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Case Report

A case report on a rare presentation of *Aeromonas hydrophila*

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ABSTRACT

The genus *Aeromonas* is a member of the family *Vibrionaceae*. *Aeromonas hydrophila* is a water-dwelling, gram-negative rod-shaped bacterium, associated with diarrheal illness and less commonly, bone and soft tissue infections, especially among immunocompromised patients. Here we reported a rare presentation of *A. hydrophila* causing septicemia, septic arthritis, and osteomyelitis in an immunocompetent patient. A 35-year-old female, known hypothyroidism, presented with low back pain for one and half months and left side hip pain radiating to the left lower limb for one month. While in the hospital, she subsequently developed overwhelming sepsis secondary to septic arthritis and osteomyelitis. Which was secondary to a multidrug-resistant strain of *A. hydrophila*. Despite broad-spectrum antibiotics and aggressive surgical management, she had a recurrence of the infection. *Aeromonas* species infection in both immunocompetent and immunocompromised patients may result in high morbidity and mortality. This organism is highly virulent and multidrug-resistant. So early diagnosis and early administration of antibiotics would give better outcomes.

Keywords: *Aeromonas hydrophila*, Antibiotic resistance, Bone and soft tissue infection

INTRODUCTION

The genus *Aeromonas* is a member of the family *Vibrionaceae*. *A. hydrophila* is the most commonly isolated species associated with human infections.[1] Members of the genus *Aeromonas* are gram-negative, catalase, and oxidase-positive facultative anaerobic bacilli that have been associated with a wide range of illnesses in humans.[2] Currently, there are more than 20 species identified, but only 7 have been recognized as human pathogens, namely *A. hydrophila*, *A. caviae*, *A. veronii biovar sobria*, *A. veronii biovar veronii*, *A. jandaei*, *A. trota*, and *A. schubertii*, with the first three being the most common. Three species *A. hydrophila*, *A. caviae*, and *A. veronii biovar sobria* account for more than 85% of human infections.[3] Invasive *Aeromonas* infections usually occur among immunocompromised individuals. Primarily seen in patients with solid or hematologic malignancies or hepatobiliary disease, but also seen in healthy individuals after sustaining traumatic and crush injuries, near drowning events and burns.

Here we reported a rare case of *A. hydrophila* causing septicemia, septic arthritis and osteomyelitis.

CASE REPORT

We reported a case of *A. hydrophila* in a 35-year-old female, housewife from Ernakulam, who is a known case of hypothyroidism, came to Amrita Institute of Medical Sciences with complaints of low back pain for one and half months and left side hip pain radiating to the left lower limb for one month. Pain was a dull aching type and was progressive. On examination, she was afebrile (temperature of 98.4 ºF) with a pulse rate of 86/min, blood pressure of 120/80 mm of Hg, respiratory rate of

20/min, and saturation of 98% in room air. Systemic examination was normal. Considering the possibility of intervertebral disc prolapse, she was admitted for further evaluation. MRI whole spine screen showed mild diffuse posterior and left paracentral disc bulge with narrowing of left lateral recess with no neural compromise. During her stay in the hospital, she developed continuous high-grade fever (temperature-101.6 ºF) and bilateral knee pain. In view of fever spikes and elevated inflammatory markers, started on empirical intravenous antibiotics (injection piperacillin-tazobactam 4.5 gm eighth hourly) (Table 1). Examination revealed bilateral erythematous swollen tender knee joints. The possibility of septic arthritis was considered and an ultrasound knee was taken. It showed joint effusion with echogenic debris and increased peri synovial vascularity. Synovial fluid aspiration showed 5,500 cells/mm^3 (neutrophils of 90% and 10% mononuclear). In view of persistent fever spikes, up-trending inflammatory markers and neutrophil predominant synovial aspirate, her antibiotic hiked to injection meropenem (1 gm eighth hourly). Both blood and aspirate cultures showed growth of *A. hydrophila*. Orthopedics consultation was sought and a left knee arthroscopic washout was done. Tissue cultures showed the same growth and the organism was sensitive to ciprofloxacin, ceftazidime, meropenem, cefepime, levofloxacin, ceftriaxone and resistant to imipenem. As the meropenem was sensitive, the same line of antibiotics was continued. Meanwhile, the patient developed a sudden onset of breathlessness, started oxygen supplementation and shifted to the intensive care unit. CT pulmonary angiogram (CTPA) was done and was normal. As blood, synovial aspirate and tissue cultures were showing *A. hydrophila*, infective endocarditis was considered and a 2D echocardiogram was done, which showed no definite vegetations. Even after 2 weeks of the antibiotic course, the patient persisted to have fever spikes and high inflammatory markers. She was taken for a left knee arthrotomy and a washout was done. Repeat blood and tissue cultures showed no growth. Post-surgery the same line of antibiotics was continued. With the due course, she improved and was discharged with oral levofloxacin (750 mg once daily) for a total of 3 weeks duration. After 2 weeks she had reviewed in the outpatient services. She remained afebrile and her inflammatory markers were down trending. Again after 2 weeks she presented with complaints of high-grade fever for 2 days and left knee pain for 4 days. She was readmitted and started on injection meropenem (1 gm every eight hours) and trimethoprim/sulfamethoxazole. A repeat MRI left knee showed a significant synovial thickening and hypertrophy with features of the distal femur and proximal tibia osteomyelitis. Orthopedics consultation was sought and they advised continuing antibiotics. As the fever spikes were persistent, whole-body PET CT was taken and it showed diffuse heterogeneous FDG uptake in distal ⅓rd of bilateral femori and proximal ⅓rd of the left tibia- suggestive of osteomyelitis (Figure 1). With the course of antibiotics, she improved and was discharged.

