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ReachMD

www.reachmd.com
info@reachmd.com
(866) 423-7849

What are the "Faces" of Resistant Hypertension?

Announcer:
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Dr. Voora:
Good morning, everybody. Before I begin, I just want to thank the organizers of today's session for giving me the opportunity to speak today. So, I'm going to start by sharing two clinical cases to get us warmed up and thinking about resistant hypertension.

So, in this first case, we have a 58-year-old man with a past medical history of diabetes and hypertension who's being referred for evaluation of uncontrolled hypertension. He has no known target organ damage related to his hypertension. And as you can see, he is currently on three antihypertensive agents, hydrochlorothiazide, 25 milligrams once a day, losartan, 100 milligrams once a day, and amlodipine, 10 milligrams once a day. Despite being on these three antihypertensive agents, his blood pressure in the office remains elevated as you can see here on this slide.

The second case is a 51-year-old female with a past medical history or preeclampsia who also presents for evaluation of uncontrolled hypertension. She actually presented to her provider three years ago with the new onset of headaches and was found to have a very elevated blood pressure and she was started on antihypertensive medications at that time. She's currently also on three antihypertensive agents, including chlorthalidone, 25 milligrams once a day, losartan, 100 milligrams once a day, and a long-acting calcium channel blocker, nifedipine, 90 milligrams once a day. And despite being on three antihypertensive agents her office measurements remain elevated. So, my question to you all is do these patients have resistant hypertension?

So, I'm going to take a moment to review the definition for both resistant and refractory hypertension. So uncontrolled resistant hypertension describes those patients whose blood pressures are not controlled despite adherence to at least three antihypertensive agents of different classes, including a diuretic, a long-acting calcium channel blocker, and a RAAS blocker. Now if a fourth medicine is added to these patients and the four medicines control the blood pressure, then the patient is described as having controlled resistant hypertension. However, if four medicines do not control the blood pressure and a fifth medicine is added, then the patient is labeled as having refractory hypertension. More specifically refractory hypertension describes those patients whose blood pressures are not controlled despite adherence to at least five antihypertensive agents of different classes, including a long-acting thiazide-like diuretic and a mineralocorticoid receptor antagonist. And as you can see the definition for refractory hypertension includes treatment with a thiazide-like diuretic and a mineralocorticoid receptor antagonist based on published studies that have demonstrated the superiority of chlorthalidone over hydrochlorothiazide and based on studies that have confirmed the preferential benefit of spironolactone in the treatment of resistant hypertension.

So, going back to our patients in case one and case two, do they have resistant hypertension? After all they're both taking three antihypertensive agents of different classes including a diuretic, and yet their office measurements remain elevated. Do they have resistant hypertension? And the answer is, maybe. So, these patients may not have true resistant hypertension.

They could have pseudo-resistant hypertension. Pseudo-resistant hypertension refers to poorly controlled hypertension that seems resistant to treatment, but the actual, but the elevated blood pressure is actually treatable to some other factor such as non-adherence to prescribed medications, non-adherence to lifestyle recommendations, white coat effect, which describes those patients with hypertension who have elevated blood pressure readings in the office. But when their readings are checked outside of the office, they're actually repeatedly normal. Also, pseudo-resistance could be to a non-optimized medication regimen. For example, patients getting suboptimal or inappropriate dosing of medications. Also, could be due to inaccurate blood pressure measurement. And lastly could be due to poor sleep quality. And so very important that before you label a patient as having true resistant-hypertension you really need to evaluate for the presence or absence of each of these factors. And I'm going to spend a few minutes talking about some of these factors in the next few slides. The last one, poor sleep quality will be discussed by the next speaker, Dr. George Bakris. And as you're going to hear from him interrupted sleep at night is a significant factor for uncontrolled hypertension.

So, this slide underscores the importance of assessing for medication nonadherence, white coat effect, and non-optimized medication regimen, and an accurate blood pressure measurement in patients who appear to have resistant hypertension. This slide is showing you the estimated prevalence of each of these factors in different studies that involve different cohorts of patients who appear to have resistant hypertension. And as you can see the prevalent estimates are quite high. So for example in a study that evaluated, the prevalence of medication non-adherence among patients who appear to have resistant hypertension, the estimated prevalence was as high as 40%. In another study that looked at white coat effect, the estimated prevalence was 35%. Non-optimized medication regimen, really high 65%. And lastly, inaccurate blood pressure measurement, the estimated prevalence was as high as 33% among patients who appear to have resistant hypertension. And so clearly again, you must assess for the presence or absence of these factors before labeling a patient's having resistant hypertension. Cause clearly these factors can account for the misdiagnosis of resistant hypertension. So, when I think about the patients in case one and case two it's perhaps best to label them as having apparent resistant hypertension.

It's only after you exclude pseudo-resistance, and you label them as having true resistant hypertension. So how do we exclude pseudo-resistance? Well, this is really the pathway that I would suggest to you. So, if you have been a patient who appears to have resistant hypertension, you must do out-of-office blood pressure monitoring in those patients. And that is to exclude white coat effect. There are two modalities available for out-of-office blood pressure monitoring. There's 24-hour ambulatory blood pressure monitoring, and there's home or self-measured blood pressure monitoring. Really 24-hour ambulatory blood pressure monitoring is a gold standard way for assessing for white coat effect. However, realizing that it's not widely available, home or self-measure blood pressure monitoring is a very good option. In addition, you must assess for nonadherence and specifically to medications. Now, this is a very complicated topic, non-adherence to medications. It could be a talk in and of itself for the next hour. And what I'll briefly say is that you all have to evaluate in your own practice how to evaluate for non-adherence. And it really will depend on the makeup of your practice and who are the members of your hypertension team. And it could include doing something as asking your patients in a non-judgmental way how many times a week do they miss medications? Or it could be something as sophisticated as doing urine testing for antihypertensive medications and their metabolites. No matter what you decide to do you have to do something cause it's a real problem. And then I must underscore the importance of ensuring that all blood pressure measurements obtained both in the office and out of the office must be obtained accurately.

And one tool that can help to potentially maximize the accuracy and reproducibility of office blood pressure measurements is the use of automated office blood pressure monitoring. These monitors are fully automated monitors that can be programmed to take several readings in succession. So, for example in our hypertension clinic, we program these monitors to take three readings in a row one minute apart. In addition, our staff members can leave the room while these measurements are being obtained. And this is called unattended automated office blood pressure monitoring. And this has the potential to minimize the white coat effect.

So, I want to leave you with a few key messages. You really must exclude pseudo-resistance before diagnosing resistant hypertension. And that means you are ensuring accurate blood pressure measurements both in the office and outside the office, must assess for non-adherence with prescribed medication regimen and lifestyle recommendations. And you must obtain out-of-office blood pressure measurements to exclude a white coat effect.

Announcer:
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