Best Practices in Management of Histoplasmosis: Emergency Medicine Perspective

Introduction: Thank you for participating in this course, *Best Practices in the Management of Fungal Pneumonias: Primary Care and Emergency Medicine Perspectives*. In this section, we talk with Dr Jessica Pelletier, an emergency medicine physician at the University of Missouri, about the management of histoplasmosis.

Q: Please tell us about your background in emergency medicine.

Dr Pelletier: I am currently an assistant professor of emergency medicine and assistant residency program director at the University of Missouri, Columbia. Before I arrived at Mizzou, I was a medical education fellow for 2 years at Washington University in St. Louis. Before that, I did my emergency medicine residency at Virginia Tech Carilion in Roanoke, Virginia.

Q: Great, thank you. How did you become interested in histoplasmosis management?

Dr Pelletier: Dr Stephen Liang, who works at Washington University in St. Louis, is triple boarded in emergency medicine, infectious diseases, and internal medicine. During my medical education fellowship, he was doing a quality improvement project to ensure that we were thinking about and testing for endemic mycosis at Wash U. Participating in that initiative really got these endemic (dimorphic) mycoses on my radar, and I started thinking about them more in my clinical practice.

Q: How did you learn about fungal pneumonias in general?

Dr Pelletier: A bit of it was education provided to us at Wash U by Dr Steven Liang. And then I've tried to listen to whatever podcasts are available on this topic and then read up on my own time on the Centers for Disease Control and Prevention (CDC) and World Health Organization (WHO) websites. I think this is a larger problem than people recognize, and we're not testing for it as often as we should. We've definitely had some patients show up to the emergency department who we've later found to have fungal pneumonia. So, this is something that can be easily missed.

Q: In your view, why is it important to take a proactive approach to managing these infections?

Dr Pelletier: We see patients all the time who are incredibly frustrated because they can't seem to get a diagnosis, and they're just not getting better. And I think that's an opportunity for us to think more broadly and to not narrow our differential but rather broaden it and consider other things in the environment that could be causing the patient's symptoms. For example, just yesterday I had a patient coming in who worked in a lime mine in southern Missouri, and we have to think about these environmental exposures that put people at risk for different infections that we might not normally see. We need to be thinking about the zebras and not just the horses when it comes to our differential.

Q: Great. That's a wonderful analogy. We have talked about the CDC testing algorithms. How closely do you follow those algorithms now that you're more educated about these pneumonias?

Dr Pelletier: Yes, that's a great question. The one frustrating thing is that my institution doesn't have any of these labs, so they're all send-out labs that have to go to another institution and take many days to come back. And technically, we're supposed to be sending the enzyme immunoassay urine antigen test. I don't think we even have that at my institution. We have a serum polymerase chain reaction (PCR) test and serum antigen that we can send out, and those don't come back for days. And so I have to work with what I have available to me in my system. So, where possible, I follow the CDC algorithms, but we don't necessarily always have the appropriate tests available where I work.

Q: Thank you for that. And I think you've outlined some of your diagnostic processes, but can you take us through it a little more? What is your diagnostic process in general?

Dr Pelletier: Let's say I have someone coming in with persistent respiratory symptoms, for example, more than 4 to 6 weeks of bronchitis symptoms, and they don't have typical bronchitis auscultation findings on my exam, like wheezing or rhonchi. So if they're coming in with rales, and they don't have a chronic respiratory history like interstitial lung disease, they don't have autoimmune disease, and they just have these persistent symptoms that aren't getting better, especially if they've failed multiple courses of antibiotics designed to treat atypical pneumonia like *Mycoplasma*, then I start thinking more about atypical infections like fungal pneumonia. And at that point I'll send off histoplasmosis testing, blastomycosis testing. I don't work in an area where coccidioidomycosis is very common, so that's not something that I'm sending in my area, but histoplasmosis and blastomycosis, absolutely. And my institution has the PCR testing available for histoplasmosis and blastomycosis; we have the quantitative antigen as well.

And again, because there's a long delay between when I send a lab and when it comes back, I will often send all of those and then also give the patient an infectious diseases referral. While we have a nurse follow-up line from the emergency department, they're usually used to seeing things like chlamydia tests and syphilis tests coming back positive. I'm not sure that there's anyone who can actually follow-up if these tests come back positive. So, I'd rather these folks have an infectious diseases follow-up appointment to make sure that someone follows up to make sure that these fungal tests come back negative.

Q: So it sounds like, in your practice, you're not necessarily managing any of these patients, but can you tell us a little bit more about that follow-up process and how you get them referred to infectious diseases?

Dr Pelletier: Like you said, I'm not typically identifying the definitive infection in the emergency department because there's a long delay between when we send these tests and when the patient gets diagnosed. Alternatively, if someone's critically ill, they're going to get a bronchoscopy in the intensive care unit (ICU) after I admit them, after I've intubated them. And then a few days later we'll find out what actually caused their underlying respiratory failure. But in terms of the follow-up process, our nurse follow-up line doesn't necessarily know to follow-up on positive blastomycosis and histoplasmosis testing. That's just not within their algorithm or their scope. And so, if those things come back positive, I need to make sure that someone follows up with the patient. So, I give them a follow-up phone number for infectious diseases, and I tell them to give that office a call and make an appointment.

Q: I think that was really interesting talking about the scope of practice for those nurses who do follow-up. Thank you for that. Have you ever been involved with a fungal outbreak? And if so, can you tell us about that experience?

Dr Pelletier: We haven't had any large-scale outbreaks since I've been at this institution. I know when I was at Wash U and Steven Liang was working on our quality improvement project, we were definitely seeing a lot more positive results for blastomycosis and histoplasmosis than we were expecting. And so, we just continued to send more referrals to infectious diseases. We did have a recent patient with disseminated histoplasmosis in our emergency department at Mizzou. One of my emergency medicine residents took care of this patient in the emergency department, and then one of our other residents took care of them when they went upstairs to the ICU. That patient did have some pretty clear exposure history as a construction worker. And that's always a red flag for me. Respiratory symptoms plus exposure to construction sites, dirt, caving, any of those kinds of activities, we have to think more about these fungal infections.

Q: That's great, you reiterated some of the special clues that you can think of in terms of exposure history, which is very helpful. But as you know, these infections are often overlooked and underdiagnosed. What can you tell your fellow emergency medicine providers about the best practices to ensure early diagnosis and effective management? And I think you mentioned some of the special clues. Are there any other special clues that you think of when you look at these patients?

Dr Pelletier: Yeah, I think we often overlook that environmental history for patients and we forget to ask them if they've traveled anywhere recently, if they live on a farm, if they're working in construction, if they have different hobbies, like they spend their weekends in caves and things like that. We need to start asking more of those questions for patients presenting with respiratory symptoms, especially when they're persistent or they're atypical and don't match a normal pattern that we would see for bacterial pneumonia. This can happen to any patient, not just someone who's immunocompromised. The patient that we had with disseminated histoplasmosis recently at Mizzou did not have any compromising risk factors. And so, we just need to be taking a better exposure history for people coming in with respiratory symptoms.