

Transcript Details

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Predicting and Preventing COPD Exacerbations

Announcer:

You're listening to *On the Frontlines of Obstructive Lung Diseases* on ReachMD. Here's your host, Dr. Shelina Ramnarine.

Dr. Ramnarine:

This is *On the Frontlines of Obstructive Lung Diseases* on ReachMD, and I'm Dr. Shelina Ramnarine. Joining me to discuss predicting, preventing, and managing exacerbations in chronic obstructive pulmonary disease, or COPD, is Dr. MeiLan Han. She's a Professor of Medicine and the Chief of the Division of Pulmonary and Critical Care at the University of Michigan Health. Dr. Han, welcome to the program.

Dr. Han:

It's great to be here. Thank you.

Dr. Ramnarine:

To begin, Dr. Han, what happens physiologically during a COPD exacerbation, and why do exacerbations matter so much for a patient's overall disease trajectory?

Dr. Han:

Yes, that's a really great question. So an exacerbation is essentially an acute increase in airway inflammation. It can be triggered by a virus, bacteria, or—this summer, for instance, with the Canadian wildfires—it could be air pollution. But when that inflammation increases, it results in increased mucus production, airway narrowing, and gas trapping. So patients suddenly have a lot more difficulty breathing.

And the reason why an exacerbation is important is not just that acute window when they're feeling badly, but it's also that some patients, first, never fully recover to their prior baseline. They are associated with increased risk of subsequent events, and sometimes, the events can actually be quite severe, like hospitalizations leading to increased mortality.

They've also been associated with more rapid lung function declines. So, when we start thinking about these beyond just that individual event, they unfortunately can have a significant impact on the patient's overall course of disease progression. And that's why, as a pulmonologist, trying to figure out how to not just treat these events but prevent these events is such an important focus for us.

Dr. Ramnarine:

We know that exacerbation frequency varies a lot, even between patients with similar spirometry. So what do we currently know about predicting exacerbation risk, whether that's through biomarkers, phenotyping, prior history, or other factors?

Dr. Han:

So this has been an area of really intense research, and while it sounds disappointingly simple, it turns out that—in multiple studies and multiple models—the answer is actually the same, and that the single best predictor of having a future event is having had one before. It's so simple, but that is still our single best predictive indicator.

Now, beyond that, there are other factors that we know are associated with increased risk. That includes increased symptoms, more severe airflow obstruction, certain measures of systemic inflammation, as well as comorbidities.

We're also learning a lot about imaging biomarkers right now. That's a very intense area of investigation, including things like mucus plugging. But, in practice, one of the other things I would probably point physicians to are blood eosinophils. They're not perfect, but they

definitely help to identify a subtype of patient with type two inflammation that maybe were more responsive to both inhaled steroids, as well as people that would be more responsive to some of the biologics we now have on the market that target type two inflammation.

Dr. Ramnarine:

So, taking that a step further, what are the earliest indicators of an impending exacerbation, and how reliably can we identify them before symptoms escalate?

Dr. Han:

Exacerbations are tough, because we don't have a single blood test to tell us that one has happened. And so, really, we depend on patients to tell us that they've noticed that their breathing is different from their usual pattern and that it's sustained beyond just day-to-day variation. And those symptoms could be increased breathlessness, increased cough, change in sputum color, or change in sputum volume.

But there's a lot of research right now into things like digital monitoring, wearables, et cetera, as to whether subtle changes in respiratory rate, heart rate, oxygen saturation, or even the content of exhaled breath could potentially indicate a super early change that the patients maybe don't even recognize themselves. But we're really not quite there yet. That's still in the research world.

So I think the message for people right now is that patients themselves really are the best leading indicator for whether they're having an event. And if they see that they're, for instance, needing their inhaler more frequently, or they have a sustained change in symptoms, then I encourage patients to let us know, so we can get them started on treatment.

That whole concept is wrapped up in the idea of COPD patients having an action plan. They know what symptoms to monitor for. They perhaps have some instructions on how to change their inhalers, but also to call their doctor and let somebody know so they can get appropriate treatment.

Dr. Ramnarine:

For those just tuning in, you're listening to *On the Frontlines of Obstructive Lung Diseases* on ReachMD. I'm Dr. Shelina Ramnarine, and I'm speaking with Dr. MeiLan Han about effectively reducing and managing COPD exacerbations.

So, Dr. Han, let's shift gears now and talk about management. How do you approach treatment escalation for patients with recurrent exacerbations?

