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Translating Blood Pressure Lowering to Reductions in End Organ Damage

Announcer:

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Dr. Nanna:

Hello, my name is Michael Nanna and I'm an assistant professor in the section of cardiovascular medicine at Yale School of Medicine. This presentation is on Translating Blood Pressure Lowering to Reductions in End Organ Damage. These are my disclosures. The burden of hypertension has, unfortunately, continued to rise since the 1990s, as you can see on the figure to the left. The number of adults aged 30 to 79 with hypertension doubled from 1990 to 2019, from more than 300 million women and men in 1990 to more than 600 million women and 600 million men in 2019. There was marked variability by geography that you can see in the figures to the right. In 2019, age-standardized hypertension prevalence was lowest in Canada and Peru for both women and men, for example, whereas prevalence surpassed a whopping 50% for women in two countries and men in nine countries in Central and Eastern Europe, Central Asia, and Latin America.

And with that burden of hypertension across the globe, there are significant ramifications in terms of end-organ damage from hypertension. Working our way clockwise on this figure, the classic manifestations of hypertensive end-organ damage includes several major causes of morbidity and mortality worldwide. That includes coronary heart disease and myocardial infarction, left ventricular hypertrophy, congestive heart failure, atrial fibrillation, and abdominal aortic aneurysms. We also think about renal repercussions of uncontrolled hypertension, including nephropathy, albuminuria, proteinuria, all of which leading to chronic renal insufficiency. Also, peripheral arterial disease, including atherosclerotic changes leading to the development of either stenosis and/or aneurysm, hypertensive manifestations in the eyes, such as retinopathy. And then, of course, the dreaded cerebral complications, including ischemic and hemorrhagic stroke and associated vascular dementias. So we see that the end-organ damage from uncontrolled hypertension manifests across multiple organ systems and can have really devastating results.

Despite this sobering challenge, we know that the best way to prevent end-organ damage from uncontrolled hypertension is to control it. And, fortunately, for clinicians, there is a path toward risk reduction for many of these serious complications. We see here that with every reduction of 10 millimeters of mercury in systolic blood pressure, there are profound relative benefits on end-organ complications, including a 28% relative risk reduction in heart failure, a 20% risk reduction in major adverse cardiovascular events, a 17% reduction in coronary heart disease, and 19% risk reduction in retinopathy and perhaps most impressively, a 27% risk reduction in stroke incidents. So this is really a profound opportunity for benefit for our patients with hypertension with relatively modest reductions in blood pressure.

Does it matter where we start in terms of baseline blood pressure? Well, actually, the data suggests that the benefits of blood pressure lowering are remarkably consistent across end points like stroke, heart failure, and coronary heart disease for every 10 millimeter mercury reduction in blood pressure across different starting points of baseline blood pressure. So, for example, you're going to see the benefits of blood pressure lowering whether your patient's starting blood pressure is 130 or 160.

So what are our take home points of this talk and the clinical relevance? I'll reiterate that end-organ damage from uncontrolled

hypertension represents a major health burden across the globe. And the evidence is clear on the association between blood pressure lowering and risk reduction across a number of important outcomes and organ systems across different baseline blood pressures. The onus is on all of us as clinicians to aggressively target blood pressure lowering to reduce the risk of serious morbidity and mortality in our hypertensive patients. Thank you for your attention.

Announcer:

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