**Medical Insider COPD Podcast Season 4  
Comorbidities in COPD: Cardiovascular crossover**

Richard Russell (00:05):

This podcast is intended for healthcare professionals outside the United Kingdom and the United States of America only. Welcome to the Medical Insider COPD by Boehringer Ingelheim, a podcast offering a breath of fresh air to clinicians treating COPD across the globe. My name is Dr Richard Russell. I'm a Consultant Chest Physician at Lymington New Forest Hospital, a Senior Clinical Researcher at the University of Oxford, as well as the Editor-in-Chief of the *International Journal of COPD*. As your moderating host for this season of Medical Insider COPD podcast, I'm here to bring you news and insights in COPD right from the source to you. So, thank you for joining us today. Be sure to subscribe and follow Medical Insider COPD to ensure that you do not miss any of the exciting podcasts in this series.

Richard Russell (01:01):

Today, we're going to delve into a publication which we believe is well worth reading. This is entitled, "Severe pulmonary hypertension associated with COPD: long-term results of a prospective French multicentre cohort." I'm also going to delve in with you to the subject on social media, which is all about mucus in the lungs. But first, I'm delighted to introduce today's guest, who's going to be with me here to discuss the topic of cardiovascular disease and COPD. So, welcome, Professor David Newby, British Heart Foundation, Chair of Cardiology at the University of Edinburgh.

David Newby (01:36):

Hi there, Richard.

Richard Russell (01:38):

Great that you can join us today, David, to give us a different perspective, I think, on cardiovascular and respiratory disease and how we can do things better for the future. This is clearly a hugely important topic, and it's really becoming more and more important as we understand comorbidities with our COPD patients. But David, can you help us understand the relationship between the two?

David Newby (01:59):

Yeah, so there's a lot of commonality between chronic obstructive pulmonary disease and cardiovascular disease. And the most obvious thing is that smoking is a critical component of the incidence of both conditions. Of course, the majority of people with COPD have had, or are currently smoking and the same is true in cardiovascular disease, certainly atherosclerotic cardiovascular disease, heart attacks, and strokes. And of course, there's also the commonality of other risk factors and the metabolic syndrome, sedentary lifestyle, hypertension, and other such factors. So yeah, they're intimately interrelated.

Richard Russell (02:35):

And do you think there are actually joint pathophysiological mechanisms of how COPD and cardiovascular disease cross over?

David Newby (02:41):

Yes, I think so. And interestingly, I think that they affect very similar pathways. One example, emphysema, get a lot of elastin breakdown and change to collagen. When that happens in the aorta, as it does in cigarette smokers, you get stiffer arteries and the elastin changes to collagen. So, that's the sort of the link that you can get, for example, with hypertension and stiff arteries causing strokes and heart attacks are intimately related to the same physiological processes.

Richard Russell (03:11):

When we talk about cardiovascular comorbidity, we often focus, and certainly the public often very much focus on ischemic heart disease and the heart attack, but there's much more to it that, isn't there?

David Newby (03:22):

Absolutely. So, there are other conditions. Obviously smoking and heart attacks are intimately related, particularly in the young, very strong associations, but it does go beyond that. There's the risk of stroke, and there's a risk of heart failure, of course. And there, we're getting into territories where it's very difficult sometimes to disentangle between the two.

Richard Russell (03:40):

You mentioned disentangling. Well, this is really tough sometimes, isn't it? Because people with both primary cardiovascular and primary respiratory disease present with breathlessness, and of course the two types of disease can coexist. So, how do we pull them apart?

David Newby (03:53):

Yeah, very difficult, very difficult. So, of course, chest pains and chest tightness can often go hand in glove. And I've certainly had patients return to me from the respiratory clinic, and I'm sure the reverse has happened to you Richard too. So, we have to be vigilant for that. And then we come to breathlessness, of course, and people who have all the risk factors associated with COPD have all the same risk factors associated with heart failure. And so, we have to be super vigilant to try and do that. And I think we sometimes need to think out of the comfort zone of our own specialty and delve into some investigations in our allied specialties.

