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Burkholderia Cepacia Sepsis: A Neonatal Case

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ABSTRACT

Burkholderia Cepacia is an aerobic, glucose non-fermenting, motile and multidrug resistant gram-negative bacteria; which is not considered from the normal human flora. It is a rare cause of sepsis in newborns and its transmission involves human contact with heavily contaminated medical devices and disinfectants.

We are describing a rare case of sepsis by Burkholderia Cepacia in a pre-term infant, diagnosed in Neonatal Intensive Care unit, University hospital; Marrakesh.

He was a male newborn, he was a pre-term with intrauterine growth retarded, he was admitted for sepsis. The diagnosis was made by blood culture. The treatment was a bi-antibiotic treatment: imipenem and aminoglycoside. The outcome was fatal after 9 days.

Burkholderia Cepacia is a nosocomial pathogen of humans in both immunocompromised and hospitalized patients. It causes infections that are proving difficult to treat because of both high intrinsic (aminoglycosides and colistin) and acquired resistance (β-lactams). We conclude that the drugs are already limited in this bacteria. Progress remains to be made in antibiotic therapy, as often molecules are active in vitro and especially *in vivo*.

Keywords: *Bacteremia, Burkholderia cepacia complex, Neonatal, Sepsis*

Introduction

Burkholderia cepacia complec (BCC), formerly known as *Pseudomonas cepacia* was assigned to a new genus *Burkholderia* in 1992, in honor of its discoverer. Currently BCC comprises seventeen closely related species (formerly genomovars), belonging to the phylum Proteobacteria *Burkholderia cepacia* is a gram-negative bacillus commonly found in soil and moist environments and capable of surviving and growing in nutrient-poor water (Goldmann and Klinger, 1986). *It* has emerged as an important opportunistic pathogen in hospitalized and immunocompromised patients (Anderson *et al*., 1991). BCC causes infections that are proving difficult to treat because of both high intrinsic (aminoglycosides and colistin) and acquired resistance (β lactams) and also occasionally to cotrimoxazole (Gautam *et al*., 2011).

We describe a sepsis of *B. cepacia* bacteremia occurring in Neonatal Intensive Care Unit, University Hospital, Marrakesh; and we report the results of epidemiological investigations. To identify the source of infection, to study the clinical profile and outcomes of neonates with Burkholderia septicemia and to determine the antimicrobial susceptibility patterns of the isolates.

Case Report

He was a male newborn; he was a pre-term with intrauterine growth retarded. He was born from unrelated marriage, of 24-year-old mother, poorly followed pregnancy estimated at 36weeks of amenorrhea. Infectious anamnesis was positive: premature rupture of membranes greater than 24 hours with a tinted amniotic fluid. The patient was hospitalized at the first hour of life for a respiratory distress scored at 3 / 10th according to the Silverman score. The patient was placed on non-invasive ventilation and traited by antibiotictherapy with the third-generation cephalosporin associated with gentamicin. The evolution was marked by the aggravation of his respiratory distress and the appearance of signs of sepsis. The patient was under the general anesthesia, intubated with Carbapenem associated with Amikacin.

The diagnosis of BCC Multi-drug-resistant was made by blood culture. The blood culture was made in Microbiology Department, in Universty Hospital. It‘s a third level laboratory, with trained personnel in order to avoid the errors or limitations observed in clinical reports or studies on microorganisms associated with the environment. BCC is difficult to isolate due to its slow growth. Its identification is a laborious and complex task, in our laboratory they use differential culture media, automated systems and complementary biochemical assays.

The newborn had died after 9 days of hospitalization.

The first neonate might have predisposed to infections due to BCC with their physiological state of low immunity. This sporadic infection due to this bacterium in our ICU was controlled by the timely information given to the clinician, implementation of infection control measures such as fumigation, thorough hand washing techniques, screening of the staff in ICU, disinfecting thermometers and isolation of infected children.

Discussion

An increasing proportion of neonatal sepsis is being attributed to non-fermenting gram-negative bacilli (NFGNB), particularly Burkholderia cepacia complex (BCC) (Mali *et al*., 2017). It is widely distributed in natural habitats such as soil, water and nutrient poor water. As BCC is employed in the commercial industry for bio- control, bioremediation in toxic agents and as plant growth promoting

agents, environment can be a reservoir for the acquisition of BCC infection. A variety of human infections caused by BCC include bacteremia, septic arthritis, urinary tract infections, peritonitis and respiratory tract infections (Nivedhana *et al*., 2016). *B. cepacia* is a fastidious gram-negative bacillus that can be difficult to isolate, since it usually grows slowly when compared to other organisms frequently found in sputum samples from CF patients, such as *P. aeruginosa*. *B. cepacia* is also difficult to identify after isolation, and misidentifications occur very frequently (Van Dalem *et al*., 2018).

Microbiological reports often identify both Pseudomonas species and Burkholderia cepacia as NFGNB, but their antimicrobial susceptibility and treatment options are different. BCC is intrinsically resistant to aminoglycosides, polymyxins and variable resistance to β-lactams, chloramphenicol, fluoroquinolones and trimethoprim. Minimum Inhibitory Concentration determination of our isolates revealed multidrug resistance. Though BCC species are highly resistant, antibiotic combinations have exhibited a reasonable response as shown in some studies. The drugs of choice against BCC include ceftazidime, minocycline, meropenem and cotrimoxazole. Drug combinations such as meropenem with ciprofloxacin and tobramycin as well as ceftazidime -tobramycin were reported in successful treatments. The high level of intrinsic resistance in this organism, coupled with the lack of newer or effective antibiotics, make treatment options very difficult (Narayanaswamy *et al*., 2017). Prevention and treatment of BCC is challenging due to the organism's inherent ability to survive in moist environments and intrinsic antimicrobial resistance (Akinboyo *et al*., 2018).

Conclusion

The present study report highlights the potential role of *B. cepacia* in causing sporadic sepsis especially in ICUs. It also emphasizes the clinicians to be vigilant about the possible sources of infection, their surveillance and management. We conclude that the drugs for treating BCC infections are already limited and could prove fatal.

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