of the Service of Control of Health-related Infections (SCIRAS) available in the medical record. The exclusion criteria were: sheets of patients under 18 years of age; and patient data sheet with incomplete or illegible notification of nosocomial infection.

For data collection, a semi-structured questionnaire was used, through which patients' sociodemographic information (identification number or register, sex, age, and hospital admission date) and data from SCIRAS forms (infection place, antibiotic therapy, profile for sensibility and resistance to antimicrobials, risk factors and outcome) were included. To expand the elements necessary to achieve the aims, information was also extracted from medical records of the Medical and Statistical Archive Service (SAME). Information regarding the variables gender and age were obtained from SCIRAS documents and the data referring to the variables place of infection, resistance, and sensitivity of *A. baumannii* to the main antimicrobials, risk factors and outcome came from the SAME medical records.

Data were tabulated using the Microsoft Excel(R), both for organization and for statistical analysis. The analysis was carried out using descriptive statistics and the outputs were exposed in tables and figures.

Data collection was carried out after the approval of the project in the Research Ethics Committee of State University of Health Sciences of Alagoas, under the Certificate of Presentation of Ethical Appreciation (CAAE) number 92014618.0.0000.5011, complying with all the criteria of the National Research Ethics Commission (CONEP) established by the resolution No. 510/2016.

RESULTS

In the period from 2014 to 2018, 120 patients reported with *A. baumannii* infection were identified

and, when analyzed all cases, 80 patients (66.7%) were from the Adult ICU of Hospital A and 40 (33.3%) from the ICU of B Hospital.

In 2014, 28 cases (23.3%) of *A. baumannii* infection were recorded, 20 cases in Hospital A and 8 cases in Hospital B. In 2015, there were 40 cases (33.3%), 30 in Hospital A and 10 in Hospital B. In 2016, 22 cases were identified (18.4%), 12 in Hospital A and 10 in Hospital B. In 2017 there were 18 cases (15.0%), 13 in Hospital A and 5 in Hospital B, and the year 2018 presented 12 cases (10.0%), 5 in Hospital A and 7 in Hospital B.

The distribution of patients with *A. baumannii* showed a prevalence of males, and the 18 to 40 y/o age range for both hospitals, as shown in Table 1.

Table 1 - Distribution per sex and age of patients with *Acinetobacter baumannii* in Adult Intensive Care Unit in the Hospitals A and B in the 2014 to 2018 period. Maceió, AL, Brazil. 2020.

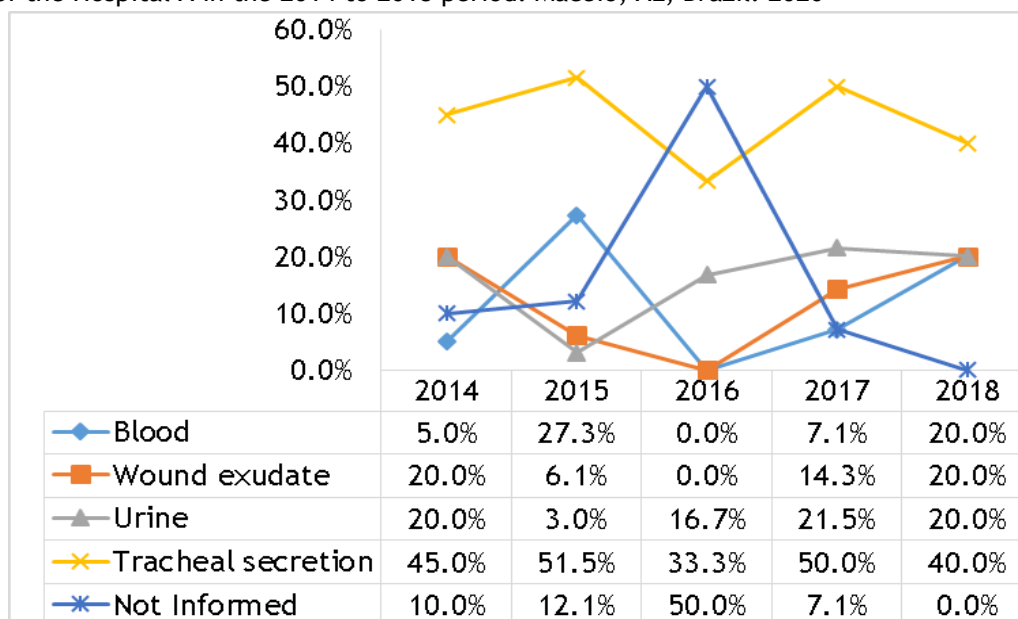
Variables	Hospital A (%)	Hospital B (%)	Total (%)
Sex			
Female	24 (30.0)	10 (25.0)	34 (28.3)
Male	56 (70.0)	30 (75.0)	86 (71.7)
Age			
18-40 y/o	41 (51.3)	18 (45.0)	59 (49.2)
41-60 y/o	22 (27.4)	16 (40.0)	38 (31.6)
Over 61	17 (21.3)	6 (15.0)	23 (19.2)

