

CASE REPORT

Pseudomonas aeruginosa as a Cause for Urinary Tract Infection in Children with No Predisposing Factors

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ABSTRACT

Pseudomonas is considered to be an unusual organism in urinary tract infections. Most of the time, predisposing factors are present, which makes its colonization easier. In our case report, we conclude the possibility of asymptomatic colonization of *Pseudomonas aeruginosa* in urine even without any risk factors for its growth. So far, *Pseudomonas* urinary infection has been associated in children with urologic abnormalities or those who were hospitalized or catheterized or used any prior antibiotics. Following this case report, clinicians should note its unusual occurrence without any causative factors.

Keywords: Case report, Children, Community acquired, *Pseudomonas aeruginosa*, Risk factors, Urinary tract infection.

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BACKGROUND

Urinary tract infection (UTI) is a very common illness in children. It can virtually occur in any age from neonates to adults. Properly taken sample for urine culture plays an important role in identifying the microorganism responsible for urinary infection. Moreover, it needs timely attention, appropriate evaluation, and treatment to cure the disease as recurrent infection can damage the renal parenchyma and cause hypertension and renal insufficiency later on in adulthood.

CASE DESCRIPTION

An 8-month-old male child presented with history of high-grade fever of 1-day duration. No urinary symptoms were noted. Phimosi was absent on local examination. On systemic examination, focus for fever could not be found. Blood counts were within normal limits and CRP was negative. Urine was clear and routine test showed occasional pus cells only. Child was initiated on symptomatic treatment. On day 2, fever subsided. However, culture of a clean catch mid-stream sample done on 1st day showed heavy growth ($>10^5$) of *Pseudomonas aeruginosa*. As he had no urinary symptoms and was afebrile by day 2, repeat catheterized urine culture was sent on day 3, which again showed heavy growth of *Pseudomonas aeruginosa* ($>10^5$) with sensitivity to ceftazidime, aminoglycosides, and fluoroquinolones. He had no prior history of UTI, antibiotic usage, catheterization, or any other previous illnesses. The child was started on intravenous amikacin. His repeat urine culture after 5 days of treatment came as sterile. Ultrasonogram kidneys, ureters, and bladder showed normal anatomy of urinary system. Micturating cystourethrogram was done 6 weeks later and was found to be normal.

DISCUSSION

Urinary tract infection is classically diagnosed by urine culture and sensitivity. The process of collecting urine from small infants can be quite tricky compared to a toilet-trained child. In children, urine is usually obtained by any of the four ways—sterile urine bag, clean catch, catheterization, or suprapubic aspiration. Sterile urine bag collection, though easy in infants, has got high contamination

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rates. Clean catch is the preferred mode of getting urine from older cooperative children. Catheterization is an invasive technique opted for young infants, that has contamination risks more or less similar to a clean catch sample.¹ The gold standard is suprapubic aspiration which has very minimal contamination rates. However, this procedure is invasive and can evoke parent's anxiety. So, parental preference is another factor that determines the method of urine collection in children.

The most common pathogen in UTI is *E. coli* (65–75%).² Less likely ones include *Klebsiella* (23%), *Proteus* (7%), other Enterobacteriaceae, *Enterococcus*, *Pseudomonas aeruginosa*, and *Staphylococcus saprophyticus* (1–4%).^{2,3} Various literatures have reported frequency of *Pseudomonas* urinary infection to be 2.4–9%.^{4–6} One study reported the incidence of *Pseudomonas* UTI in healthy children in their population to be 6.7%⁷ and described history of prior UTI, use of antibiotics, hospitalization, genitourinary anomalies, vesicoureteral reflux, and previous surgeries as potential causes for *Pseudomonas* colonization in urine.^{6,7} Here, we report a case of first episode of community-acquired *Pseudomonas* UTI in an infant who has no major risk factors for this infection.

Pseudomonas UTI is significant because of their innate resistance to common antibiotics used for urinary infections. Because of that, it is more often seen in children who received common antibiotics for uroprophylaxis as most oral antibiotics have no action against *Pseudomonas*, which favors its selective colonization. Literature mentioning community-acquired *Pseudomonas* urinary infection in children are scarce. A study by Ozumba⁴ in Nigeria showed that *Pseudomonas* was responsible

mainly for hospital-acquired UTIs in children with urinary tract surgeries and other predisposing conditions. Other studies from Israel⁶ and Greece⁷ mentioned about children with community-acquired *Pseudomonas* UTI. Almost all literatures described the association of *Pseudomonas* to some type of urinary anomalies or prior antibiotic usage or other significant factors.

CONCLUSION

Unlike the past literature, our patient neither had any urological abnormalities nor had other predisposing factors. This suggests the possibility of asymptomatic colonization of *Pseudomonas aeruginosa* in the urinary tract of children in the community. Through this report, we want to make the practicing pediatricians aware of this rare possibility also.

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