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Exploring Approaches to Management for Bronchiectasis

Announcer:
You are listening to *Deep Breaths: Updates from CHEST* on ReachMD. This series is produced in partnership with the American College of Chest Physicians, and this episode is sponsored by Insmed Incorporated. Your host is Dr. Christopher Lippincott, an Assistant Professor of Medicine at the Johns Hopkins University School of Medicine.

Dr. Lippincott:
Welcome to *Deep Breaths: Updates From CHEST* on ReachMD. I'm Dr. Christopher Lippincott, and joining me today is Dr. Ashwin Basavaraj. He's an Assistant Professor of Medicine at NYU Grossman School of Medicine, and the Associate Director of the Bronchiectasis and NTM Program at NYU Langone. Today, we're going to take a look at the management of bronchiectasis and the burden of bronchiectasis-brought exacerbations.
Dr. Basavaraj, welcome to the program.
Dr. Basavaraj:
Thank you so much, Dr. Lippincott. It's a pleasure to be here.
Dr. Lippincott:
Fantastic. Well, let's dive right into the management of bronchiectasis. Dr. Basavaraj, what kind of management approach is recommended for this condition?
Dr. Basavaraj:
Yeah, Dr. Lippincott, great question here. So, I think in terms of management approaches, I think it's important to try to identify potential etiologies of the bronchiectasis. For example, patients may have autoimmune conditions, they can have immunoglobulin deficiencies that may be associated with their bronchiectasis. [1] They can have conditions that cause inflammation secondary to fungal colonization, so for example, ABPA, or allergic bronchopulmonary aspergillosis. [2] There are genetic conditions that a patient with bronchiectasis may present with, such as alpha-1 antitrypsin deficiency, cystic fibrosis, primarily ciliary dyskinesia, and there could be a number of other conditions, such as reflux, aspiration, sinus issues, swallowing abnormalities, that all may help to perpetuate the progression of bronchiectasis, and it's important to try to identify these comorbidities and manage them appropriately to try to prevent the bronchiectasis from worsening.[1,2]
Now, when a patient has bronchiectasis, we know that by definition, the airways are dilated and that could lead to mucus plugging or a stagnation of mucus and impaired mucociliary clearance.[1] That can lead to chronic infections, inflammation, and worsening bronchiectasis in a vicious cycle or a vicious vortex model.[2] So we want to try to prevent this from occurring and try to break this vortex as best possible, and one of the mainstays of management of patients with bronchiectasis to help with that are airway clearance techniques.[2] There are a number of modalities out there to try to help with airway clearance and that's positive expiratory pressure devices, high-frequency chest-wall oscillation therapies. There are manual techniques, such as active cycle breathing techniques, cough or huffing techniques, and exercise also is very important, that can help in terms of airway clearance in these patients.[1] There's also mucoactive therapy, such as hypertonic saline, that could be utilized in conjunction with these airway clearance techniques to try to help mobilize mucus out of airways.[3]
Now when we have patients with bronchiectasis, we know that they're susceptible to a number of infections, most commonly in the United States, nontuberculous mycobacterial infection.[4] There could be other resistant organisms, such as *Pseudomonas* or MRSA, and we want to try to treat these infections appropriately, especially if patients are symptomatic and they're worsening on airway clearance techniques alone.[4]
Dr. Lippincott:
That's brilliant, Ashwin, and I think really nicely highlights the complexity of managing patients with bronchiectasis and the fact that a one-size-fits-all approach doesn't really apply to this condition.
So, why is it important to address all aspects of this vicious cycle of cascading mediators that lead to bronchiectasis and exacerbations, as opposed to focusing solely on airway clearance or infection control as needed?

Dr. Basavaraj:
Yeah, that's a very important question, Chris. The idea of the vicious cycle, where we have four components in the pathophysiology of bronchiectasis, can be described as a patient has bronchiectasis from an underlying etiology that may lead to impaired mucociliary clearance, and stagnation of mucus, which is a setup for chronic infections, inflammation, and that perpetuates further destruction in bronchiectasis in this vicious cycle.[5] But we've come to realize that the components are not all separate, and they're interconnected into more of like a vicious vortex model, where even stopping one of these steps may not be enough, and you really need to try to target multiple steps to try to help prevent progression of bronchiectasis. So it's very important to not only address airway clearance and mucociliary clearance, but it's important to address infections and treatment if necessary. It's important to address inflammation. That treatment, as part of the whole vicious cycle and vicious vortex, should be treated as a whole,[5] so, to try to prevent progression of the bronchiectasis. Now, when we talked about a lot of the components of the vicious cycle, and inflammation is a key component, right?[2] We want to try to treat inflammation as best possible, recognize exacerbations when inflammation may be increased, and treating it appropriately and trying to recognize it from other conditions that can mimic bronchiectasis exacerbations, such as COPD and asthma exacerbations.[5] So it's very important to try to address all aspects of this vicious vortex to treat the patient with bronchiectasis and try to prevent them from progressing.[6]

Dr. Lippincott:
That's great. Yeah, that I completely agree, as I'm sure we've both seen, if you aren't addressing all aspects of these sort of mediators that are triggering bronchiectasis and exacerbation, patients just don't get better. So that's great, thank you.
For those just tuning in, you're listening to *Deep Breaths: Updates From CHEST*. I'm your host, Dr. Christopher Lippincott, and joining me is Dr. Ashwin Basavaraj to discuss managing bronchiectasis.
So Dr. Basavaraj, now that we've explored management options, let's take a look at the impact on patients. Can you tell us about the burden of exacerbations on our patients? What are some of the primary consequences of those exacerbations?