Source: Data from the research, 2020.

Between 2014 and 2018, the material with the highest incidence of *A. baumannii* identification was tracheal secretion. The biological sample of blood presented a high percentage in 2015 (27.3%) and 2018 (20.0%). Wound exudates and urine had similar

percentages in the years 2014 and 2018 (20.0%). In 2016, 50% of the files notified with *A. baumannii* infection did not contain a record of the isolation material or any other source that would allow such identification, as shown in Figure 1.

Figure 1 - Identification of the main materials for bacterial isolation of *Acinetobacter baumannii* in Adult Intensive Care Unit of the Hospital A in the 2014 to 2018 period. Maceió, AL, Brazil. 2020

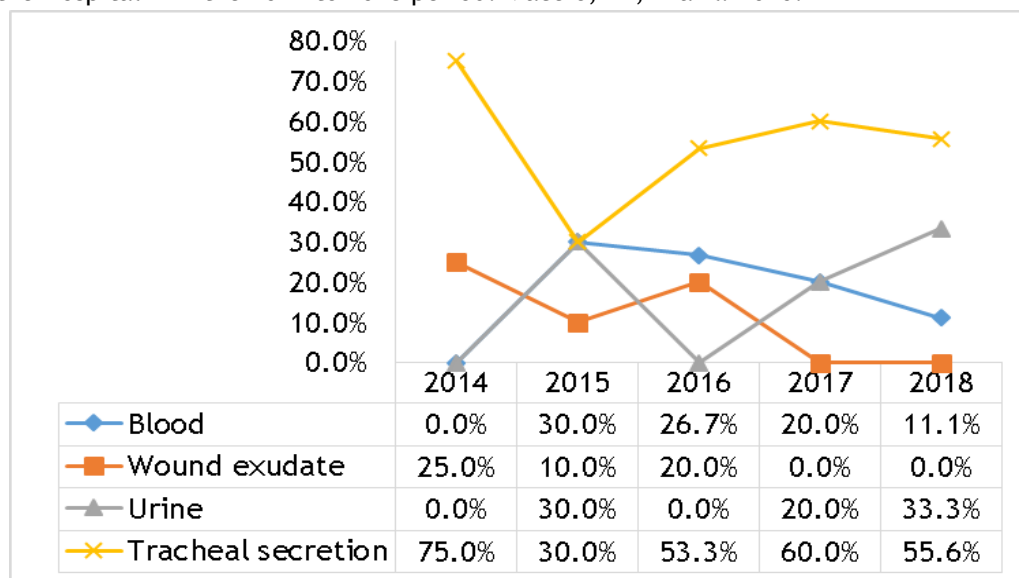


Source: Data from the research, 2020.

The material with highest incidence of identification of *A. baumannii* in the Adult Intensive Care Unit of the Hospital B was also tracheal

secretion over the analyzed period. Urine was the second most prevalent material in the years 2015 (30.0%) and 2018 (33.0%), as shown in Figure 2.