Table 1: Summary of inflammatory markers.

Variables	Results
Total leucocyte count (4.0 K/ul-10.0 K/ul)	14.22
C-reactive protein (0.0 mg/l-1.0mg/l)	178.2
Procalcitonin (ng/ml)	1.8
ESR (8.0 mm/hr-20.0 mm/hr)	92

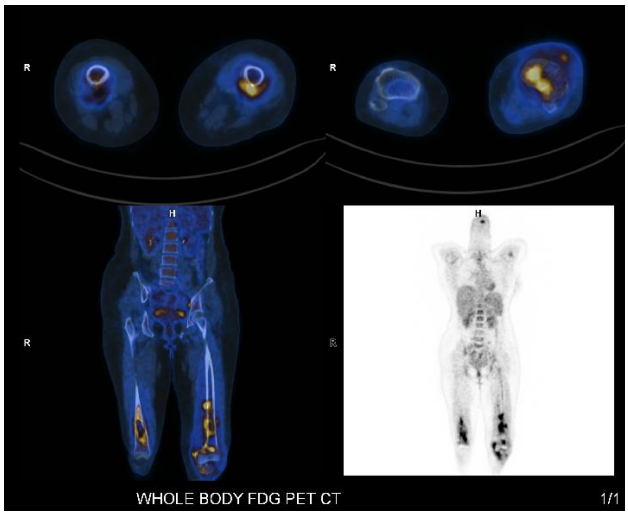

Figure 1: Whole body PET CT; diffuse heterogeneous uptake in distal 1/3rd of bilateral femori and proximal 1/3rd of left tibia-suggestive of osteomyelitis.

DISCUSSION

Aeromonads are members of the family *Vibrionaceae* and they are gram-negative, non-sporulating, facultative, anaerobic small bacilli with a ubiquitous distribution. They are water-dwelling, opportunistic pathogens commonly found in environmental sources such as fresh and brackish water, seafood, meat, and vegetables.[2] Three species *A. hydrophila*, *A. caviae*, and *A. veronii biovar sobria* account for more than 85% of human infections and are often polymicrobial. Fatality rates range from 28% to 46% in cases of severe bacteremia.[3]

Aeromonas spp infection has a variety of clinical presentations, including gastroenteritis, hepatobiliary tract infection, pneumonia, skin and soft tissue infections, empyema, meningitis, septic arthritis, osteomyelitis, endocarditis, and bacteremia.[4] *Aeromonas* infections are more commonly seen in immunocompromised hosts and are more often invasive and fatal. Hence, it has been recognized as a serious threat to human beings.[5] There were few cases reported on *A. hydrophila*, causing necrotizing fasciitis. Ugarte-Torres et al reported an *A. hydrophila* causing necrotizing fasciitis in immunocompromised patients and the organism was multidrug-resistant to ampicillin, ceftriaxone, ciprofloxacin and trimethoprim/sulfamethoxazole but susceptible to meropenem and tetracycline.[6] In our case organism showed sensitivity to ciprofloxacin,

ceftazidime, meropenem, cefepime, levofloxacin, ceftriaxone and resistance to imipenem. Regmi et al reported *A. hydrophila* caused necrotizing fasciitis in immunocompetent patients, which ended up in septic shock and amputation.[7] Padmaja et al and Yumoto et al also reported cases of A. hydrophila with septic shock.[8,9] These patients responded well with injection meropenem and other resuscitative measures. Similarly, in the current case use of imaging modalities (MRI and PET CT whole body) made it easy to identify the severity, focus, and extent of infection. Usage of broad-spectrum antibiotics had given a good outcome.

CONCLUSION

So, considering all the case reports, we can say that *Aeromonas* species infection in both immunocompetent and immunocompromised patients may result in high morbidity and mortality. This organism is highly virulent and multidrug-resistant. So early diagnosis and early administration of antibiotics would give better outcomes.

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