

ASSESSING THE BURDEN OF BURKHOLDERIA CEPACIA COMPLEX IN ICU PATIENTS: IMPLICATIONS FOR ANTIMICROBIAL STEWARDSHIP

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ABSTRACT

Background: Burkholderia cepacia complex (Bcc) is an opportunistic, non-fermenting gram-negative bacillus increasingly recognized as an important healthcare-associated pathogen in critically ill patients. Its ability to survive in hospital environments, intrinsic resistance to multiple antimicrobials, and association with prolonged hospital stay make it a significant concern in intensive care units (ICUs). Limited data are available regarding the burden and antimicrobial susceptibility profile of Bcc among adult ICU patients in tertiary care settings of Bihar, India. Understanding its prevalence and resistance pattern is essential for guiding infection control strategies and antimicrobial stewardship practices.

Aim: To assess the burden of Burkholderia cepacia complex among ICU patients and to evaluate its antimicrobial susceptibility profile, with special reference to its implications for antimicrobial stewardship.

Materials and Methods: A hospital-based cross-sectional study was conducted among 312 adult patients admitted to the ICU of a selected tertiary care hospital in Bihar. Patients above 18 years of age undergoing microbiological analysis of body fluid samples were included. Samples such as blood, urine, sputum, cerebrospinal fluid, ascitic fluid, and other body fluids were collected according to standard operating procedures and processed in the microbiology laboratory. Identification of microorganisms and antimicrobial susceptibility testing were performed using the automated VITEK 2 Compact 30 system. Data were analyzed using SPSS and MS Excel. Categorical variables were expressed as frequency and percentage, and appropriate statistical tests were applied, with $p < 0.05$ considered statistically significant.

Results: Among the 312 ICU patients, the majority belonged to the 31–50 years age group (39.74%), and males constituted 61.54% of the study population. Most patients were admitted to the Medical ICU (57.05%), and 65.38% had associated comorbidities. Blood samples formed the largest proportion of specimens (32.69%), while culture positivity was highest in sputum samples (55.56%). The overall prevalence of Bcc infection was 3.53% (11/312). Among Bcc-positive isolates, sputum was the most common source (36.36%), followed by blood (27.27%) and urine (18.18%). Presence of comorbidities showed a statistically significant association with Bcc infection ($p = 0.048$). Trimethoprim-sulfamethoxazole showed the highest sensitivity (81.82%), followed by levofloxacin (72.73%). Bcc-positive patients had a significantly longer ICU stay than Bcc-negative patients (12.40 ± 3.20 vs 8.60 ± 2.75 days; $p = 0.031$).

Conclusion: Burkholderia cepacia complex represented a clinically important opportunistic pathogen in ICU patients, particularly among those with comorbidities. Its association with prolonged ICU stay and variable antimicrobial susceptibility highlights the need for early detection, susceptibility-guided therapy, strict infection control measures, and strengthened antimicrobial stewardship in critical care settings.

KEYWORDS: Burkholderia cepacia complex; Intensive care unit; Antimicrobial susceptibility; Healthcare-associated infection; Antimicrobial stewardship

INTRODUCTION

Burkholderia cepacia complex (Bcc) is a group of closely related, aerobic, non-fermenting, gram-negative bacilli that has emerged as an important opportunistic pathogen in modern hospital practice. Although it is widely recognized for its association with cystic fibrosis, Bcc is increasingly being reported among non-cystic fibrosis patients, particularly those who are critically ill, immunocompromised, mechanically ventilated, or exposed to prolonged hospitalization and invasive procedures. Its clinical importance lies not only in its ability to cause bloodstream, respiratory, urinary tract, and deep-seated infections, but also in its remarkable capacity to

