



Assessment of Burkholderia cepacia Infections in Urology: Prevalence, Antibiotic Resistance and Treatment Outcomes at CNHU HKM, Benin

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Abstract: -

Background: Burkholderia cepacia, a Gram-negative bacterium within the Burkholderia cepacia complex (BCC), is notorious for its antibiotic resistance and potential to cause severe nosocomial infections. This pathogen poses significant challenges in hospital settings, particularly in urology and following endourological procedures, due to its biofilm-forming ability and environmental resilience.

Objective: This study aimed to evaluate the prevalence, impact, and antibiotic sensitivity of B. cepacia infections among patients at the urology clinic of CNHU HKM in Benin over a 36-month period.

Methods: A retrospective and prospective cross-sectional study was conducted from January 2022 to June 2024, involving 69 patients infected with B. cepacia. Data collection focused on patient demographics, surgical history, microbiological culture results, antibiotic use, treatment duration, and clinical outcomes.

Results: Out of 711 hospitalized patients, 310 were infected (43%), with 69 cases (9.7%) identified as B. cepacia. The average patient age was 61 years. The infection was detected in 57% of patients upon admission and 43% post-operatively. Antibiotic sensitivity tests showed effectiveness to meropenem (62%), ceftazidime (65%), and cotrimoxazole (78%). Recurrence rates were 21% with meropenem, 5% with cotrimoxazole, and no recurrences with a combination of meropenem and cotrimoxazole over 6 months. The average cost of antibiotic therapy was 112 USD, with an average hospital stay of 16 days and a 51.3% recurrence rate in treated patients.

Conclusion: Burkholderia cepacia is a multidrug-resistant pathogen that complicates the treatment of urinary and pulmonary infections, particularly after endoscopic procedures. Effective management requires targeted antibiotic therapy and adherence to strict disinfection protocols. The combination of meropenem and cotrimoxazole proved effective, with no recurrences observed in the study period.

Keywords: Burkholderia cepacia, Infections, Endoscopic, Antibiotics.

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Introduction

Burkholderia cepacia is a Gram-negative bacterium belonging to the Burkholderia cepacia complex (BCC), known for its antibiotic resistance and ability to cause severe nosocomial infections. This pathogen is particularly problematic in hospital settings, especially in urology and following endourological surgery, due to its ability to form biofilms and survive in various environments [1, 2]. This article presents a retrospective study conducted at the urology clinic of CNHU HKM in Benin over a period of 36 months, aimed at evaluating prevalence, impact, and antibiotic sensitivity.

Study Objectives

1. To assess the prevalence of urinary infections caused by B. cepacia among patients hospitalized at the urology clinic of CNHU HKM.
2. To analyze the antibiotic sensitivity of B. cepacia to guide optimal treatment.
3. To propose recommendations for improving the management and prevention of nosocomial urinary infections.

Methodology

This is a retrospective and prospective cross-sectional study over an 18-month period from January 2022 to June 2024, conducted at the University Clinic of Urology and Andrology of the Hubert K. Maga National Hospital Center. A total of 69 patients were included in the study. We included all patients hospitalized during this period and infected with *Burkholderia cepacia* and excluded those not infected. Data collection considered age, sex, history of endoscopic surgery, microbiological culture results, antibiotics used, duration of treatment, and clinical outcomes.

Results

310 infected patients were recorded out of 711 hospitalized cases during the study period, representing 43%. *Burkholderia cepacia* infection was found in 69 patients within the infected population, or 9.7%. On average, our patients were 61 years old, with ages ranging from 25 to 71 years. The sex ratio was 2.45 men to 1 woman. 57% of our patients were admitted with a positive uroculture identifying *Burkholderia cepacia*, compared to 43% of cases infected post-operatively. The antibiogram showed sensitivity to only three antibiotics in 89% of patients: meropenem (62%), ceftazidime (65%), and cotrimoxazole (78%). Patients infected with *B. cepacia* had an average hospital stay of 16 days. A recurrence rate of 51.3% was observed among patients treated for *B. cepacia* infections. Recurrence after treatment was observed in 21.3% of patients treated with meropenem, 19% of those treated with ceftazidime and 11% of those treated with cotrimoxazole. No recurrence was observed with the combination of meropenem and cotrimoxazole after 6 months of surveillance. The average cost of antibiotic therapy was 112 USD.

Discussion

Burkholderia cepacia is a Gram-negative bacillus responsible for severe pulmonary infections in cystic fibrosis and urinary infections. It is known for its multidrug resistance [1, 2]. This bacterium has the ability to form adhesive biofilms, which facilitates its attachment to the mucous membranes of the respiratory and urinary tracts, making eradication difficult [3, 4, 5, 6, 7]. After bacteriological analysis, we noted specific and unique sensitivity to three antibiotics: cotrimoxazole, ceftazidime, and meropenem. Cotrimoxazole demonstrated the best clinical efficacy with a sensitivity of 78%, compared to meropenem (62%) and ceftazidime (65%). Other studies show that cotrimoxazole has a lower average MIC of 2 µg/mL compared to meropenem and ceftazidime [2, 9]. Limited sensitivity to meropenem and ceftazidime is increasingly cited in studies [8, 9]. Our data also show a high recurrence rate (51.3%) among patients treated for *B. cepacia* infections in the first year, but significant improvement was observed with combined treatment of cotrimoxazole and meropenem. The strict implementation of disinfection protocols, as well as the targeted use of cotrimoxazole and meropenem, contributed to this reduction [2, 10]. In 2017, a study noted the effectiveness of the therapeutic combination of meropenem with ceftazidime [8]. Given the cost of this combination, we opted for a combination of meropenem and cotrimoxazole, with no recurrence observed after 6 months of surveillance in our patients. Recent studies also highlight the significant role of cotrimoxazole in the eradication of *Burkholderia cepacia* [2, 8]. We found this infection predominantly in patients who underwent endoscopic surgery in urology. This situation had previously been reported with the

discovery of contamination in anesthetic gels used for lubrication in endoscopic surgery and irrigation fluids in bronchoscopy [9, 10].

Conclusion

Burkholderia cepacia is a multiresistant pathogen, affecting either the urinary or pulmonary systems, requiring costly management and often observed after endoscopic procedures.

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