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Partnering for Progress: A Case Study in Patient-Centered Hyperkalemia Management

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Introduction

Dr. Wheeler:
Hello, everybody. I’m David Wheeler, and I’m a Professor of Kidney Medicine at University College London. I’d like to welcome you to our Patient-Clinician Connection focused on hyperkalemia management.

Today we’re going to discuss the common challenge we face in the management of patients with chronic kidney disease and heart failure, and that is the balance between optimizing RAASi therapy and the management of hyperkalemia.

These medicines that inhibit the renin-angiotensin-aldosterone system are essential for improving outcomes in our patients, but they also lead to an elevated potassium level. To effectively address this issue, it’s important to understand the patient perspective and to work collaboratively with the patient to develop a personalized treatment plan.

Today, I’m going to illustrate my approach to communicating treatment options and potential risks and benefits to RAASi therapy through clinical vignettes. So, let’s get started.

Case Presentation

Dr. Wheeler:
So, today, my patient is James, and he’s attending a virtual follow-up appointment with me. He’s had a recent rise in his potassium level and has attended one of the local emergency rooms.

James is 72 years old; he’s got a history of diabetes, hypertension, and stage 3 chronic kidney disease. He’s had type 2 diabetes for 15 years, hypertension for 20 years, and stage 3 chronic kidney disease for 5 years. He does not have a history of heart failure, and he has not had an episode of acute kidney injury. His current therapy comprises lisinopril in a dose of 20 mg once a day, metformin in a dose of 1,000 mg twice a day, and hydrochlorothiazide in a dose of 25 mg once a day. He’s allergic to penicillin.

He’s been on his lisinopril, metformin, and hydrochlorothiazide for several years, but his recent blood pressure has been high at around about 160/90 mmHg. He hasn’t had ankle swelling. His eGFR most recently was 35 mL/min, and his urinary albumin-creatinine ratio around 800 mg/g. Looking at his recent results, I also noticed that his potassium level has been high, and this was the reason he

ended up attending one of the local emergency rooms.

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Patient Vignette 1

Dr. Wheeler:
So, James, I understand that you've been seen at one of the local hospitals recently because you've had a high potassium level and one of your medicines has been stopped. Could you tell me more about how you're feeling now, please?

James:
Well, Doctor, since they stopped my blood pressure medication, I've had headaches. I've been feeling weak. My wife mentioned she read that high potassium can be dangerous.

Dr. Wheeler:
Yeah. Thank you for communicating your concerns there. And it is important that we talk this through and come up with a management plan for your condition.

James:
It's been gradual. I haven't had any heart problems or anything like that.

Dr. Wheeler:
Yeah, that's good to hear. How have you been feeling about taking your other medicines?

Audience Education Vignette 1

Dr. Wheeler:
So what's happened here is that James, our patient, has been on lisinopril, an ACE inhibitor, but also has chronic kidney disease. And in the context of chronic kidney disease, ACE inhibitors, such as lisinopril, can lead to high potassium levels. So, James has had a blood test done, the potassium level was high, and somebody looked at that blood test, has told James that there's a problem, and then sent him to the local emergency room. The healthcare professionals in the emergency room have spotted this problem, lisinopril, chronic kidney disease, and have decided to discontinue the lisinopril in order to allow the potassium to fall again.

So what's happened here is that we've actually stopped a crucial drug because of a problem with potassium. Now, one thing that worries me a little bit is that James is now reporting headaches, and that could be a sign that his blood pressure has gone up as a result of stopping lisinopril. So, we certainly need to get him onto blood pressure-lowering medicines again, and I would really like to continue lisinopril. There's no evidence to suggest that stopping lisinopril in patients such as James improves kidney function or improves outcomes. In fact, quite the opposite. We believe that we should continue these medicines in order that we protect residual kidney function and protect against heart problems.

So what we've got to do with James now is to talk him through restarting his lisinopril, but in some way protecting him from hyperkalemia/high potassium levels by introducing a medicine that's going to keep his potassium at a safe level. So, let's return to our discussion with James and discuss the next steps.

Patient Vignette 2:

Dr. Wheeler:
So, James, the medical conditions you've got, particularly the diabetes and the kidney disease, put you at higher risk of this problem called hyperkalemia. Now, that means a high level of potassium in your blood. Potassium is a mineral that your body needs, but we need the right amount. And when the levels in your blood rise too high, this can cause disturbances to your heartbeat and can cause your heart to beat abnormally, and that can potentially be dangerous. So we do want to make sure that the potassium doesn't go up, but we also want to get you back onto the lisinopril drug that will reduce your blood pressure and protect your heart and your kidneys.

James:
So what can we do about it? My lisinopril was stopped when I attended the hospital.

Dr. Wheeler:
And what I'm going to propose is that we restart the lisinopril, but we do it in a safe way by adding in another medicine that's going to control your potassium levels. And we can go back to that in a while, but what we need to do is restart your lisinopril to control your blood pressure and to reduce your risk of the kidneys failing and the heart failing. We're going to protect you from progressive kidney and heart damage by putting you back on the lisinopril.

So the medicine we're going to add in when we put you back on the lisinopril is called a potassium binder, and this is a medicine that helps remove potassium from the body so that the high potassium should no longer be a problem.

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James:
Will I have to stop taking my blood pressure medicine?

Dr. Wheeler:
Well, your lisinopril is one of your blood pressure medicines, and we're going to be putting you back onto that, and we're not going to be changing any of your other medicines.

Audience Education Vignette 2

Dr. Wheeler:
So what we've identified here in our patient is a number of risk factors for high potassium. We've got diabetes, we've got chronic kidney disease, and we've got a patient on an ACE inhibitor. And that combination of risk factors has led to the development of hyperkalemia.

