SHARE

MORNING REPORT

An Unusual Presentation of a MAC Infection

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The patient is a 28-year-old woman with past medical history of AIDS and pancytopenia who is directly admitted due to elevated liver function tests. She feels well except for chronic low back pain. She denies fever, chills, shortness of breath, abdominal pain, nausea, vomiting, diarrhea, and weight loss. The patient has not been compliant with her medications.

The differential diagnosis for asymptomatic abnormal liver function tests in an immunocompromised patient is broad. It is important to clarify whether the problem is transaminitis (elevated AST and ALT), a biliary tract problem (with elevated bilirubin and/or elevated alkaline phosphatase), or a problem with the synthetic function (as evidenced by high INR and/or low albumin). Given her history of being immunocompromised with AIDS (which is a T cell abnormality), she is at risk for both opportunistic infections and traditional infections such as cholecystitis. The degree of immunocompromise would be reflected by her CD4 count. Back pain, though chronic and very common, may also be an important sign as osteomyelitis, and epidural abscess may be in the differential diagnosis.

The patient has AIDS, which was diagnosed in November 2002. Antiretrovirals were started in September 2013. Her course was complicated by pneumocystis jiroveci pneumonia and herpes simplex virus (HSV) esophagitis in November 2012, candida esophagitis in February 2013, and mycobacterium avium complex (MAC) infection in March 2013.

This history of multiple opportunistic infections, especially with the patient's noncompliance, makes me worry about a patient who is severely immunocompromised and therefore at risk for opportunistic infections such as pneumocystis, candida, HSV, and MAC. However, the patient is relatively asymptomatic—she has no shortness of breath to point to pneumocysists and no esophagitis making candida and HSV less likely. MAC is still a possibility, and knowing the CD4 count will be important as MAC is less likely if the CD4 count is greater than 50.

The physical exam is notable for a temperature of 98.3 F, blood pressure 93/62, heart rate 118, respiratory rate 18, and oxygen saturation 100% on room air. The patient in general appears comfortable and has a normal head, ear, nose, throat, neck, lung, abdomen, and neurological exam. She is noted to be tachycardic with a regular rhythm without murmur; her skin exam shows multiple tattoos.

Although the patient appears comfortable, her tachycardia and hypotension make me worry about a systemic inflammatory response syndrome secondary to infection. There is no obvious pulmonary abnormality or abdominal finding (though she had elevated LFTs). Additional lab values including CBC with differential, creatinine, blood cultures, urine culture, and CD4 count should be obtained next. It may be necessary to start IV fluids and antibiotics and review the LFTs that are abnormal.

Lab values are notable for a white blood cell count of 0.5, hemoglobin 9.8, hematocrit 31, and platelet count of 98. CD4 count is 4 with a viral load of 3,140,886. BMP is normal. Other findings include: AST 873, ALT 183, alkaline phosphatase 823, total bilirubin 0.6, albumin 3.2, total protein 7.4, and calcium 8.5.

These values confirm that the patient is severely immunocompromised—especially with CD4 count of 4. Her liver function tests are significant for fairly preserved synthetic function but abnormal transaminases. It will be important to check for hepatitis A, B, and C; Epstein Barr virus; blastomycosi; histoplasmosis; RPR; and cryptosporidium given her immunocompromised state. Also, I would consider ordering a CT of the abdomen to look for focal liver abscesses.

All laboratories are negative except for blood cultures that are positive for acid fast bacilli (AFB). CT of the abdomen shows no focal hepatic lesions, patent hepatic and portal veins, and normal pancreas. Given the positive AFB, a chest x-ray is done that shows only small lung volumes. A liver biopsy is done that shows granulomatous hepatitis with acid fast bacilli, and a bone marrow biopsy shows hypocellular bone marrow with non-necrotizing granulomatous inflammation with acid fast positive organisms.

The most common symptoms of disseminated MAC are fevers, night sweats, abdominal pain, diarrhea, and bone marrow suppression. Although MAC organisms are ubiquitous in the environment, MAC can be life threatening when infection is caused by M. avium *or* M. intracellulare. *This patient is at high risk for this because she has had past MAC and her CD4 count is less than 50.*

The patient is treated with azithromycin, rifabutin, and amikacin.

continued on page 2

She remains asymptomatic over her hospital course, and her transaminitis improves with initiation of therapy. AST decreases to 424 and ALT to 81.

For disseminated MAC, at least two drugs are required to decrease the risk of resistance and improve the clearance of MAC. First-line agents are clarithromycin or azithromycin. Second-line agents are ethambutol +/- rifabutin. There is improved survival with rifabutin; however, there are many side effects and drug interactions. Third-line agents are amikacin or streptomycin. These are used when a patient has advanced immunosuppression and high mycobacterial loads or in the absence of effective HAART. Treatment should last at least 12 months.

Take Home Points

1. Disseminated MAC (DMAC) in HIV patients typically occurs after CD4 drops to less than 50 cells/mm^3.
   - DMAC usually involves the GI or respiratory tract.
   - Bone marrow involvement is rare.
   - Most common symptoms are non-specific.
2. First-line Treatment
   - Clarithromycin/azithromycin and ethambutol (+/- rifabutin)
   - Third line agents if needed (amikacin, streptomycin)

Suggested Reading

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