Figure 2 - Identification of the main materials for bacterial isolation of *Acinetobacter baumannii* in Adult Intensive Care Unit of the Hospital A in the 2014 to 2018 period. Maceió, AL, Brazil. 2020.

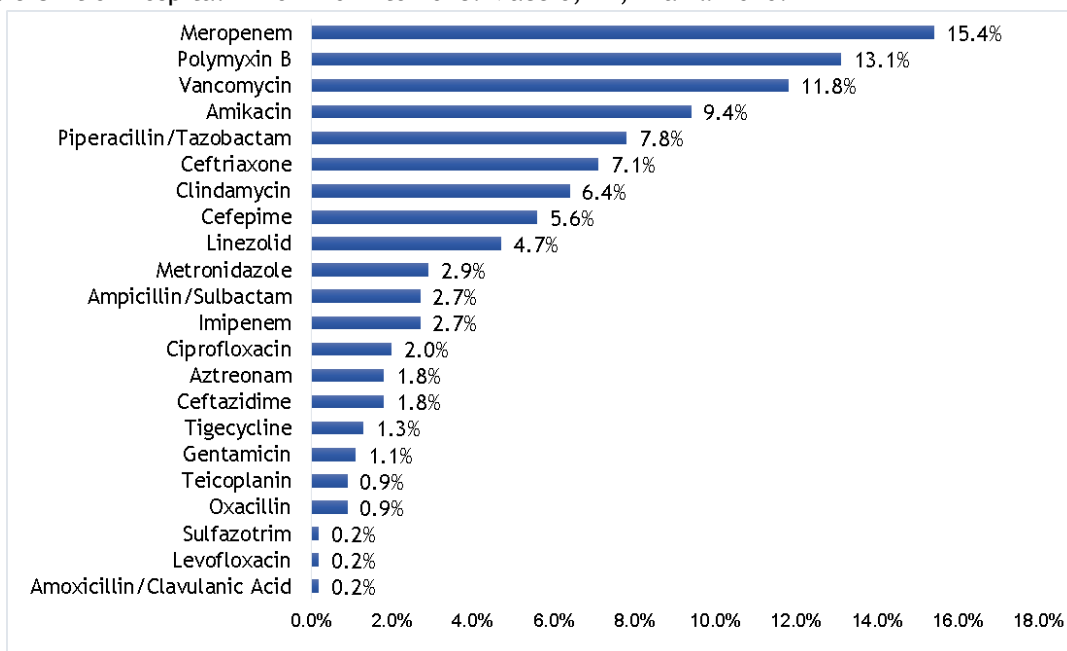


Source: Data from the research, 2020.

Figure 3 illustrates the percentage referring to antibiotics' prescription in the Adult UCI of the Hospital A. It is observed that meropenem was

prescribed 69 times (15.4%), followed by polymyxin B (13.1%) and vancomycin (11.8%), 59 and 53 times, respectively.

Figure 3 - Percentage of antibiotics prescribed in patients with *Acinetobacter baumannii* in the Adult Intensive Care Unit of Hospital A from 2014 to 2018. Maceió, AL, Brazil. 2020.

