CASE REPORT

Urinary Tract Infection in an Immunocompromised ICU Patient by *Myroides* Species: A Multidrug-resistant Microorganism

Zia Arshad[1], Matendra Yadav[2], Rati Prabha[3], Ravi Prakash[4], Gyan P Singh[5], Haider Abbas[6]

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Highlights

Pyrexia of unknown origin is among the topic of concern in intensive care unit. Some rare isolates like *Myroides* species affect the immunocompromised host and have intrinsic resistance to various existing class of antimicrobial agents. Patient with prolonged ICU stay, receiving broad spectrum antibiotics, steroids with compromised nutrition and other comorbidities like anemia in this case make them susceptible for opportunistic infections. In this era, when antimicrobial resistance has reached alarming levels day by day all over the world, these organisms require early identification and prompt treatment to reduce the morbidities, length of ICU stay, and financial burden. *Myroides* spp. are an emerging multidrug resistant organism. This case report elucidates urinary tract infection in a postpartum patient admitted in ICU with fever and acuter onset areflexic flaccid quadriparesis.

Keywords: Encephalitis, Immunocompromised host, *Myroides*, Opportunistic infection, Urinary tract infection.

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Introduction/Background

Myroides spp. are gram-negative rods, while infrequently responsible for opportunistic infections in immunocompromised patients. *Myroides* can be isolated substantially in water, soil, food, and in sewage treatment plants. There are reports that indicate increasing numbers of case of urinary tract infections and skin and soft tissue infections are caused by *Myroides* spp. Selection of appropriate antibiotic is a challenging task as they have intrinsic multidrug resistance to many antibiotic groups due to production of a biofilm. This necessitates prompt identification and early intervention.

Case Description

This case report illustrates a case of acute viral encephalitis admitted in intensive care unit with altered sensorium in postpartum period.

A 19-year-old postpartum female was admitted to the Critical Care Unit in view of high-grade fever with generalized tonic-clonic seizure and type I respiratory failure with severe anemia. After admission, the patient was evaluated and cerebrospinal fluid for chemistry, cytology, and viral markers for CMV, HSV, Varicella, JE, EBV, were screened. Brain imaging (MRI) was done which shows sign of meningitis. Cerebrospinal fluid analysis was in favor of viral etiology but viral markers were negative. Blood, urine, and cerebrospinal fluid cultures were negative for any isolates. The patient was managed conservatively in the form of antibiotics, antiviral (acyclovir), antiepileptic, and other supportive measures were taken. Chest X-ray showed clear lung fields with no sign of pneumonia. Blood and urine were sent for culture and antibiotic sensitivity test (AST) that was negative for any microorganism. Patient's sensorium was gradually improved, but patient was found to have flaccid quadriparesis with absent deep tendon reflexes, for which neurologist consultation was taken. After 15-day of treatment with antimicrobial therapy including antiviral, patient recovered and gained full consciousness & orientation, although slight nodding of head and limb muscle weakness was still there. The patient was febrile throughout her course of treatment. Patient was still having high-grade fever which was explained by urine culture which showed heavy growth of *Myroides* species. AST showed resistance to various antibiotic classes.

The AST report is showed resistance to aminoglycoside, penicillin group, carbapenem, polypeptides, cephalosporins, linezolid, cotrimoxazole, and monobactam groups of antibiotics. The bug was only sensitive to trimethoprim + sulphmetoxazole (TMP-SMX) and ciprofloxacin. This patient was treated initially with combination of antibiotic including intravenous piperacillin + tazobactam along with oral ciprofloxacin and tab trimethoprim+ sulphmethoxazole. After 7 days, piperacillin + tazobactam was stopped and patient was continued on ciprofloxacin and trimethoprim + sulphamethoxazole treatment for next 7 days. After 14 days of revised antibiotics treatment, the urine culture showed no microorganism and patient became afebrile. Patient was discharged and followed up in follow up clinic.

[1–5]Department of Anaesthesiology and Critical Care, King George's Medical University, Lucknow, Uttar Pradesh, India

[6]Department of Emergency Medicine, King George's Medical University, Lucknow, Uttar Pradesh, India

Corresponding Author: Zia Arshad, Department of Anaesthesiology and Critical Care, King George's Medical University, Lucknow, Uttar Pradesh,India,Phone:+919415722226,e-mail:ziaarshad13@gmail.com

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Discussion

Myroides spp., a genus of opportunistic gram-negative organisms previously known as Flavobacterium, rarely cause infection in human beings but can cause life-threatening infection in immunosuppressed patients. They were first time isolated in 1923. Initially only two species were identified, that was *M. odoratus*, formerly *F. odoratum* and *M. odoratimimus*. Recently some new species were also identified namely *M. pelagicus*, *M. profundi,* and *M. marinus* from sea water and *M. indicus* and *M. xuanwuensis* from soil.[1] *Myroides* spp. are difficult to treat organisms. Strains are resistant to several antibacterial classes, as in this case. Various mechanisms of resistant have been reported. Intrinsic resistance to β-lactamases is due to the presence of two metallo-β-lactamases, MUS-1 and TUS-1, which share a 73% of amino acid identity. Furthermore, a resistance island was found on the chromosome of the bacterium.[2] This region has different types of resistance genes, which are responsible for their resistance toward tetracycline, chloramphenicol, and β-lactam antibiotics. Recently it has been found that *M. odoratimimus* can survive intracellularly in human organs, even in human stomach. It can disseminate easily and is able to destroy human tissues.[2]

Further study and active participation and involvement of microbiologist are desired as this is a multidrug resistance organism and very infrequently present in clinical settings.[3] Many recent reports suggest that it may cause serious disease, even in immunocompetent hosts, and its intrinsic resistance to antimicrobial requires appropriate testing and timely intervention. Antibiotic sensitivity pattern for the organism was tigicycline, ciprofloxacin, TMP-SMX. Organism shows sensitivity toward piperacillin tazobactum and sometime to carbapenems.[4]

This postpartum patient received broad spectrum antibiotics during her prolonged ICU stay and received steroid therapy. Patient was anemic at the time of admission. Apart from this, the caloric intake in ICU is also compromised. Probably all these facts contributed to make her susceptible for this opportunistic infection caused by *Myroides* spp.

Conclusion

In the intensive care setting when there are so many factors which can be held responsible for ongoing fever even the origin of which may be noninfectious sometimes, the possibility of opportunistic infection by some rare isolates should always be kept in mind. Early identification of such isolates is necessary and prompt treatment could be done to reduce morbidity and complication.

Orcid

Zia arshad https://orcid.org/0000-0003-1762-3493
Matendra Yadav https://orcid.org/0000-0003-2217-4397
Gyan P Singh https://orcid.org/0000-0002-0851-0377

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