survive in moist hospital environments, medical devices, disinfectants, and pharmaceutical products. This environmental persistence gives Bcc a unique epidemiological advantage in healthcare settings and makes it a relevant pathogen for infection prevention and antimicrobial stewardship programs.¹ In intensive care units (ICUs), the risk posed by Bcc is particularly significant. ICU patients often have multiple predisposing factors such as central venous catheterization, urinary catheterization, endotracheal intubation, ventilator support, repeated suctioning, broad-spectrum antibiotic exposure, and underlying comorbid illnesses. These conditions create an ideal environment for the acquisition and persistence of opportunistic gram-negative organisms. Recent reports from tertiary care settings have shown that Bcc infections in adults without cystic fibrosis are seen predominantly in middle-aged to elderly patients with chronic illnesses and prior critical care exposure. In such populations, Bcc has been linked to respiratory infections, bacteremia, urinary infections, and other extrapulmonary infections, thereby widening its clinical relevance beyond traditional risk groups.² Another major concern surrounding Bcc is its strong association with healthcare-associated outbreaks. Unlike many other opportunistic pathogens, Bcc is repeatedly implicated in pseudo-outbreaks and true outbreaks caused by contamination of antiseptics, disinfectants, gels, mouthwash solutions, water sources, ventilator-associated equipment, and other hospital-use products. Recent investigations from different countries have demonstrated that contaminated chlorhexidine-based preparations, nonsterile multiuse ultrasound gel, ice and water from hospital ice machines, and other moist reservoirs can serve as unsuspected sources of transmission. Such outbreaks are often difficult to recognize early because Bcc may initially appear as sporadic isolates unless microbiological surveillance and epidemiological linkage are actively pursued. This capacity for environmental survival and product-related spread makes Bcc a pathogen of special concern in ICU settings where vulnerable patients are clustered together.³ The microbiological and therapeutic challenges posed by Bcc further increase its clinical significance. Bcc is intrinsically resistant to several commonly used antimicrobial agents and can additionally acquire resistance through multiple mechanisms, including reduced membrane permeability, efflux systems, chromosomal beta-lactamases, and other adaptive strategies. This results in limited therapeutic options and variable susceptibility profiles across institutions and geographic regions. Recent studies from India and other healthcare settings have shown considerable heterogeneity in susceptibility to agents such as ceftazidime, meropenem, trimethoprim-sulfamethoxazole, levofloxacin, and minocycline. Such variability indicates that empirical treatment of Bcc infection is often difficult and that local susceptibility surveillance is essential for appropriate antibiotic selection. Accurate laboratory identification and susceptibility testing therefore play a crucial role in both patient management and antimicrobial stewardship.⁴ From an antimicrobial stewardship perspective, Bcc represents a pathogen that can silently amplify inappropriate antibiotic use. In ICUs, broad-spectrum antimicrobials are frequently started empirically in severely ill patients, but the presence of organisms such as Bcc, which are naturally resistant to many first-line and reserve drugs, can lead to repeated escalation, prolonged combination therapy, and increased selective pressure on the hospital microbiota. If Bcc isolates are not correctly identified, they may be mistaken for other non-fermenters, leading to suboptimal therapy and delayed de-escalation. Conversely, understanding the prevalence of Bcc and its local susceptibility pattern can help clinicians choose more rational therapy, avoid unnecessary exposure to ineffective agents, reduce treatment failure, and support targeted stewardship interventions in the ICU. Thus, surveillance of Bcc is not merely a microbiological exercise; it has direct implications for antibiotic policy, infection control, and patient outcomes.⁵ The burden of Bcc in many Indian hospital settings remains insufficiently characterized, especially in adult ICU populations where data are limited and often derived from outbreak investigations rather than systematic observational studies. This creates an important knowledge gap because the local prevalence, sample-wise distribution, associated clinical factors, and antimicrobial susceptibility pattern of Bcc may differ substantially across centers depending on antibiotic practices, infection control measures, diagnostic facilities, and patient case-mix. In a resource-constrained and high-burden critical care environment, such information is essential for planning stewardship strategies and strengthening microbiological surveillance.⁶ Against this background, the present study was undertaken to assess the burden of *Burkholderia cepacia* complex among ICU patients in a tertiary care hospital in Bihar and to evaluate its antimicrobial susceptibility profile, with the broader aim of informing more evidence-based antimicrobial stewardship practices in critical care.

MATERIALS AND METHODS

This study was conducted using a hospital-based cross-sectional design to determine the prevalence of *Burkholderia cepacia* complex (Bcc) and to characterize its antimicrobial susceptibility profile among ICU patients. The study was carried out in the Intensive Care Unit (ICU) of a selected tertiary care hospital in Bihar. Microbiological analysis was performed in the microbiology laboratory on specimens submitted for routine diagnostic testing. The study was undertaken in accordance with the DHR-STs (2025) project guidelines.

