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Case Report

Sphingomonas paucimobilis Meningitis in a Child: First Case Report

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Received: September 09, 2018; **Published:** January 21, 2019

Abstract

Sphingomonas paucimobilis is a Gram-negative bacillus that has been reported as the cause of various community acquired and nosocomial infections. Only four cases of meningitis due to *S. paucimobilis* has been reported, all of them in adults. We report the first case of a pediatric patient with meningitis due to *S. paucimobilis.* A 3-year-old previously healthy boy developed fever, hetero-aggressivity, irritability, gait abnormalities and memory loss after a previous exposure with contaminated pool water. He was found with an abnormal neurological examination. He was treated empirically with ceftriaxone, acyclovir and dexamethasone. Computed tomography was normal and blood cultures were negative. Cerebrospinal fluid (CSF) analysis was abnormal with a Gram stain that showed Gram negative rods and *S. paucimobilis* that grew up in cultures. The patient had a rapid recovery from the second day of treatment and was discharged on hospital day 14.

Keywords: *Meningitis; Child; Infection; Sphingomonas; Colombia*

Introduction

Sphingomonas paucimobilis is a non-fermenting Gram-negative bacillus that is widely distributed in nature and has been reported as the cause of various community acquired and nosocomial infections [1]. This organism has been identified in septic arthritis, osteomyelitis, bacteremia, urinary tract infections, cutaneous infections, diarrheal disease, biliary tract infections, ventilator-associated pneumonia, peritonitis and endophthalmitis [1-3]. Only 4 cases of meningitis caused by this organism have been reported in the literature [4-7] and all cases have been reported in adults. Here we are presenting the first case report of *S. paucimobilis* meningitis in a child.

Case Report

A 3-year-old previously healthy boy presented to emergency department with fever and hacking cough for 2 weeks with previous exposure to contaminated pool water. He went to see the general practitioners twice where he was diagnosed with acute otitis media and treated with amoxicillin. His condition progressively became worse and he had fever (107.6°F), hetero-aggressivity, irritability, gait abnormalities and didn't remember any member of his family. The patient went to the local emergency department where it was found with an abnormal neurological examination and transferred to Hospital Universitario San Jorge, Pereira, for further management.

Upon examination, the patient was alert and oriented but with irritability. On lung auscultation was observed diminished lung sounds and crackles. Pupils were same size and were reacting normally. Bilateral horizontal gaze nystagmus, bilateral hyperreflexia and Brudzinski's sign were present. The muscular tone was normal in upper and lower limbs bilaterally. Initial laboratory evaluation was significant for leukocytosis (white blood cell count 15620/mm^3) with neutrophilia (absolute neutrophils count 10700/mm^3), monocytosis (absolute

monocytes count 1360/mm^3) and normochromic normocytic anemia (Hb 10,6 gr/dL, MCV 81,5 fL, MCH 26 pg/cell). Possible meningitis was suspected and an empiric antibiotic therapy with intravenous ceftriaxone and acyclovir was started, dexamethasone was also added. He was sent to pediatric intensive care unit for 4 days. Chest X-ray and brain computed tomography (contrasted) were normal.

A lumbar puncture was performed, and turbid fluid was obtained. Cerebrospinal fluid (CSF) analysis revealing white cell count 57/mm^3 (60% neutrophils), red cell count 36/mm^3, protein 12,2 mg/dl and glucose 33,1 mg/dL. Gram stain from cerebrospinal fluid showed Gram negative rods and cerebrospinal fluid cultures grew *S. paucimobilis;* peripheral blood cultures were negative. The patient was treated with ceftriaxone for a total of 14 days. The antimicrobial regimen was tailored accordingly. His mental status improved by hospital day 2 and continued to improve thereafter. Complete blood count returned to normal values the next day. He was discharged on hospital day 14 with a recovery back to his baseline except for a mild ataxia on lower limbs.

Discussion and Conclusion

Sphingomonas paucimobilis is a yellow-pigmented, aerobic, glucose non-fermenting, Gram-negative bacillus that is widely distributed in the natural environment such as in soil and water, and also has been isolated from hospital settings [1]. It was first described in 1977 and was named *Pseudomonas paucimobilis* but then was renamed *S. paucimobilis* [8]. Its virulence is thought to be low likely to the presence of atypical lipopolysaccharide components of the cellular membrane as well as deficiency in endotoxin activity [2].

Infections from *S. paucimobilis* could be both community and hospital acquired. In fact, some studies showed that community acquired infections are present in 50 - 55% cases, whereas the rest had health care-associated infections [8,9]. The most common comorbidities associated with *S. paucimobilis* bacteremia are malignancy (57,1%), immunosuppressant use (40,5%), and diabetes mellitus (11,9%) [2]. Despite the wide range of infectious manifestations, only four cases of meningitis due to *S. paucimobilis* has been reported [4-7] (Table 1). Recently, Göker., *et al.* [10] reported *S. paucimobilis* infection by in a patient with an external ventricular drain, however the diagnosis of meningitis was not made.

Country/ Ref	Age/sex	Immunological status	Symptoms/signs	CSF results	Treatment
United Kingdom [4]	39/male	Immunocompetent	Headache, neck stiffness, Kernig's sign, seizures (previous history of epilepsy)	WBCs* 200/mm^3 (95% lymphocytes), protein 40 mg/dL, glucose 67.2 mg/dL	Streptomycin, rifampicin, isoniazid
Malaysia [5]	31/male	Immunocompetent	Fever, headache, loss of appetite, weight loss, speech alterations, behavioral changes, neck stiffness	WBCs 210/mm^3 (78% neutrophils), protein 247 mg/dL, glucose 56 mg/dL	Ceftriaxone, acyclovir
United States [6]	39/female	Immunocompromised	Headache, dizziness, nausea, neck pain, gait imbalance, hyperreflexia, bilateral Babinski's sign	WBCs 781/mm^3 (64% neutrophils), protein 2798 mg/dL, glucose 18 mg/dL	Vancomycin, ceftriaxone, ampicillin
United States [7]	50/female	Immunocompetent	headache, dizziness, chills, shakiness, and neck pain, severe neck rigidity along with decreased range of motion	WBCs 5/mm^3 (4% neutrophils), RBCs** 95/mm^3, protein 37 mg/dL, glucose 60 mg/dL	Meropenem

Table 1: *Reported cases of meningitis caused by S. paucimobilis.*
**WBC: White Blood Cells; **RBC: Red Blood Cell.*

To our knowledge, this is the first case report in the literature of meningitis caused by *S. paucimobilis* infection in a pediatric patient. Most of the infections in this type of patients are community acquired and could be found in previously healthy children [3], which is in agreement with the clinical features of the present case. The most possible source of infection for our patient was from contaminated water, considering that the child was exposed to a pool days before the clinical presentation. Moreover, he was previously healthy and had not been on any antibacterial therapy, and it is therefore possible that initial entry into the body was through the gastrointestinal tract [4].

Aminoglycoside or third-generation cephalosporins have been recommended as suitable antibiotics for treatment of *S. paucimobilis* infection. However, a recent study in 24 children found that the most resistant pattern identified was against third-generation cephalosporin (20,9%), followed by ampicillin (12,5%) and amikacin (8,3%); carbapenems were the most effective antibiotic therapy [3]. The strain of *S. paucimobilis* isolated from our patient was found to be sensitive to cefoxitin, ceftazidime, ceftriaxone, ciprofloxacin, doripenem, imipenem, meropenem, gentamicin, piperacillin/tazobactam, and tigecycline, and resistant to amikacin, ampicillin/sulbactam, and colistin.

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Volume 11 Issue 2 February 2019