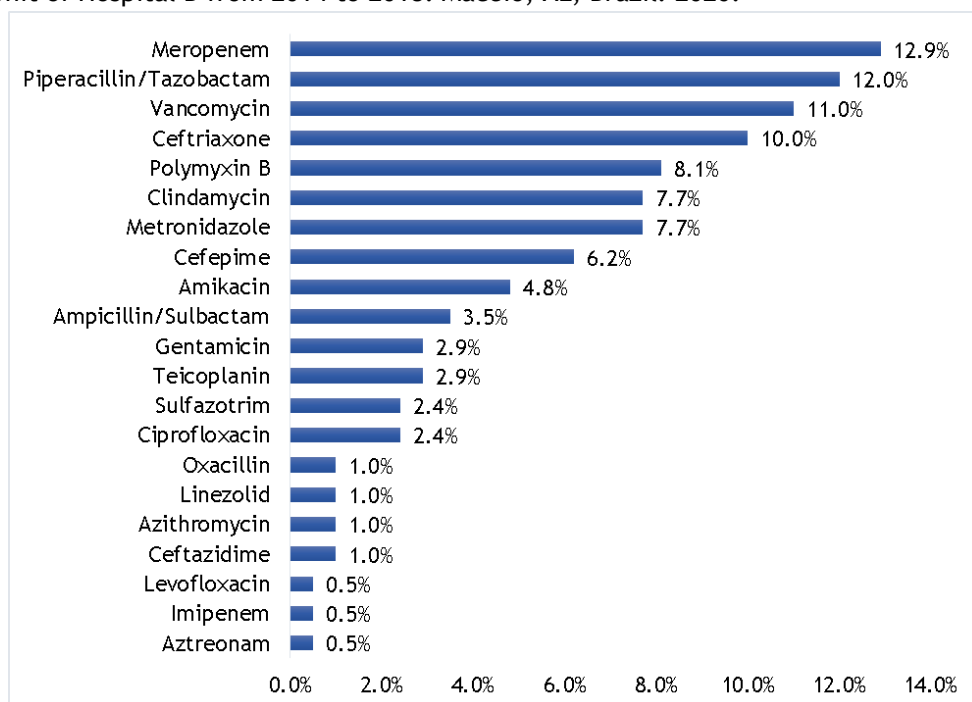


Source: Data from the research, 2020.

In Hospital B, the most prescribed antibiotics were meropenem, 27 times (12.9%), followed by the association of piperacillin/tazobactam, 25 times

(12.0%), and vancomycin, 23 times (11.0%), as shown in Figure 4.

Figure 4 - Percentage of antibiotics prescribed to patients with *Acinetobacter baumannii* in the Adult Intensive Care Unit of Hospital B from 2014 to 2018. Maceió, AL, Brazil. 2020.



Source: Data from the research, 2020.

In accordance with the positive on the bacteria culture tests, the antibiogram of the samples of the patients from Hospital A highlighted a greater sensitivity to aminoglycosides, represented by 27 samples of gentamicin (26.7%), followed by 19 samples of amikacin (18.7%). The antibiogram of the samples from Hospital B also demonstrated a greater sensibility to aminoglycosides, represented by 16 samples of gentamicin and amikacin (20.8%)

The antibiotics cefepime (9.6%), meropenem (9.6%), ciprofloxacin (8.7%) and imipenem (8.4%) were the ones which presented highest resistance rates in the samples of bacterial cultures analyzed in the patients of the Adult ICU from Hospital A, in addition to piperacillin/tazobactam (8.2%), sulfazotrim (6.7%), ceftriaxone (6.5%), ceftazidime (6.1%), levofloxacin and amikacin (5.9%), ampicillin/sulbactam (5.3%), gentamicin (4.4%), tetracycline (4.3%), cefotaxime (3.8%), aztreonam (2.3%), amoxicillin/clavulanic acid (1.1%), and norfloxacin (0.8%).

As to Hospital B, this profile was higher for cefepime (10.1%), ciprofloxacin (9.3%), ceftriaxone (8.1%) and meropenem (7.9%), in addition to ceftazidime (7.4%), ampicillin/sulbactam (7.1%), imipenem and piperacillin/tazobactam (6.9%), sulfazotrim (6.4%), levofloxacin and amikacin (5.0%), gentamicin and tetracycline (4.5%), aztreonam (3.6%), cefotaxime (3.2%), amoxicillin/clavulanic acid (2.4%), norfloxacin (1.1%), tigecycline and minocycline (0.3%).

Among the collected data, the risk factors most associated with the occurrence of infections of *A. baumannii* were attributed to the presence of Indwelling Urinary Catheter (IUC), Central Venous Catheter (CVC) and Mechanical Ventilation (MV). In Hospital A, 62 patients (72.9%) were connected to MV, 11 patients (14.1%) had IUC, and 12 patients (13.0%) had CVC. In Hospital B, 26 patients (56.6%) were connected to MV, 10 patients had IUC (21.7%), and 10 patients had CVC (21.7%).