Eligibility Criteria

The study population consisted of adult patients aged more than 18 years who were admitted to the ICU of the selected tertiary care hospital and underwent microbiological analysis of body fluid samples. Patients of all genders with any suspected infection were included. Since the representative proportion of ICU patients with *Burkholderia cepacia* complex infection was unknown, the prevalence (p) was assumed to be 3% based on previous literature. 312 patients were included in this study. Inclusion criteria comprised adult ICU patients

above 18 years of age, samples of all types of body fluids including blood, urine, ascitic fluid, and others with a minimum volume of 2 mL, and patients with no recent history of antibiotic therapy. Patients who had received prior antibiotic therapy before sample collection, pediatric patients below 18 years of age, stool samples, pus or other body fluids collected using swabs or from endotracheal tubes, and samples stored for more than 24 hours before analysis were excluded from the study.

METHODOLOGY

Samples were collected from eligible adult ICU patients according to standard operating procedures. Blood samples were aseptically collected by standard venipuncture after proper disinfection of the puncture site, inoculated into adult blood culture bottles, and promptly sent to the microbiology laboratory for processing. Urine samples were collected by the midstream clean-catch method after cleansing the urethral area and were transported to the laboratory within 2 hours; when delay was anticipated, the samples were refrigerated at 4°C. In patients unable to provide a midstream urine sample due to immobility or injury, urine was collected from the sampling port of an indwelling catheter using sterile technique. Cerebrospinal fluid (CSF) samples were collected by lumbar puncture under aseptic conditions, with approximately 1–10 mL collected and sent immediately to the laboratory. Sputum samples of at least 5 mL, excluding saliva, were collected in sterile containers, preferably in the early morning, with the help of nebulized saline or suction, and were transported within 2 hours. Ascitic fluid was collected by abdominal paracentesis using sterile technique, while other body fluids, pus, and aspirates were obtained by aspiration and transferred into sterile containers. All samples were transported from the ICU to the microbiology laboratory as early as possible while maintaining the cold chain, except CSF specimens, which were transported at room temperature (20°C to 25°C). When required, samples were stored in the microbiology laboratory for not more than 24 hours at 2–8°C before processing, whereas CSF samples were stored at room temperature.

Sample Processing and Data Analysis

All collected specimens were processed using standard microbiological protocols. Identification of microorganisms and antimicrobial susceptibility testing were performed using the automated VITEK 2 Compact 30 system. For statistical analysis, categorical variables were expressed as numbers and percentages, while continuous variables were presented as mean $\pm$ standard deviation. Categorical variables were compared using the Chi-square test or Fisher's exact test, as appropriate. A p-value of less than 0.05 was considered statistically significant. All statistical analyses were performed using the Statistical Package for Social Sciences (SPSS) in MS Excel.

RESULTS

Table 1: Demographic and Clinical Characteristics

A total of 312 ICU patients were included in the study. The majority of patients belonged to the 31–50 years age group (39.74%), followed by 51–70 years (27.56%), 18–30 years (21.79%), and those above 70 years (10.90%). This indicates that middle-aged adults constituted the largest proportion of ICU admissions. In terms of gender distribution, males predominated (61.54%) compared to females (38.46%), suggesting a higher ICU admission rate among males. Regarding the type of ICU admission, most patients were admitted to the Medical ICU (57.05%), while 42.95% were admitted to the Surgical ICU. A significant proportion of patients (65.38%) had underlying comorbidities, whereas 34.62% had no associated comorbid conditions, highlighting the high burden of chronic illnesses among critically ill patients.

Table 2: Distribution of Clinical Samples and Culture Positivity

Among the 312 samples analyzed, blood samples constituted the largest proportion (32.69%), followed by urine (28.21%), sputum (17.31%), ascitic fluid (8.33%), CSF (7.05%), and other samples (6.41%). Culture positivity was highest in sputum samples (55.56%), indicating a higher likelihood of detecting pathogens in respiratory specimens. Urine samples also showed a relatively high positivity rate (47.73%), followed by other samples (40.00%), ascitic fluid (38.46%), and blood (37.25%). CSF samples demonstrated the lowest culture positivity (27.27%).

Table 3: Prevalence and Sample-wise Distribution of Bcc Isolates

The overall prevalence of *Burkholderia cepacia* complex (Bcc) infection in the study population was 3.53% (11 out of 312 patients). Among the Bcc-positive cases, the highest isolation was observed from sputum samples (36.36%), followed by blood (27.27%) and urine (18.18%). CSF and ascitic fluid each accounted for 9.09% of the isolates.

