

A case of *Raoultella planticola* causing a urinary tract infection in a pediatric patient

Cailly Howell, Joseph Fakhoury

Department of Pediatric and Adolescent Medicine, Western Michigan University, Homer Stryker MD School of Medicine, Kalamazoo, USA

Correspondence to: Cailly Howell, MD. Department of Pediatric and Adolescent Medicine, Western Michigan University, Homer Stryker MD School of Medicine, 1000 Oakland Drive, Kalamazoo, 49008 MI, USA. Email: Cailly.Howell@med.wmich.edu.

Abstract: *Raoultella planticola* (*R. planticola*) is an abundant environmental bacterium that rarely infects humans. There is only one known case of *R. planticola* causing a urinary tract infection (UTI) in a pediatric patient. This is a second case of *R. planticola* potentially causing a symptomatic UTI in a 2-month-old female child with no known medical problems.

Keywords: Bacteriuria; pyrexia; *Raoultella planticola* (*R. planticola*)

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Introduction

Urinary tract infections (UTIs) are an important cause of fever and infection in the pediatric patient population. It is estimated that the prevalence of UTIs in children <19 years of age with symptoms or fever is 7.8% (1). *Escherichia coli* is the most common cause of UTIs in the pediatric population, causing approximately 80% of pediatric UTIs (2). Other gram-negative bacterial infection that less frequently result in UTIs include *Enterobacter*, *Proteus*, *Klebsiella*, *Citrobacter* as well as *Raoultella*.

Raoultella is a gram-negative, aerobic bacillus primarily considered environmental with high prevalence in soil and water. Infection with *Raoultella* occurs very rarely, however when reported it is largely found in patients with underlying biliary tract disease (12.5%), history of immunodeficiency (56.3%), or history of trauma (3). Infection is infrequently found in healthy individuals. There are few identified *Raoultella* infections resulting in UTIs or cystitis (3,4). Here we report the second case of a pediatric patient with a UTI caused by *Raoultella*.

Case presentation

A 2-month-old female with a history of resolved hyperbilirubinemia presented to the emergency department

for evaluation and management of hematochezia and a 1-day history of fever. The patient's mother related a history of three episodes of hematochezia and loose stools, a temperature of 102 °F, diminished appetite, and decreased urine output. The patient has a 2-day history of intermittent cough and rhinorrhea. She denied any hematuria, excessive irritability, emesis, reptile or pet exposure, travel, visitors from endemic areas, or any recent antibiotic exposures. The patient was admitted for dehydration.

The patient's physical exam and vital signs were normal. She was interactive and did not appear significantly clinically dehydrated. The patient's mother noted a soiled diaper with mixed blood and stool present. No frank bleeding from the rectum or discrete anal fissures were seen. A basic, minimally invasive workup was initiated. Urinalysis was positive for leukocyte esterase, elevated white blood cells (WBCs), and bacteria. Subsequent catheterized sample for urine culture was also positive for greater than 100,000 colony forming units per mL of *Raoultella planticola* (*R. planticola*). The cultured organism was found to be pan-sensitive including to Rocephin and Keflex. One dose of Rocephin was given during the patient's admission, and she was started on Keflex upon discharge. Keflex was to be continued for 10 days. As recommended for infants with a febrile UTI, renal and bladder ultrasonography was performed on the infant with

normal results. Blood and stool cultures remained negative. There were no additional episodes of hematochezia or fever during her admission, and her appetite improved. Fluids were weaned the second day of admission as oral intake had improved to baseline and urine output had normalized. The most likely diagnosis explaining the patient's hematochezia and potentially her fever was viral gastroenteritis, though a *R. planticola* UTI remains a possible cause for the fever.

After discharge, it is anticipated that the child will follow-up and receive continued care from her pediatrician. Full resolution of the UTI is expected as the organism was found to be sensitive to the ordered treatment.

Discussion

This is the first documented case of *R. planticola* resulting in a UTI in a pediatric patient without significant concurrent medical history such as an oncologic diagnosis. Background information on this case and previously reported infections were identified through Elsevier's SCOPUS and PubMed database searches. The only other reported case of *R. planticola* causing a UTI was in a 16-month-old patient with rhabdomyosarcoma of the bladder neck (5). It is presently unknown whether infections due to *Raoultella* species are increasing in prevalence or in virulence, or if the scientific community has only improved their recognition of these bacteria.

Prior to 2001, *Raoultella* species were classified as a *Klebsiella* species (*K. planticola* [1981] and *K. trevisanii* [1983]) due to multiple similarities (6). *Klebsiella* and *Raoultella* species have several virulence factors in common including type 1 fimbriae and mannose-sensitive hemagglutinin (7). These virulence factors significantly contribute to the development of a UTI. Due to these similarities and the commercial identification tests available, only recently can tests differentiate between *Raoultella* and *Klebsiella* species. As such, there is presently very limited data on the prevalence of infections caused by *Raoultella* over time. Olson *et al.* propose that the low incidence of *R. planticola* infections is primarily due to this inability to differentiate the two species (7). This may be one explanation for the seemingly increasing recognition of these infections. However, this may not fully account for a case of a UTI caused by *R. planticola* now documented in an otherwise well infant. Continued surveillance with specific testing able to differentiate between *Klebsiella* and *Raoultella* species is warranted to determine prevalence of *R. planticola* infection in the pediatric patient population and its pathogenicity in

otherwise healthy individuals.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

Informed Consent: It was waived as it was not required in the writing of this article. Case data has been entirely de-identified from person, location, and date.

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