One of the options we've got now is the use of long-term potassium binders, and what these binders do is they absorb potassium in the gastrointestinal tract. They enhance the excretion of potassium from the gastrointestinal tract, and they control blood potassium levels. By using these potassium binders, we can keep patients on RAASi therapies such as ACE inhibitors and angiotensin receptor blockers.

But when we're thinking about putting patients onto these treatments, we really have to explain what we're trying to do here. It's very important that while the patient is on the RAASi therapy, they also continue to take the potassium binder. So we need to explain to James why we're putting him on the potassium binder and putting him back on the lisinopril therapy.

So let's watch this discussion with James.

Patient Vignette 3:

Dr. Wheeler:
So, James, based on the discussion we've had so far, I think there's a way that we can solve this problem, but I would like to involve you in the decision-making process.

James:
That would be great.

Dr. Wheeler:
So what I'm going to propose is that we offer you a medicine called a potassium binder. Now, this is a medicine that you take by mouth. It goes through the gut, and it comes out the other end, and when it comes out the other end, it takes out a lot of potassium with it. So it stops you from absorbing potassium from your diet. And if we did this and got your potassium under control, we could restart the lisinopril medicine, which will lower your blood pressure and protect your kidneys and your heart.

James:
I'm worried about restarting my blood pressure medicine. I don't want my potassium to get worse again.

Dr. Wheeler:
No, of course. And I don't want it to get worse either, and I certainly don't want you to end up in the emergency room, so I completely understand that concern. We do know from a number of clinical studies now that if we use these potassium binders long-term, we can put patients back onto the lisinopril, and medicines like lisinopril.

So it's like two drugs working together. The potassium binder is counteracting the effects of the lisinopril on the potassium. So as long as we're taking the two at the same time, then we should be safe. So what I want you to do is see these two medicines as like a pair. If you are taking lisinopril, you also need to be taking the potassium binder, and as long as you are, we should not see high potassium levels again.

So we don't want you to stop the binder and continue the lisinopril; these two medicines go together. We are, of course, going to keep an eye on your potassium, and we're going to be checking the potassium levels again in a month's time.

Audience Education Vignette 3

Dr. Wheeler:
So I hope you can see that what I've done here is explain to James that we are adding in a new medicine to facilitate in continuing an existing medicine. We are adding in a potassium binder so that he can carry on with the lisinopril, and I've tried to stress to him how important that lisinopril is and why that is the best medicine for him to be on. I've also tried to explain that whilst he is on the lisinopril, he needs to take the potassium binder. If he stops the potassium binder, the lisinopril may cause problems with high potassium levels again. So I've tried to link these two medicines together so that James can see that it's important that he takes both at the same time.

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Now, we know that patients don't always take all their medicines. The scenario that worries me here is that if he stops taking the potassium binder and continues the lisinopril, we may see high potassium levels again, and, as we've already said, that could potentially be harmful. So I've tried to explain that these two medicines go together, and if you're taking one, you should be taking the other.

I believe that involving patients in these discussions and explaining to them what these medicines do and why they need to be taken together will improve patient compliance with therapy, and the patients will take the tablets. So I emphasize that the lisinopril is important to protect kidney and heart function, but that while taking the lisinopril, we also have to take the potassium binder.

So James is returning for his follow-up visit after 1 month. It was 1 month ago that he started his potassium binder and restarted his lisinopril therapy. His new potassium level is now 4.8 mmol/L.

Patient Vignette 4

Dr. Wheeler:
So, James, I'm glad to see you again. Your potassium has improved. It's now within the normal range, so it's no longer high. I wanted to know how you were feeling and whether you'd had any side effects from your potassium binder.

James:
I've been feeling better, and I haven't had any problems with the medication.

Dr. Wheeler:
So that's obviously good news. I'm pleased that you're back on your lisinopril. Your blood pressure has come down; it's under control. And because you're taking the potassium binder, we now have your potassium under control as well. We're going to continue to check your potassium, and I'm going to check it again in 3 months' time. And we're also going to monitor your kidney function and your blood pressure. One thing I should just say is that we want to maintain you, of course, on a healthy diet, and we want you to stay well-hydrated for the sake of your kidneys.

James:
Okay, Doctor. Thank you.

Dr. Wheeler:
Thank you very much, James.

Audience Education Vignette 4

Dr. Wheeler:
So it's obviously important now that we continue to follow James, and we continue to check potassium, and kidney function, and blood pressure. We need to make sure that he's continuing to take the potassium binder. We need to continually remind him of the importance of taking the potassium binder in combination with lisinopril. And having engaged him in this conversation and educated him about this, I'm sure that he will remain compliant with his therapy.

Closing

Dr. Wheeler:
So when we're managing patients with diabetes and chronic kidney disease on RAAS inhibitor therapy, we have this delicate balance between the benefits of the therapies; those benefits include slowing progression of kidney disease and improving cardiovascular outcomes, but we have to balance that against the side effects and complications of these drugs. And, of course, in a patient with kidney disease, one of the main problems that we face, as we've seen today, is a high potassium level.

The potassium binders have given us a solution to this problem. So by adding in a potassium binder, we can keep the patient on the RAAS inhibitor therapy, but as I've explained, and as we've discussed with James today, it's important that whilst he's taking the lisinopril medicine, he remains on that potassium binder. But on that combination, we should be able to safely control potassium levels, and he has the benefits of taking the lisinopril treatment.

So I hope that that was helpful, and I hope we've explained the risk/benefit scenario that we have here. And I hope that's been helpful to those of you who practice.

So thank you for joining me for our case study in patient-centered hyperkalemia management. Thank you to James for joining us today, and goodbye.

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