Table 4: Association of Bcc Infection with Clinical Variables

The association between Bcc infection and various clinical variables was analyzed. No statistically significant association was observed between Bcc infection and age group ($p = 0.421$), indicating that infection was distributed across all age groups without a specific predilection. Similarly, gender was not significantly associated with Bcc infection ($p = 0.637$), suggesting comparable susceptibility among males and females. The

type of ICU admission (medical vs surgical) also did not show a significant association ($p = 0.312$). However, the presence of comorbidities was found to be significantly associated with Bcc infection ($p = 0.048$). A markedly higher proportion of Bcc-positive patients had comorbid conditions (90.91%) compared to Bcc-negative patients (64.45%), indicating that underlying diseases may increase the risk of acquiring Bcc infection in ICU settings.

Table 5: Antimicrobial Susceptibility Pattern of Bcc Isolates

The antimicrobial susceptibility pattern of Bcc isolates revealed varying degrees of sensitivity and resistance. The highest sensitivity was observed for trimethoprim-sulfamethoxazole (81.82%), followed by levofloxacin (72.73%), ceftazidime and minocycline (63.64% each), and meropenem (54.55%). Piperacillin-tazobactam showed the lowest sensitivity (45.45%). Resistance was highest against meropenem and piperacillin-tazobactam (36.36% each), followed by ceftazidime and minocycline (27.27%), and levofloxacin and trimethoprim-sulfamethoxazole (18.18% each). A small proportion of isolates demonstrated intermediate susceptibility to certain antibiotics.

Table 6: ICU Outcomes of Bcc Patients

The clinical outcomes of patients with Bcc infection were compared with those without infection. Among Bcc-positive patients, 63.64% were discharged, while 36.36% died during ICU stay. In comparison, the mortality rate among Bcc-negative patients was lower (20.27%). Although mortality was higher in Bcc-positive patients, the difference was not statistically significant ($p = 0.182$). However, the mean duration of ICU stay was significantly longer in Bcc-positive patients (12.40 ± 3.20 days) compared to Bcc-negative patients (8.60 ± 2.75 days), with a statistically significant difference ($p = 0.031$).

Table 1: Demographic and Clinical Characteristics of Study Participants (n = 312)

Variable	Frequency (n)	Percentage (%)
Age Group (years)		
18–30	68	21.79
31–50	124	39.74
51–70	86	27.56
>70	34	10.90
Gender		
Male	192	61.54
Female	120	38.46
Type of Admission		
Medical ICU	178	57.05
Surgical ICU	134	42.95
Presence of Comorbidities		
Yes	204	65.38
No	108	34.62

Table 2: Distribution of Clinical Samples and Culture Positivity (n = 312)

Sample Type	Total Samples n (%)	Culture Positive n (%)	Culture Negative n (%)
Blood	102 (32.69)	38 (37.25)	64 (62.75)
Urine	88 (28.21)	42 (47.73)	46 (52.27)
Sputum	54 (17.31)	30 (55.56)	24 (44.44)
CSF	22 (7.05)	6 (27.27)	16 (72.73)
Ascitic Fluid	26 (8.33)	10 (38.46)	16 (61.54)
Others	20 (6.41)	8 (40.00)	12 (60.00)

Table 3: Prevalence and Sample-wise Distribution of Bcc Isolates

Parameter	Frequency (n)	Percentage (%)
Overall Bcc Positive	11	3.53
Sample-wise Bcc Isolation		
Blood	3	27.27
Urine	2	18.18
Sputum	4	36.36
CSF	1	9.09
Ascitic Fluid	1	9.09

Table. 4: Association of Bcc Infection with Clinical Variables

Variable	Bcc Positive (n=11)	Bcc Negative (n=301)	p-value
Age Group			0.421
18–30	2 (18.18)	66 (21.93)	
31–50	5 (45.45)	119 (39.53)	
51–70	3 (27.27)	83 (27.57)	
>70	1 (9.09)	33 (10.96)	
Gender			0.637
Male	7 (63.64)	185 (61.46)	
Female	4 (36.36)	116 (38.54)	
Comorbidities			0.048*
Yes	10 (90.91)	194 (64.45)	
No	1 (9.09)	107 (35.55)	
ICU Type			0.312
Medical ICU	8 (72.73)	170 (56.48)	
Surgical ICU	3 (27.27)	131 (43.52)	

*Statistically significant

Table. 5: Antimicrobial Susceptibility Pattern of Bcc Isolates (n = 11)

