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CLINICAL VIGNETTE

A Case of Stenotrophomonas Maltophilia Bacteremia

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Case Report

A 39-year-old woman with medulloblastoma status post partial resection and radiation, currently on chemotherapy, presented to the hospital due to fatigue. She was in a normal state of health until a year prior when she developed difficulty with speech and coordination. An MRI done at that time showed enhancement in the cerebellum. She then underwent resection by Neurosurgery with pathology showing malignant medulloblastoma. Whole body imaging showed no evidence of metastasis, and she subsequently received treatment with multiple rounds of chemotherapy with high-dose cyclophosphamide, cisplatin, vincristine, and mesna with her last dose a week prior to admission. Since her last chemotherapy dose, the patient had progressive fatigue and generalized weakness. In addition, she had decreased oral intake for the two days prior to admission. Finally, she also complained of a non-productive cough, and on the day she came to the ER, she had a fever at home of 103.4ºF. She denied nausea, vomiting, abdominal pain, diarrhea, chest pain, headache, neck stiffness, mouth ulcers, throat pain, recent travel, or sick contacts.

In the Emergency Room, the patient was found to be pancytopenic and received 2 units of packed red blood cells for a hemoglobin of 7.1 and 1,000 mg of acetaminophen, cefepime IV, levofloxacin IV, vancomycin IV, and a normal saline bolus. A chest X-ray was unremarkable. Coverage was broadened to include meropenem once labs came back with neutropenia with a white blood cell count of 0.1 with 56% neutrophils. Finally, she had platelets of 7. She was given GCSF with an improvement in her absolute neutrophil count over the next few days. Labs were otherwise unremarkable. She remained hemodynamically stable, and on hospital day 2 her blood cultures returned positive for a gram negative rod, which ultimately speciated as *Stenotrophomonas maltophilia*, which was sensitive to both trimethoprim-sulfamethoxazole (TMP-SMX) and levofloxacin. Induced sputum culture was negative. Of note, the patient was quite anxious and depressed initially because of her medical and psychosocial issues including family conflicts, and therefore, Palliative Care was consulted. Infectious Disease recommended levofloxacin. The patient's fatigue and cough resolved while in the hospital. A family meeting was arranged, and she was provided with on-going palliative support, which has enhanced her remarkable recovery. Follow-up blood cultures remained negative. She was discharged home to finish a course of levofloxacin. One month later, the patient is doing well from an infectious standpoint.

Discussion

Stenotrophomonas maltophilia is an aerobic, gram-negative bacillus that is an opportunistic pathogen among hospitalized patients. Originally named *Bacterium booker* in 1943 when it was first isolated, the bacilli moved through several taxonomic families before finally ending up in *Stenotrophomonas* in 1993. The genus *Stenotrophomonas* contains four organisms, but only *S. maltophilia* is known to cause infection in humans.[1] Closely related to *Pseudomonas*, it is inherently resistant to multiple antibiotics. It is found in water, soil, and plants in the environment, and in a hospital setting, it has been found on multiple medical devices, sterile water, and impressively even in chlorhexidine disinfectant.[2]

It can be very difficult clinically to differentiate infection and colonization. As an infection, it most commonly presents as either pneumonia or bacteremia, but it can also cause endocarditis, meningitis, urinary tract infections, and soft tissue infections.[3] Although not usually highly virulent, in an immunocompromised patient attributable mortality has been estimated to be between 20-30%, a number similar to other nosocomial sources of bacteremia.[4] In addition, *S. maltophilia* can form biofilms, which can make it more resistant to phagocytosis and antibiotics.[5] Interestingly, *S. maltophilia* engages in cell-to-cell signaling, or quorum sensing, in an unusual manner compared to other gram negative bacteria. Instead of the LuxIR system, *S. maltophilia* uses the diffusible signaling factor (DSF) molecule that is also used by the plant pathogen genus *Xanthomonas* (the genus it had been classified in prior to 1993).[6] Furthermore, *S. maltophilia* interactions with *Pseudomonas* can lead to modification of *Pseudomonas'* own biofilm and even tolerance to polymyxin.[7] *S. maltophilia* can colonize the respiratory tract and plastic surfaces such as catheters. This is thought to be mediated by flagella-like structures that allow the bacteria to adhere.[8]

Classically, TMP-SMX has been considered the agent of choice for treatment; however, there are also case reports of *S.*

maltophilia resistant to TMP-SXM.[9] Through a variety of mechanisms, *S. maltophilia* is usually resistant to beta-lactams, aminoglycosides, and macrolides, as well as showing variable resistance to fluoroquinolones.[10] Our patient's *S. maltophilia* showed sensitivity to both TMP-SMX and levofloxacin. Given her pancytopenia, the decision was made to treat with levofloxacin instead of TMP-SMX due to concern for bone marrow suppression. The patient has tolerated the treatment well and is doing well clinically to date.

Patients suffering from life-limiting illnesses may have significant psychosocial issues and can at times decline simple life saving treatments. These patients should be evaluated for depression and offered supportive services to enhance their quality of life as well decision making capacity.

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