Richard Russell (04:28):

Would you recommend, from a cardiovascular point of view, some simple tests that we in respiratory medicine should do to screen?

David Newby (04:37):

Well, certainly the cardiologists are keen for that. European Society of Cardiology do recommend screening for atherosclerotic cardiovascular disease in patients with COPDbecause of course, patients with COPD are eight to 10 times more likely to die from cardiovascular disease than matched comparative control populations. They're more likely to have left ventricular systolic dysfunction. So, we do need to think about that, the simple, humble ECG. Okay, doesn't quite happen so often in the respiratory clinic, much like pulmonary function test doesn't happen so much in my clinic, but some tests we do together, cardiac CT angiography. Doing a CT chest. And when I do a CT coronary angiogram, I always look for emphysema on the scans, on the long windows. And of course, for CT emphysema, you can always see coronary calcification, a real tipoff. So, I think doing the simple test, but also using the tests we're already doing in a smarter way is really, really important.

Richard Russell (05:27):

Let's now talk about the use of cardiovascular drugs in COPD to manage these cardiovascular comorbidities. Are there specific guidelines that can help us? And where should we start?

David Newby (05:38):

Well, certainly I think in terms of treatment of coronary disease, then when it's identified, would obviously recommend aspirins and statins to try and prevent future cardiovascular problems. I think once we're getting into heart failure, that can get a bit more complex. And in fact, our cardiologists have our own specialty of heart failure cardiologists, it is complex. We've got the standard treatments of ACE inhibitors, beta blockers, and now the more modern ones, empagliflozin, for example, when to use them, how to use them. And they're increasingly being promoted. And I think really useful drugs making big impacts. So, we need to actually help each other.

Richard Russell (06:15):

Certainly, we in respiratory medicine are sometimes a little nervous about prescribing some of these cardiovascular drugs. And you mentioned beta blockers. Do we need to be concerned?

David Newby (06:24):

As you know, there is some conflicting advice out there. I think if we stick with the cardiovascular trials for post MI prevention of recurrent events and heart failure, in terms of mortality, beta blockers are incredibly effective, one of the best drugs we have. And that is also true in patients with COPD. So, when you look at observational data, people who have COPD and heart failure or an MI, they do better on a beta blocker than those that don't take beta blockers. Of course, there was a recent randomised control trial looking at COPD with beta blockers, but I think you need to remember there that was to treat the COPD, and the patients in that trial had to not have any evidence of cardiovascular disease. So, patients with MI, patients with heart failure were excluded. And of course, as you know, that trial did show problems, in that when you came in with an exacerbation, it was much more severe if you were already on a beta blocker. But as I say, those patients had the potential harm from the beta blocker without the benefit, the benefit being for cardiovascular disease. So, I think it's a different population, and I think we should still use beta blockers in patients with COPD, if they have cardiovascular disease.

Richard Russell (07:35):

I think that's very clear and very helpful, and something which we should encourage our colleagues to be mindful of. It's also about understanding the data and having an approach together on this. So, do we need to help our cardiology colleagues with use of inhalers, and particularly maybe looking at optimising bronchodilatation?

David Newby (07:54):

I think so. And I think much like the heart failure analogy when you're escalating therapies, say to Empagliflozin, what we want to do for respiratory treatments in cardio is encourage them to use the simple therapies that we know, are familiar with and have the confidence to use. But when they don't work and they need further escalation, that's when to bring in respiratory colleagues to help guide us as how to treat these patients better.

Richard Russell (08:18):

Certainly, optimisation is really important and it has other benefits, I think as well, David, exercise being one of them. Is it important in both cardiovascular disease and respiratory disease?