Antibiotic	Sensitive n (%)	Intermediate n (%)	Resistant n (%)
Ceftazidime	7 (63.64)	1 (9.09)	3 (27.27)
Meropenem	6 (54.55)	1 (9.09)	4 (36.36)
Levofloxacin	8 (72.73)	1 (9.09)	2 (18.18)
Trimethoprim-Sulfamethoxazole	9 (81.82)	0 (0.00)	2 (18.18)
Piperacillin-Tazobactam	5 (45.45)	2 (18.18)	4 (36.36)
Minocycline	7 (63.64)	1 (9.09)	3 (27.27)

Table. 6: ICU Outcome of Bcc Patients

Outcome	Bcc Positive (n=11)	Bcc Negative (n=301)	p-value
Discharged	7 (63.64)	240 (79.73)	
Mortality	4 (36.36)	61 (20.27)	0.182
Mean ICU Stay (days)	12.40 ± 3.20	8.60 ± 2.75	0.031*

*Statistically significant

DISCUSSION

In the present study, most patients were in the 31–50 year age group (39.74%), and males constituted 61.54% of the cohort, indicating that middle-aged men formed the largest ICU subgroup affected by suspected infection. A similar male predominance has been reported in the literature; for example, Fomda et al. (2023) described 121 patients with *Burkholderia cepacia* complex bloodstream infection in a surgical ICU outbreak, of whom 75.00% were male and the median age was 35 years. Although their study focused on an outbreak setting and only bloodstream infections, the comparable male preponderance supports the possibility that critically ill male patients may be more frequently exposed to invasive devices, prolonged hospitalization, and hospital-acquired gram-negative infections than female patients.⁷

In our study, 57.05% of admissions were from the Medical ICU and 65.38% of patients had comorbidities, showing that a substantial burden of illness was concentrated in medically complex patients. This observation is in line with the review by Abdallah et al. (2018), who identified 30 ICU outbreaks of Bcc in non-cystic fibrosis patients, including 17 outbreaks in adult ICUs, and noted that indwelling central lines, renal failure requiring hemodialysis, multiple bronchoscopic procedures, and recent abdominal surgery were important risk factors for acquisition. Compared with that review, our data extend the same clinical picture at the patient level by showing that nearly two-thirds of ICU patients from whom samples were analyzed already had underlying comorbid disease, which may have increased vulnerability to opportunistic nosocomial pathogens such as Bcc.⁸

With respect to specimen distribution, blood was the most commonly received sample in our study (32.69%), but culture positivity was highest in sputum (55.56%), followed by urine (47.73%). Likewise, among Bcc-positive isolates, sputum contributed the highest share (36.36%), suggesting an important respiratory reservoir in ICU patients. This pattern is supported by Pegues et al. (1996), who investigated a large nosocomial outbreak of respiratory tract acquisition and identified 70 cases with positive sputum cultures, of whom 35 (50.00%) were

mechanically ventilated and 30 were in the ICU when Bcc was first isolated; among the early cluster, 86.00% were mechanically ventilated. Compared with that classic respiratory outbreak, our study showed a lower absolute respiratory burden but similarly suggests that airway instrumentation and respiratory care practices may facilitate Bcc persistence and transmission in critical care settings.⁹

The overall prevalence of Bcc in our cohort was 3.53% (11/312), which is low in absolute terms but clinically important because of the organism's intrinsic resistance profile and outbreak potential. In our series, sputum was the leading source of Bcc isolation (36.36%), followed by blood (27.27%) and urine (18.18%). In contrast, Rastogi et al. (2019), while describing a neurotrauma ICU outbreak, emphasized the significance of outbreak clustering severe enough to require molecular epidemiology and strict infection-control measures for containment. The difference between our relatively low prevalence and outbreak-based reports likely reflects that our study captured routine cross-sectional ICU sampling rather than a point-source outbreak; nonetheless, both settings underline that even a small number of Bcc isolates warrants careful surveillance because isolated sporadic cases can precede hospital transmission events.¹⁰

When clinical associations were examined, age group ($p=0.421$), gender ($p=0.637$), and ICU type ($p=0.312$) were not significantly associated with Bcc positivity in our study. This absence of demographic association agrees with the case-control study by Bressler et al. (2007), who evaluated 40 ICU patients with Bcc bacteremia and 119 matched controls and found that age, sex, and race were similar between cases and controls. Their study instead identified procedure-related and device-related exposures such as dialysis-requiring renal failure, recent abdominal surgery, multiple bronchoscopies, tracheostomy, and central lines as important determinants. Taken together, these findings suggest that Bcc acquisition in ICU settings is driven less by demographic variables and more by severity of illness, invasive interventions, and healthcare-associated exposure.¹¹