In relation to the outcome attributed to the infection by *A. baumannii*, in Hospital A there were 41 deaths (51.3%), 28 discharges (35.0%), one transfer (1.2%) and 10 medical records (12.5%) did not report data regarding this variable. In Hospital B, there were 35 deaths (87.5%) and five discharges (12.5%).

DISCUSSION

The *Acinetobacter calcoaceticus-baumannii* complex is a group of aerobic, non-fermenting, gram-negative coccobacilli, in which, among the HAIs, the pathogen *A. baumannii* is the most clinically prevalent, with a high rate in ICUs. Invasive procedures performed in critically ill patients undergoing intensive care, for example, can contribute not only to the spread, but mainly to the establishment of infections by these microorganisms.¹²

This study analyzed cases of *A. baumannii* infection in adult ICUs, identifying high rates of infection, antimicrobial resistance and death, as well as verified the need for alternatives for treatment and prevention measures.

The year 2015 stood out among the years analyzed in this research due the high percentage of notified cases of *A. baumannii* infection (62.5%) in the two hospitals of Maceió. In a tertiary hospital in the city of João Pessoa, in the same year, a research that analyzed the prevalence, the microbiological profile, and the sensitivity to non-fermenting gram-negative bacilli was carried out, pointing out that the rate of infection by *A. baumannii* was the third highest in the general ICUs, however, detected in only 6.8% of the cases.²⁰ This data disparity in relation to the 2015 numbers was also noticed in another study that verified the occurrence and bacterial profile in patients admitted to the ICU of the university hospital in Petrolina, in the state of Pernambuco. Although the infection rate by *A. baumannii* was also the highest among the causative pathogens, this percentage was 3 times lower (20.3%) in relation to the aforementioned year.²¹

Both the results of the study carried out in state of Paraíba²⁰ and the one in the state of Pernambuco²¹ showed high rates of infection by *A. baumannii* in the analyzed ICUs, however, the percentages were lower than in this study. The difference between the percentages may be related to the sample size and the number of positive cultures for this bacterium in each study.

Regarding the variables sex and age of the studied sample, it was observed that 71.7% of the patients were male and the 18 to 40 years (49.2%) age range predominated. The rates of multidrug-resistant *A. baumannii* infections were also higher in male patients (61.5%) in a study carried out at a municipal hospital in Uberlândia, Minas Gerais,²² however discordant as to the age range, which was higher between 61 and 80 years (40.7%). Another research, which traced the profile and the prevalence of antimicrobial resistance of isolated, gram-negative bacteria of patients from an ICU in Goiânia, found results like the ones in the study in Minas Gerais, presenting prevalence of infections in the 60 to 79 age range.²³ However, in this last study, the prevalence of cases was higher in female patients.

The prevalence of infections in male patients is still poorly evidenced, however, a study that analyzed the profile of the health situation of men in Brazil showed that young men are more likely to be hospitalized due to external causes, such as trauma/injuries, in addition to comorbidities, although the latter are reported to be more frequent at older ages.^{22,24} Thus, with a high number of male hospitalizations, this group becomes more exposed and susceptibility to HAIs increases, which may justify the data found in the present study, including the care profile of one of the hospitals that is emergency reference in the state.

The infection by *A. baumannii* in the hospital environment, especially in ICUs, can be facilitated by invasive and noninvasive procedures, such as MV, CVC and IUC, constituting the main risk factors.²⁵ The most frequent risk factors in the Hospitals A and B

were MV (72.9%/56.6%), IUC (14.1%/21.7%) and CVC (13.0%/21.7%), similarly to the study which described the epidemiological profile of HAIs in the Adult ICU of a public hospital in Belém/PA, which pointed out CVC (43.9%), MV (36.6%) and IUC (19.5%) as the most prevalent risk factors.²⁶

The hydrophobic capability of *A. baumannii* to promote fixation to materials such as plastics used in intravascular devices; latex, polyurethane or silicone of the urinary catheter; and the ventilatory support, comes from the ability of this bacterium to form biofilms, which may explain the high percentages involving the risk factors.^{12,26} For this reason, it is essential the planning, implementation and evaluation of programs and protocols that aim to reduce the risk of infections associated with the use of these equipment and procedures.