David Newby (08:29):

Absolutely and this is a common anxiety of patients, particularly in my clinic. Should I be out exercising if I've got a heart condition? Should I be wrapping myself in cotton wool? And I say to them, "Absolutely not. Get out there. You need cardiovascular fitness." And all the evidence says that if you have heart failure, if you have coronary heart disease, the more exercise you do, the better you do. And so cardiovascular exercise for 30 minutes two or three times a week is very helpful. And it's important to try and break that cycle of sedentary lifestyle that are common to COPD and cardiovascular disease patients.

Richard Russell (09:00):

Another benefit of dual bronchodilators which has been shown has been a reduction in intrathoracic volume, intrathoracic pressure, which certainly has, in studies, shown some benefits on left ventricular end-diastolic pressure, and therefore increasing cardiac output. That may be helpful in heart failure, I guess.

David Newby (09:20):

No, absolutely. I think anything that we can do to relieve the after-load pressure and reduce preload will be very beneficial in patients with heart failure. And I think from a simple theoretical viewpoint, the less strain you put on the heart, the better it'll be, and obviously having good respiratory function will help and assist the heart.

Richard Russell (09:38):

So, optimising bronchodilators is a good strategy, but let's come on to talk about safety and the safety of COPD treatments in patients with cardiovascular comorbidity. Let's, again, concentrate, first of all, on the bronchodilators, LAMA/LABA dual bronchodilator therapy. Is there any data that can help us there?

David Newby (09:55):

Yeah, so of course, historically, in the 1970s and sixties, there was a bit of a concern around the bronchodilators isoprenaline and some of the associated potential for cardiac harm. Now, of course, these drugs were delivered in a perhaps less effective way than they are today. The doses used selectivity. All of these things were very different. And so, as you'd expect, the regulators have been very focused on making sure any new therapies have safety profiles. That's true in the diabetic world, and also in the respiratory world. So, there've been several trials that have looked at cardiovascular risk in terms of inhaler therapies. I was involved with one of them, which actually enriched the population for patients with COPD and cardiovascular disease. So, if you're going to see it, you should see it there. And generally speaking, these drugs were very well tolerated. We didn't see a particular excess of cardiovascular events. And in fact, if anything, it was trending in the opposite direction. Wasn't significant, but if anything, it was doing well. So, we can have reasonable confidence, as much as you can, that these drugs do appear to be safe in the context of being used in patients with cardiovascular disease. So, I think that really is not a major concern at this time.

Richard Russell (11:08):

That's very helpful and very clear. The other class of drugs we often use are those that contain inhaled corticosteroids. Are there any signals there that we need to be concerned about or reassured by?

David Newby (11:18):

Well, again, steroids and cardiovascular disease don't tend to mix too well, certainly post-MI. Systemic corticosteroids are associated with worse outcomes, impairs the healing of the heart, and myocardial rupture and was seen to be slightly higher. And in heart failure, of course, anything that cause salt and water retention is not going to be a great thing for patients who are struggling with circulatory expansion and heart failure and peripheral edema. But that's very different to inhaled corticosteroids, where yes, you can obviously detect systemic levels of corticosteroids, but an order of magnitude or more, lower than you'd expect with systemic steroids. And again, with those cardiovascular risk populations, we didn't see any major signal with them. And again, if anything, it was trending the opposite way. So, in general, I think we can be reassured by those data, and that they appear to be well tolerated and without any adverse consequences.

Richard Russell (12:06):

That's very helpful and clear. So, I now put you on the spot, the kind of hard moment. I'm going to ask you to summarise the key takeaways from this discussion that you would want my respiratory colleagues listening to this to take away and enact in their practice.

David Newby (12:21):

I would like them to think, first of all, when they see their patients, think about cardiovascular risk, think, is this an opportunity to help the patient also for their heart? I'd ask them to think about simple investigations, like an ECG, if there's any concern or worry about that. And then finally when you do do a test like a CT scan, use it to its full advantage. Think about cardiovascular risk, because this patient, you obviously are going to make them feel better symptomatically, but they can still drop down dead with a heart attack, eight to 10 times more likely. So, that's also help them with that and think about simple prescription of an aspirin and a statin.

