

Case Report

Spingobacterium multivorum causing fatal meningoencephalitis: a rare case report

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ABSTRACT

We report a case of fatal meningitis caused by bacteria, *Spingobacterium multivorum*, probably first time being reported from India. *S. multivorum* has been isolated from various clinical specimens but it is only rarely been associated with serious infections. *Spingobacterium* species are generally resistant to aminoglycosides and polymyxin B. Susceptibility to β -lactam antibiotics is variable, requiring testing for individual drug. This 36 year male had two weeks history of high-grade fever with altered sensorium and occasional seizures. Patient admitted with septicemia and subsequently developed meningitis and succumbed to his illness after being discharged against medical advice. His CSF culture yielded *S. multivorum* subsequently confirmed by mini API, bioMérieux Inc. Marcy-l'Etoile France. Due to its rare association with common clinical conditions, it requires a high degree of suspicion and expertise to prove its presence in clinical specimens. Since this bacterium is inherently resistant to many classes of antibiotics, a vigilant and efficient microbiological work up is needed to establish its diagnosis and prompt treatment.

Keywords: *Spingobacterium multivorum*, Meningitis, Septicemia, Mini API

INTRODUCTION

Spingobacterium multivorum (formerly, *Flavobacterium multivorum*) is a member of genus *Spingobacteriaceae*, an aerobic, yellow pigmented, non-motile, oxidase positive, indole negative, urease positive and gram-negative bacilli.

They are non-flagellated and may exhibit sliding motility. They are non proteolytic and produce acid from carbohydrates. They can be differentiated from closely related *Spingomonas paucimobilis* by lack of motility, urease production, and resistance to polymyxin B.¹

S. multivorum has been isolated from various clinical specimens but it is only rarely been associated with

serious infections.²⁻⁴ *Spingobacterium* species are generally resistant to aminoglycosides and polymyxin B. Susceptibility to β -lactam antibiotics is variable, requiring testing for individual drug.⁵

We report here a case of fatal meningitis caused by this bacteria, probably first time isolated from CSF.

This 36 years male had two weeks history of high-grade fever with altered sensorium and occasional seizures. Patient admitted with septicemia and subsequently developed meningitis and succumbed to his illness after being discharged against medical advice. His CSF culture yielded *S. multivorum* subsequently confirmed by mini API, bioMérieux Inc. Marcy-l'Etoile France.

Due to its rare association with common clinical conditions, it requires a high degree of suspicion and expertise to prove its presence in clinical specimens.

Since this bacterium is inherently resistant to many classes of antibiotics, a vigilant and efficient microbiological work up is needed to establish its diagnosis and prompt treatment.

CASE REPORT

A 36 year old male was admitted in ICU with complaints of fever for about two weeks, seizures and altered sensorium. Fever was mild to moderate and continuous and there were multiple episodes of seizures, with 1-2 minutes duration. There was no history of alcohol intake, trauma, jaundice and any chronic illness. Patient had long history of off and on local skin infections at multiple sites, which had character of delayed healing. General examination of the patient showed altered sensorium with GCS (Glasgow Coma Scale) of E1V2M2, bilaterally, pupil was slightly dilated and reacting. Plantar reflexes could not be elicited. Terminal neck rigidity was present but Kernig's sign was negative. Rest of the vital parameters were within normal limits except for the mild pallor. General investigations of the patient showed hemoglobin 7.5 gm/dl, total leucocyte count 7600/cmm, and differential leucocyte count Polymorphs 86%, Lymphocyte 10% Eosinophils 02 %, Monocytes 02%, Basophils 00%, Platelet count was 45000/cmm. He was negative for HIV, HBsAg, HCV, VDRL and also for Dengue IgM, IgG and NS1 antigen by rapid immunochromatographic tests as well as ELISA.

His serum urea was 51.3 mg/dl, serum creatinine 0.9 mg/dl, Serum Na⁺ 134.2 mmol/l and Serum K⁺ 4.5 mmol/l. CSF for Acid fast bacilli by Ziehl Neelsen Staining was reported negative. However peripheral blood smear showed multiple ring stages and sickle shaped gametocytes of *P. falciparum*. Rapid test for *P. falciparum* antigen was also positive. Patient was put on artesunate based combination therapy.

Patient did not improve as expected, but after five days of therapy his GCS was E2V4M4. Both smear and rapid test were negative for *P. falciparum*. Then the case was reviewed thoroughly and the below mentioned investigations were planned and the findings were as follows:

CSF analysis for protein and sugars was reported 70 mg/dl and 25 mg/dl respectively.

Corresponding random blood sugar was 120 mg/dl.

Serology for *Leptospira* was also reported negative.

CT brain was also done and was reported within normal limits.

Meanwhile his blood culture and wound swab were done which were reported positive for *Staphylococcus aureus*.

CSF was also sent for culture sensitivity, which showed growth of some non-fermenter. Upon Gram's stain of the culture, it revealed gram negative bacilli. Further identification of the culture by biochemicals, it was oxidase positive, nonmotile, indole negative, citrate negative, TSI K/K and Urease positive.

Culture was further processed in mini API bioMérieux Inc. Marcy-l'Etoile France, which showed 99% probability of *Sphingobacterium multivorum*.