In contrast to the non-significant demographic associations, comorbidity was significantly associated with Bcc infection in our study, with 90.91% of Bcc-positive patients having underlying comorbid conditions compared with 64.45% of Bcc-negative patients ($p=0.048$). This is biologically plausible and is supported by Ku et al. (2011), who studied 27 patients with Bcc bacteremia and reported an overall 28-day mortality of 41.00%; notably, underlying diabetes mellitus was significantly associated with mortality ($p=0.033$). Although their endpoint was mortality rather than acquisition, both studies point to the same clinical principle: underlying systemic disease likely compromises host defenses, complicates treatment, and predisposes critically ill patients to worse Bcc-related outcomes.¹²

The antimicrobial susceptibility pattern in our study showed the highest sensitivity to trimethoprim-sulfamethoxazole (81.82%), followed by levofloxacin (72.73%), ceftazidime and minocycline (63.64% each), meropenem (54.55%), and piperacillin-tazobactam (45.45%). A somewhat similar but overall more favorable profile was reported by Lee et al. (2020) in a retrospective study of Bcc bacteremia in non-cystic fibrosis patients, where susceptibility rates were 92.80% for trimethoprim-sulfamethoxazole, 90.30% for piperacillin-tazobactam, 75.50% for ceftazidime, 72.30% for meropenem, and 64.10% for levofloxacin. Compared with Lee et al., our isolates retained good activity to trimethoprim-sulfamethoxazole and levofloxacin but showed notably lower susceptibility to piperacillin-tazobactam and meropenem, which may reflect local antimicrobial pressure and the importance of institution-specific antibiograms for stewardship decisions.¹³

Our susceptibility findings also compare reasonably with the study by Özdemir et al. (2024), who analyzed 87 patients with Bcc infection, most of whom were in ICUs (79.30%), and reported susceptibility rates of 74.70% to trimethoprim-sulfamethoxazole, 70.30% to levofloxacin, 50.00% to meropenem, and only 23.40% to ceftazidime. Relative to that study, our isolates showed slightly better activity for trimethoprim-sulfamethoxazole (81.82% vs 74.70%), similar activity for levofloxacin (72.73% vs 70.30%) and meropenem (54.55% vs 50.00%), but substantially higher susceptibility to ceftazidime (63.64% vs 23.40%). This variation across studies likely reflects differences in strain composition, specimen source, prior antibiotic exposure, and testing practices, and reinforces that Bcc therapy should be guided by local susceptibility patterns rather than by extrapolation from other centers.¹⁴

Regarding outcomes, Bcc-positive patients in our study had a higher mortality rate than Bcc-negative patients (36.36% vs 20.27%), although this difference did not reach statistical significance ($p=0.182$). More importantly, Bcc-positive patients had a significantly longer mean ICU stay (12.40 ± 3.20 days vs 8.60 ± 2.75 days; $p=0.031$), indicating greater resource utilization and clinical complexity. A comparable pattern has been observed by El Chakhtoura et al. (2017), who analyzed 248 patients with Bcc bloodstream infection and reported mortality rates of 16.00% at 14 days, 25.00% at 30 days, and 36.00% at 90 days; they also found that increasing age and higher Pitt bacteremia scores predicted poorer outcome. The similarity between our mortality figure of 36.36% and their 90-day mortality of 36.00% suggests that Bcc remains a clinically serious pathogen in non-cystic fibrosis hospitalized adults, while the significant prolongation of ICU stay in our study further highlights its relevance to antimicrobial stewardship and infection-control programs.¹⁵

CONCLUSION

This study demonstrated that *Burkholderia cepacia* complex was an important opportunistic pathogen among ICU patients, with a prevalence of 3.53% and predominant isolation from respiratory specimens. The infection was significantly associated with the presence of comorbidities and was linked to prolonged ICU stay, highlighting its clinical and healthcare burden. Trimethoprim-sulfamethoxazole and levofloxacin showed the

highest susceptibility, emphasizing the value of local antibiogram-guided therapy. These findings underscore the need for early microbiological identification, strict infection control practices, and strengthened antimicrobial stewardship strategies in ICU settings.

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