The infections such as ventilator-associated pneumonia, central venous catheter-associated infection and catheter-associated urinary tract infection are often attributed to the microorganism *A. baumannii*, e os principais materiais isolados de infecção pesquisados correspondem a secreção traqueal, sangue e urina.²² Por esta razão, na suspeita de infecção, deve-se realizar cultura de amostras biológicas para detecção precoce e implementação de uma terapêutica adequada.

In the two ICUs under study, the prevalent material of identification of *A. baumannii* was the tracheal secretion (44.0% e 54.8%), as well as in the study carried out in the ICU of the university hospital in Petrolina, which presented a 27.0% prevalence of *A. baumannii* in samples of tracheal secretion (27.0%).²¹

The Orotracheal Intubation (OI) hinders glottal closure. The airway cleaning mechanism is compromised, hampering cough reflex. With intubation, the production of secretions increases, which makes the scenario favorable to infections, which may justify the tracheal secretion prevailing as to the place of infection in this study. Thus, critically ill patients undergoing intubation may have high rates

of ventilator-associated pneumonia (VAP). The collection of the endotracheal aspirate, essential to maintain the airways pervious and avoid microbial proliferation, and oral hygiene with antiseptics are examples of procedures that must be implemented in the care routine.²²

Blood samples rank second as to the materials of identification of *A. baumannii* (11.8% in the Hospital A and 17.6% in the Hospital B), as in a study²³ conducted in the ICU of a hospital in Goiania, Goiás, in which *A. Baumannii* was detected in 10.8% of the blood samples.

The samples of urine from the Hospital A (16.2%) and from the Hospital B (16.6%), as well as wound exudate (12.1% and 11.0%), respectively, showed lower percentages when compared to other isolation materials, like the study that demonstrated the urine (8.4%) and the wound exudate (6.9%) with the lowest percentages of isolation of *A. baumannii* from samples of ICU patients.²⁷

In relation to the antibiotic therapy for the *A. baumannii*, the carbapenems are the drugs widely used for treatment, in addition to third and fourth generation cephalosporins, polymyxins B and E, tetracyclines and fluoroquinolones, provided that the isolates are susceptible.²⁸

The most used antibiotics at Hospital A were meropenem (15.4%), polymyxin B (13.1%) and vancomycin (11.8%), while at Hospital B they were meropenem (12.9%), piperacillin/tazobactam (12.0%) and vancomycin (11.0%), keeping certain similarity with a study performed in an Adult ICU of a referral hospital in Maranhão, which described the profiles of the main antibiotics prescribed and pointed out vancomycin (16.7%), meropenem (7.8%), piperacillin/tazobactam (5.7%) and polymyxin B (1.7%) as some of the most used.²⁹ Such results confirm that polymyxin B, vancomycin and carbapenems, as meropenem, are the agents of first choice in the treatment, considering the sensitivity profile.²⁸

In ICUs, bacterial resistance to antimicrobials has represented a challenge and a serious public health problem, raising treatment costs, prolonged hospitalization and increasing morbidity and mortality rates.²³ One of the main factors responsible for the persistence of *A. baumannii* in the hospital environment is drug resistance due to the indiscriminate use of antibiotics.¹² Therefore, the profile of sensitivity and resistance to antimicrobials of the microorganism must be known, through surveillance culture, to provide the rational use of medication, the readjustment of therapy according to results of the tests, such the antibiogram, in addition to the development and use of restrictive protocols, in order to promote patient safety and qualified care.

Considering the antibiotic sensitivity profile and the results of positive cultures in the present study, the antibiogram of the samples from hospitals A and B demonstrated greater sensitivity to gentamicin (26.7%/20.8%), amikacin (18.7%/20.8%) and ampicillin/sulbactam (14.9%/11.6%), but both with low sensitivity to polymyxin B (4.0% and 2.6%, respectively).

