



Febrile urinary tract infection in an immunocompetent male caused by *Burkholderia multivorans*- evidence of transmission in a home hot tub

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ABSTRACT

Burkholderia are opportunistic pathogens. Here we describe a case of *Burkholderia multivorans* urinary tract infection in a previously healthy man. The bacterium was likely introduced during sexual intercourse in a home hot tub contaminated with the bacterium. The infection led to urinary retention and was successfully treated with trimethoprim-sulfamethoxazole.

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Introduction

Burkholderia is a genus of opportunistic pathogens typically isolated from airways of patients with severe underlying lung conditions or in cases of melioidosis. *Burkholderia* survive in nutrient poor environments such as soil or pool water [1]. Urinary tract infections (UTIs) caused by this genus have rarely been described. Reported cases of *Burkholderia* UTI involve patients with iatrogenic introduction of bacteria with a lubricant gel [2], patients with immunosuppression after renal transplant [3,4], two undefined nosocomial cases [5], two patients with diabetes and one traveler with UTI caused by *Burkholderia pseudomallei* [6,7], and four outpatients treated at a urological center [8]. The four outpatients described in the recent publication had no reported severe underlying medical conditions [8]. *Burkholderia* are intrinsically resistant to many antimicrobials and determination of resistance in this genus is difficult. Most cases of *Burkholderia* UTI have been treated with trimethoprim-sulfamethoxazole [6,8].

Case report

A 57 years-old man in good physical health with a previous history of recurrent prostatitis presented with dysuria, and fever to his general practitioner who initiated treatment with ciprofloxacin 500 mg bid. In the evening of the same day, the patient presented

in the emergency room of our hospital with urinary retention and received a Foley catheter. Two days later the patient came back to the emergency room due to continuous fever, dysuria and pains from the lower abdomen. On physical examination he was afebrile but was tender upon palpation of the lower abdomen. CRP was 91 mg/L and leukocyte count was of 11×10^3 cells/ μ l. The urinary culture taken at the general practitioner demonstrated $>10^5$ CFU/ml of a bacterium from the *Burkholderia cepacia* complex (BCC). The patient received one dose of ceftriaxone and treatment was changed to trimethoprim-sulfamethoxazole (160 mg/800 mg) tid. On check-up two days after initiation of trimethoprim-sulfamethoxazole, the patient still reported fever and dysuria. An attempt to withdraw the catheter was unsuccessful. After another 10 days the catheter was successfully removed and the patient was afebrile and without dysuria. The patient received a total of 14 days treatment. Control-urinary culture two weeks after the cessation of treatment was negative and the patient was free from symptoms.

The patient reported that he two days prior to the start of symptoms, together with his wife, had used the home hot tub and that sexual intercourse had taken place in the water. The wife also experienced dysuria but improved spontaneously. A water sample from the pool was subjected to culture which revealed 1×10^5 CFU/ml of BCC bacteria. The water also contained equal amounts of two other oxidase positive, gram-negative bacilli that could not be reliably identified by MALDI-TOF MS. Both the isolate from the patient and from the pool were analyzed by MALDI-TOF MS (Bruker MALDI Biotyper) and were identified as *Burkholderia multivorans* with a score >2.0 . Since MALDI-TOF MS is not a reliable method to identify species within the BCC [9], both isolates were

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subjected to sequencing of *recA*. PCR to amplify *recA* as described by Payne et al. [10] was performed and the products were Sanger sequenced. The obtained sequences were compared to published sequences in NCBI BLAST and they were both 100% identical to *recA* of *B. multivorans*. The isolate from the urinary culture was sent to the reference microbiological laboratory in Karlskrona, Sweden, where antimicrobial susceptibility testing was performed using the European Committee on Antimicrobial Susceptibility Testing (EUCAST) broth microdilution method for nonfastidious bacteria (ISO 20776-1 standard). The MIC of trimethoprim-sulfamethoxazole was 0.5 µg/ml, while that of ciprofloxacin was 1 µg/ml. No formal classification to S, I or R could be made due to the limitations of AST of members of the BCC and the absence of clinical breakpoints. EUCAST does not recommend susceptibility testing of BCC to guide antimicrobial therapy.

Discussion

This case demonstrates that *Burkholderia* can cause UTI in previously healthy individuals. The response to initial treatment with ciprofloxacin was not satisfactory and the response to trimethoprim-sulfamethoxazole was relatively slow despite that a high dose was administered. The relatively low MIC for trimethoprim-sulfamethoxazole of this isolate was an indication that it could be an effective treatment for a UTI, especially since the substances are concentrated in urine. The mode of introduction of the bacterium was through sexual intercourse in contaminated water. Home hot pools are increasingly marketed and sold in many countries and *Burkholderia* is a potential colonizer of such pools. The most common infection encountered after bathing in contaminated pool water is probably dermatitis caused by *Pseudomonas aeruginosa* but this report demonstrates that also

UTI might occur. Persons should take care not to introduce potentially contaminated water into normally relatively sterile body sites and take care to follow instructions for use and water exchange of the pool.

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