Dr. Basavaraj:
Yeah, this is a great question. We know that bronchiectasis by itself can worsen quality of life in patients that have it, especially if it's not being managed appropriately. This leads to chronic symptoms. It leads to chronic outpatient visits, not just with their primary provider but a number of other providers that may be involved in the care of patients with bronchiectasis. That may lead to frequent outpatient visits; frequent treatments at home; the need to utilize airway clearance, nebulizers, inhaled antibiotics to try to suppress exacerbations.[7] That all takes a toll on a patient, and we want to try to reduce the impact on quality of life as best possible. Specifically with exacerbations, we know that when a patient has a bronchiectasis exacerbation, it can lead to worsening symptoms, has an impact on pulmonary function, a worsening quality of life, and may potentially have an impact on morbidity and mortality.[8] So, it's important to recognize a bronchiectasis exacerbation when a patient has it, and try to treat it appropriately, but also, try to prevent these exacerbations from even happening.[8] And there's a number of modalities out there, for example, macrolide therapy, to try to help suppress exacerbations in patients with bronchiectasis.[9] If they don't have any underlying NTM. Inhaled antibiotics have been used also to try to suppress exacerbations, specifically if they're colonized with resistant organisms.[9] So those are all different approaches to try to prevent the exacerbations. And we want to try to reduce the susceptibility of future infections, right?
So we know that exacerbations can lead to repeated steroid use. For example, if they get misdiagnosed as COPD and asthma exacerbations, they may be prescribed steroids if they're coughing, if they're wheezing, and that long-term repeated use can lead to side effects associated with steroids.[10] And patients oftentimes get antibiotics when they have exacerbations to try to target the resistant organisms. But we know that repeated use of antibiotics may lead to resistance, may lead to side effects, right?[10] So, if we can try to treat these patients with bronchiectasis and suppress these exacerbations, we may even be able to help prevent patients from utilizing recurrent steroids and recurrent antibiotics and try to prevent those side effects from occurring.

Dr. Lippincott:
That's great. And I appreciated your comment on how these exacerbations and the management of bronchiectasis can really impact the quality of life of our patients.[8,11] I think it's common in my practice where I see a new patient, and they're really just sort of demoralized and exhausted in dealing with their symptoms and their bronchiectasis, in part because they aren't getting all of the, sort of, management that they need. And they don't have an understanding of what's actually going on behind the scenes. So totally agree with all that you said there.
So with that in mind, what can we do to help prevent these exacerbations?

Dr. Basavaraj:
Great question. There are a number of modalities to try to help prevent these exacerbations. We want to try to target the vicious vortex and try to prevent the progression of bronchiectasis in these patients, and one of the mainstays of treatment is airway clearance techniques that we discussed. There's also mucoactive therapy, such as hypertonic saline nebulizers, that can be used in conjunction with these airway clearance techniques, and just trying to help relieve the mucus, and might help in terms of reducing their inflammation, their infectious burden, and try to prevent these exacerbations from occurring.[3] With that, there are logistics in terms of utilization of airway clearance. We want to make sure a patient is trained appropriately, either by their providers or by a trained chest physiotherapist. They may need access to chest physiotherapy centers that can help provide reinforcement of the airway clearance techniques and potentially enroll them into pulmonary rehab programs to reinforce exercise. There may be travel needs with these airway clearance techniques that patients need to think about. So those are some of the logistics in terms of airway clearance. We talked about antibiotics. Patients, when they have these exacerbations, may benefit from a chronic macrolide, specifically if they do not

have NTM as part of their bronchiectasis.[1] The macrolide may be an anti-inflammatory technique that can help prevent these exacerbations from occurring.[10] Antibiotics, inhaled antibiotics, specifically if they're colonized with bacteria such as MRSA or *Pseudomonas*. These inhaled antibiotics, when given, may help prevent these exacerbations from occurring, and sometimes patients require treatment of their infection, either by oral antibiotics or IV antibiotics.
They have to be at home administering the intravenous antibiotics and utilizing their airway clearance techniques. So it's really important to treat these exacerbations comprehensively, with an interdisciplinary team, and try to help improve the disease management of these patients.

Dr. Lippincott:
Well, that's great, you've really nicely outlined sort of the spectrum of the tools in our toolbelts here, and it's definitely a lot that's asked of our patients, but really important, and I appreciated the comment on the multidisciplinary approach. I would echo that as well.
Finally, Dr. Basavaraj, do you have any key takeaways you'd like to share with our audience?

Dr. Basavaraj:
For sure. I mean, I think it's important, obviously, to diagnose our patients with bronchiectasis, manage them appropriately with airway clearance techniques, but also recognize when an exacerbation may be occurring, because we know that management is unique to these patients with bronchiectasis exacerbations compared to other pulmonary etiologies such as COPD and asthma. So, just very important to manage it and recognize it appropriately.

Dr. Lippincott:
Well, thank you for a great conversation. I want to thank my guest, Dr. Ashwin Basavaraj, for joining me today to discuss bronchiectasis management. Dr. Basavaraj, it was great speaking with you today.

Dr. Basavaraj:
Thanks so much, Dr. Lippincott. It was great being here.

Dr. Lippincott:
I'm Dr. Christopher Lippincott. Thanks for listening.

Announcer:
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