These data reinforce the findings of a study performed in the city of Ribeirão Preto, São Paulo, which evaluated the frequency and antimicrobial sensitivity profile of *A. baumannii*, *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* of bacterial isolates from clinical samples of patients in a university hospital, demonstrating a sensitivity greater than 50.0% for aminoglycosides (gentamicin and amikacin) and 39.0% for ampicillin/sulbactam. However, it was discordant regarding polymyxin, which presented a 99.0% sensitivity. The disagreement as to the sensibility of polymyxin may be related to the profile of the study institution concerning the prescription of medication to promote the rational use, and to patient's medication use records.³⁰

The antibiotic resistance profile from the antibiogram of positive culture samples showed greater resistance to cefepime and meropenem

(9.6%), to ciprofloxacin (8.7%), to imipenem (8.4%) and to piperacillin/tazobactam (8.2%) at Hospital A, while at Hospital B, the most resistant were cefepime (10.1%), ciprofloxacin (9.3%), ceftriaxone (8.1%), meropenem (7.9%) and ceftazidime (7.4%). This profile was similar, in relation to the classes, to that found in a study performed in the ICU of the hospital in Uberlândia.²²

The percentages of antimicrobial resistance in the current research did not exceed 11.0%, unlike the study carried out in Minas Gerais, which displayed the highest percentages in piperacillin/tazobactam (80.5%), imipenem (78.8%), cefepime and ampicillin/sulbactam (78.7%), ceftazidime (78.5%), meropenem (78.4%), ciprofloxacin (78, 6%) and ceftriaxone (77.8%). This difference may be related to the frequency of antibiotic use, the clinical profile of the patients and the size of the population of the study.

This study showed a high percentage of resistance to one of the most used drug classes in the treatment of resistant bacteria, the carbapenems. The synergy of antibiotics in therapy is the object of study in research that evaluate the effectiveness of these combinations, such as the association between polymyxins and carbapenems.³¹ This reveals the need for more research aimed at the control, surveillance, screening for *A. baumannii* strains, production of new antibiotics and alternatives for treatment.

The outcome death was observed in 63.3% of the total analyzed cases. Separately, deaths in Hospital A (51.3%) and Hospital B (87.5%) presented higher percentages than hospital discharges (35.0% and 12.5%, respectively). The values found are above the average described in the international literature (43.0%),³² and below the Brazilian average (77.2%) found in a study that determined the epidemiological characteristics and antimicrobial sensitivity among carbapenem-resistant non-fermenting bacteria in Brazil.³³

The high mortality rates in this study may be related to immunosuppression factors, since Hospital

A is a reference in urgent and emergency care, especially clinical emergencies and traumatology, and Hospital B is a reference in the care of infectious diseases. Comorbidities and the immunological status of patients, for example, were not addressed in the study, but may have contributed to the prevalence of deaths.

The main limitations in this study refer to the absence of some data that could be related to the cases of *A. baumannii* infection, for instance, the total number of patients admitted to the ICUs during the period evaluated, which was not obtained because the data collection was directed to the documents of patients identified as infected by *A. baumannii*. Although the number of deaths in both analyzed sites was high, factors such as comorbidities and immunological conditions, for example, were not investigated and may be directly related to the high mortality rates identified, constituting another limitation.

CONCLUSION

A high prevalence of *A. baumannii* infection was identified in Adult ICUs in Maceió-Alagoas, displaying a resistant profile and a high mortality rate in health services. The indiscriminate use of antibiotics was also evidenced, demonstrating that the intensification or implementation of restrictive measures are essential to regulate antibiotic therapy according to the sensitivity and resistance profile to antimicrobials in health institutions.

The findings of this research provide relevant data that can contribute to the implementation of prophylactic measures for *A. baumannii* infection, such as the implementation of institutional protocols for monitoring indicators and reporting data, as well as the intensification of existing measures, essential for the reduction of infection rates.