This was sensitive to gatifloxacin only and intermediate sensitive to piperacillin-tazobactam. It showed resistance to ticarcillin-clavulanic acid, ceftriaxone, ceftazidime, cefipime, imipenem, meropenem, ofloxacin, cefpodoxime and cefoperazone.

Patient was immediately put on gatifloxacin. After a week, patient showed improvement in terms that his CSF was clear and culture sterile but proteins remained elevated and he was reported negative for malaria by same tests earlier done and smear was also reported negative for malaria parasite. His GCS also improved to E4V3M5 and he was discharged on patient's relatives request but against medical advice.

After a month time his death was informed by some of his relatives and also that he died at home.

DISCUSSION

S. multivorum is a ubiquitous Gram-negative saprophytic bacillus naturally present in the environment like soil, plant material, and water.⁶ It has been associated with septicemia in immunocompromised patients^{2,9,10} and respiratory tract infections in patients with cystic fibrosis.¹³ Cases of nonnecrotizing soft tissue infection due to other *Sphingobacterium* species have also been reported.^{8,14} In the present case, the patient was relatively immunocompromised by long duration of septicemia and non-healing wounds at many sites on the skin, and *S. multivorum* is a well-known risk factor for skin and soft tissue infection.¹²

Here in this case source of the pathogen could not be established but it is speculated that it was either environmental or commensal on patient's skin. This adds one more case to the spectrum of *S. multivorum* related infections and highlights the emergence of this gram-negative bacteria in meningitis and not only in soft tissue infections in immunocompromised patients,¹³ cases of septicemia.²

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REFERENCES

1. Paul C. Schreckenberger, Maryam I. Daneshvar, Dannie G. Hollis. *Acinetobacter, Achromobacter, Chryseobacterium, Moraxella and Other Nonfermentative gram negative rods.* In: Patric R. Murray, Ellen Jo Barren, James H. Jorgensen, Marie Louise Landry, Michael A. Pfaller, eds. *Manual of Clinical Microbiology.* 9th ed. Washington, DC: ASM Press; 2007: 539-560.
2. Fereny, Hansen W, Ploton C, Meugnier H, Madier S, Bornstein N, et al. Septicemia caused by *Sphingobacterium multivorum*. *J Clin. Microbiol.* 1987;25:1126-8.
3. Holmes B, Owen RJ, Weaver RE. *Flavobacterium multivorum*: a new species isolated from human clinical specimens and previously known as group IIK, biotype 2. *Int J Syst Bacteriol.* 1981;31:21-34.
4. Pot B, Gillis M. Genus III. *Aquaspirillum Hyelomon*, Wells, Krieg and Jannasch 1973b, 361^{AL}. In: Brenner DJ, Krieg NR, Staley JT, Garrity GM, eds. *Bergey's Manual of Systematic Bacteriology.* 2nd ed. New York, NY: Springer; 2005: 801-823.
5. Spangler SK, Visalli MA, Jacobs MR, Appelbaum PC. Susceptibilities of non-*Pseudomonas aeruginosa* gram negative non-fermentative rods to ciprofloxacin, ofloxacin, levofloxacin, D-ofloxacin, sparfloxacin, ceftazidime, piperacillin, piperacillin-tazobactam, trimethoprim-sulfamethoxazole, and imipenem. *Antimicrob Agents Chemother.* 1996;40:772-5.
6. Reina J, Borrell N, Figuerola J. *Sphingobacterium multivorum* isolated from a patient with cystic fibrosis. *Eur J Clin Microbiol Infect Dis* 1992;11:81-2.
7. Grimaldi D, Bonacorsi S, Roussel H, Zuber B, Poupet H, Jean-Daniel Chiche, et al. Unusual "flesh-eating" strain of *Escherichia coli*. *J Clin Microbiol.* 2010;48:3794-6.
8. Marinella MA. Cellulitis and sepsis due to *Sphingobacterium*. *JAMA.* 2002;288:1985.
9. Manfredi R, Nanetti A, Ferri M, Mastroianni A, Coronado OV, Chiodo F. *Flavobacterium spp.* organisms as opportunistic bacterial pathogens during advanced HIV disease. *J Infect.* 1999;39:146-52.
10. Potvliege C, Dejaegher-Bauduin C, Hansen W, Dratwa M, Collart F, Tielemans C, et al. *Flavobacterium multivorum* septicemia in a hemodialyzed patient. *J Clin Microbiol.* 1984;19:568-69.
11. Winthrop KL. Serious infections with antirheumatic therapy: are biologicals worse? *Ann Rheum Dis.* 2006;65(Suppl 3):iii54-7.
12. Anaya DA, Dellinger EP. Necrotizing soft-tissue infection: diagnosis and management. *Clin Infect Dis.* 2007;44:705-10.
13. Lambiase A, Rossano F, Pezzo MD, Raia V, Sepe A, Gregorio FD, et al. *Sphingobacterium* respiratory tract infection in patients with cystic fibrosis. *BMC Res Notes.* 2009;2:262.
14. Tronel H, Plesiat P, Ageron E, Grimont PA. Bacteremia caused by a novel species of *Sphingobacterium*. *Clin Microbiol Infect.* 2003;9:1242-4.

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