Richard Russell (12:58):

Okay, I'm going to flip it. What should I be doing to help my cardiology colleagues with their management of COPD?

David Newby (13:04):

I think sometimes, we should be working more together. I think there's breathless patients can sometimes be a bit of tennis between the different specialties. And I think what we need to do is actually think about working together to do that. And we, as cardiologists, need to be smarter at doing pulmonary function tests, think about prescriptions and of inhalers and the corollary as we've already discussed with the respiratory physicians. But also, therapies are getting more and more advanced and complex, and we should be helping each other more to get the patient feeling better.

Richard Russell (13:38):

Well, thank you very much Professor David Newby from the University of Edinburgh, thank you for joining the Medical Insider COPD podcast. It's been a great pleasure.

David Newby (13:45):

It certainly has. Nice to talk to you, Richard.

Richard Russell (13:54):

Before we talk about an important and new social media topic for COPD patients, let's unpack a new paper in COPD. This is keeping on with the cardiovascular theme that we've got going today. It's entitled, "Severe pulmonary hypertension associated with COPD long-term results of a prospective French multicentre cohort study." This is published in the ERJ 2022 volume 60 and it's page 2102897. So, pulmonary hypertension is a problem in COPD. It's prognostic. It affects significantly our patients’ quality of lives. Severe pulmonary hypertension is defined as a right ventricular pressure of greater than 35 millimeters of mercury. In the context of a low cardiac index, it's defined even with a pressure of 25 millimeters of mercury. So, in 2012, the group in France designed a prospective cohort study with the aim of more completely describing this entity. They took 99 patients, age 66, 83% were males, and they all had to have a pulmonary artery hypertension pressure greater than 35 millimeters of mercury. They very carefully excluded pulmonary fibrosis. So, what did they find? Well, these patients were very breathless. 78% had a New York Heart Association Classification of grade three or four. The FEV1 was around 50% predicted, so not too bad, but they had this comorbidity. They had low transfer factors of 36%, and their pulmonary artery pressure on average was 42. 64 of these patients received treatment for pulmonary artery hypertension. But in all of them, the median survival was only 31 months.

Richard Russell (15:34):

So, what predicted mortality? Well, this was associated with age, degree of breathlessness, transfer factor, and degree of smoking, but not therapy. So, the only long-term survivors in the study actually received a lung transplantation. So, what can we take away from this study? Well, we definitely should be looking for pulmonary artery hypertension. We should diagnose it, because it's important from a prognostic point of view. And we should bear in mind those patients who may be eligible for lung transplantation, especially so we can refer them in a timely manner. This is something I've learned from this paper.

Richard Russell (16:17):

And now for the final part of today's podcast, we come to the social media bit. What's new and trending in the world of social media, on the internet for people with COPD. Well, there's lots of focus at the moment on mucus in the lungs, what to do about it, how to manage it. The COPD Foundation is pushing a program of exercise and training at the moment to get people to understand the impact of mucus on them, hashtag airways clearance. This is full of tips and practical advice. It's valuable for those with COPD, but also bronchiectasis. People can learn how to do an active cycle of breathing, how to do autogenic drainage, forced respiratory techniques, and indeed use PEP, or PEP therapy, to help them clear their lungs. This current campaign by the COPD Foundation and on their website is really important, especially now in the summer and in the warmer weather, but it's important all year round. We need to keep well, get our patients hydrated, and keep them, as much as possible, active. Activity helps them clear their lungs.

Richard Russell (17:21):

Thank you for joining me today on the Medical Insider COPD podcast. I hope you've enjoyed it. It's been great to look at COPD and cardiovascular disease as a crossover with a different pair of eyes. And I hope this has given you a new perspective on to manage these conditions together. So, please subscribe to the Medical Insider COPD podcast series and don't miss any of the exciting podcasts that we are bringing to you.