RESUMO

Introdução: A infecção por *Acinetobacter baumannii*, um cocobacilo aeróbio, gram-negativo e ubiqüitário, assume proporções endêmicas com notável abrangência nas Unidades de Terapia Intensiva. **Objetivo:** Analisar os casos de infecção por *Acinetobacter baumannii* em Unidades de Terapia Intensiva Adulto de Alagoas entre 2014 e 2018. **Delineamento:** Foi conduzida uma pesquisa descritiva, transversal, retrospectiva e quantitativa, com amostra de 120 pacientes. A coleta de dados foi realizada por meio de um questionário nos documentos de dois hospitais públicos da cidade de Maceió-Alagoas, sendo que um destes é referência em emergências e o outro é referência em doenças infectocontagiosas. **Resultados:** Dos 120 pacientes, 80 (66,7%) eram do Hospital A e 40 (33,3%) do Hospital B. Houve prevalência do sexo masculino (71,7%) e da faixa etária entre 18 a 40 anos de idade (49,2%) em ambos os hospitais. O antibiótico meropenem apresentou uma maior frequência de uso. Os perfis de resistência e sensibilidade aos antimicrobianos foram maiores em cefalosporinas, carbapenemas e fluorquinolonas, bem como aminoglicosídeos, respectivamente. O material de isolamento mais frequente foi secreção traqueal associado à ventilação mecânica. O desfecho mais referido foi óbito. **Implicações:** O estudo expôs elevadas taxas de mortalidade e resistência a antimicrobianos, bem como evidências que podem contribuir na implementação de medidas profiláticas para *Acinetobacter baumannii*.

DESCRIPTORES

Infecções Bacterianas; Unidades de Terapia Intensiva; *Acinetobacter baumannii*; Epidemiologia.

RESUMEN

Introducción: La infección por *Acinetobacter baumannii*, un cocobacilo aerobio, gramnegativo y ubicuo, asume proporciones endémicas con notable cobertura en las Unidades de Cuidados Intensivos. **Objetivo:** Analizar los casos de infección por *Acinetobacter baumannii* en las Unidades de Cuidados Intensivos de Adultos de Alagoas entre 2014 y 2018. **Delineación:** Se realizó una investigación descriptiva, transversal, retrospectiva y cuantitativa con una muestra de 120 pacientes. La recolección de datos se realizó a través de un cuestionario en los documentos de dos hospitales públicos de la ciudad de Maceió-Alagoas, uno de los cuales es referencia en emergencias y el otro es referencia en enfermedades infectocontagiosas. **Resultados:** De los 120 pacientes, 80 (66,7%) eran del Hospital A y 40 (33,3%) del Hospital B. Predominó el sexo masculino (71,7%) y el grupo etario entre 18 y 40 años de edad (49,2%) en ambos hospitales. El antibiótico meropenem mostró una mayor frecuencia de uso. Los perfiles de resistencia y sensibilidad a los antimicrobianos fueron más altos para las cefalosporinas, los carbapenémicos y las fluoroquinolonas, así como para los aminoglucósidos, respectivamente. El material de aislamiento más frecuente fue la secreción traqueal asociada a ventilación mecánica. El resultado más informado fue la muerte. **Implicaciones:** El estudio expuso altas tasas de mortalidad y resistencia antimicrobiana, así como evidencia que puede contribuir a la implementación de medidas profiláticas para *Acinetobacter baumannii*.

DESCRIPTORES

Infecciones Bacterianas; Unidades de Cuidados Intensivos; *Acinetobacter baumannii*; Epidemiología.

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ICL e IPD: contributed to the conception, data collection, analysis and interpretation, and article's writing. MPGSM: contributed to the initial conception of the research project, writing of the research, and article's critical review. JMO e GCM: contributed to the writing, and article's critical review. **All authors agree and are responsible for the content of this version of the manuscript to be published.**

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CONFLICTS OF INTEREST

There are no conflicts of interest to declare.