Dr. Han:

So I think the first thing is just to make sure that you're actually dealing with COPD exacerbations, and that it's not undiagnosed heart failure, chronic infection, their disease course being complicated by something like bronchiectasis, et cetera. So you may want to consider checking a CT scan or double-checking heart function, et cetera.

Then, the next easy thing is to make sure that they're actually taking the medications you think that they're taking in the way that they should be taking them. So, for instance, I just had a patient referred to me where, in theory, on paper, it looked like the patient was failing triple inhaled therapy. But when I spoke with them, they said, "Oh, I never started that medication. And actually, of the other medications I have, I'm really only using this one inhaler." And then he said, "And I didn't start this new one that they prescribed, because nobody ever showed me how to use it." So that's a perfect example of just going back to the basics. So I walked him through, we need this one and not that one, and then we actually did some in-office education on inhaler technique.

Most patients who are having frequent exacerbations should be on triple inhaler therapy. This consists of a long-acting beta agonist and a long-acting muscarinic antagonist. And then, if the eosinophils are 100 or more, they should also be on an inhaled steroid. But that's the majority of patients, unless they don't tolerate one of those elements for a specific reason.

And then, if the patients are still exacerbating, we have options. So, for patients who have eosinophils roughly in that 300 or more range, the GOLD document suggests that either dupilumab or mepolizumab—which are both biologics targeting type two inflammation—are potential options.

But, for other patients, we've also got roflumilast, which is a PDE3/PDE4 inhibitor that really is helpful for patients with lower levels of lung function, frequent exacerbations, and symptoms of chronic bronchitis. Another option is azithromycin, which is particularly helpful in former smokers.

We have options. I think the good news is that there are quite a few new treatments that are being investigated, and I suspect that even within the next year, we'll have even more options available.

Dr. Ramnarine:

Now, what role do non-pharmacologic interventions like vaccination, pulmonary rehab, smoking cessation, and environmental factors play in exacerbation prevention relative to medication?

Dr. Han:

This is obviously extremely important. Obviously, vaccinations reduce infectious triggers that account for many exacerbations. And so GOLD recommends flu, but then we also have COVID, RSV, shingles, and pneumonia vaccinations. There's quite a few that potentially can prevent respiratory pathogens that can trigger exacerbations.

There is some evidence that pulmonary rehab not just improves exercise tolerance and quality of life, but actually can potentially help reduce exacerbations, in particular following a severe event and a hospitalized exacerbation.

Avoiding environmental exposures where you can is probably something that we don't talk about enough, but it's definitely something that I talk to my patients a lot about, particularly when we have really bad air quality days.

So, I think, yes, there are a lot of things from a lifestyle modification perspective, and doing preventive things that are not necessarily pharmacologic can help patients really manage their overall disease.

Dr. Ramnarine:

And when a patient does exacerbate, what does good acute management look like today? Are we still leaning heavily on systemic corticosteroids or antibiotics, or has the approach changed?

Dr. Han:

I think the general approach has mostly stayed the same. So short-acting bronchodilators remain fundamental. I think, for many patients, we are still using systemic corticosteroids, but now—as opposed to, for instance, when I first started practice, where we were giving weeks of therapy—the data suggests that shorter courses are probably just as effective.

I think antibiotics are helpful, particularly when we see increased sputum purulence, increased sputum volume, along with the shortness of breath. And then, obviously, if a patient lands in the hospital, other forms of ventilatory support can be helpful along with things like oxygen, as well.

So I think, overall, the treatment approach is probably similar to what it was, but I think maybe the one shift I've noticed is that we're now recommending shorter courses of steroids.

Dr. Ramnarine:

Before we wrap up, Dr. Han, what key takeaways would you like clinicians to remember about our conversation today?

Dr. Han:

I think, number one, exacerbations really matter, and not just during that acute event itself. I think, as clinicians, we treat something, and mentally, we move on. But for the patient, this event could have significant long-lasting impact, and the onus is really on us not just to treat the event, but to think about how we can prevent the next one.

I think another thing is just to remember that COPD is very heterogeneous, and that we can use exacerbation history symptoms and eosinophils to help guide precision therapy. And, as you kind of indicated, yes, we do want to use the medications that are available to us, but things like smoking cessation, vaccination, pulmonary rehab, and making sure patients are doing the basics right, like using their inhalers correctly, are still really important parts of providing good COPD care.

Dr. Ramnarine:

With those final thoughts in mind, I want to thank my guest, Dr. MeiLan Han, for sharing her insights on reducing COPD exacerbations and improving care. Dr. Han, it was great having you on the program.

Dr. Han:

Thanks so much. It was great to be here.

Announcer:

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