

THE EPIDEMIOLOGY OF HYPERTENSION AND RELATED CONDITIONS IN THE AFRICAN-AMERICAN POPULATION

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Thank you, Dr Taylor, Dr Lenfant, panel members, distinguished guests, ladies and gentlemen, and friends and colleagues at Howard University. It is my distinct pleasure to be here to share a few comments about the epidemiology of hypertension and its related conditions in the African-American population.

I want to thank Dr Roccella for providing some of the prepublication information that I requested to prepare this talk. Frequently we turn on the news and we hear what the government does not do well, but I can tell you that what the government I interface with does better than anyone else is facilitate data collection. So my thanks to Dr Roccella, who is an outstanding public servant.

Let us look at the prevalence of hypertension nationally. Hypertension is defined as a person having systolic pressure consistently over 140 mm Hg or diastolic pressure over 90 mm Hg, or being on medication for hypertension. In the overall noninstitutionalized population, about 24% of adults, or 43 million people, have high blood pressure. Overall, hypertension is a little more prevalent in women than men in the adult noninstitutionalized population.

In non-Hispanic blacks, or African Americans, the age-adjusted percentage is about 32%, which is almost 6 million people with high blood pressure nationally in this 18- to 74-year-old age group. More women than men are affected. In addition, a large number of non-Hispanic whites—about 35 million people—have high blood pressure. A larger percentage of African Americans than whites, however, are affected. But

clearly, hypertension is a public health problem that affects our entire population.

Some useful blood pressure categories were published recently in the *Fifth Joint National Committee Report on Detection, Evaluation, and Treatment of High Blood Pressure*. There are several things I like about this classification. One is that it takes us out of the mind set that there is a blood pressure level below which there is no blood pressure-related cardiovascular risk, but that immediately above this blood pressure level a person is suddenly at risk for cardiovascular-renal diseases. Instead of this, the JNC V report gives us a transition zone from normal pressure to the high normal range, which is very important in the African-American population. It also stages hypertension according to both systolic and diastolic blood pressure levels. The stage is determined by the highest level of blood pressure, whether systolic or diastolic. Therefore, if the systolic was 160 and the diastolic was 94, this would be classified as a Stage 2.

Another thing that this report did was to finally increase the focus on the issue of systolic pressure, which is very important and probably in relative terms more important than diastolic pressure for determining blood pressure-related risk. Many times when we talk about high blood pressure, we think that we are treating a number and sometimes we get fooled. What we are really treating is a surrogate marker for future risk. And clearly blood pressure is a prominent risk factor for a serious cardiovascular risk condition, that is, left ventricle hypertrophy (LVH), but so is body size, obesity, and physical activity or inactivity. But blood pressure is a powerful risk factor for LVH.

Congestive heart failure (CHF), a devastating consequence of prolonged elevated levels of systolic blood

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pressure, is the type of cardiovascular endpoint condition that I see a lot in my region. A sizeable proportion of CHF is due to poorly controlled blood pressure over the long term. Renal failure and renal insufficiency (also known as end-stage renal disease), where renal replacement therapy is needed, also is a blood pressure-related complication, as is stroke, peripheral arterial disease, and premature death in general.

This is true whether you are African American or white, but it is more likely if you are African American. Many of these conditions are not absolute in the sense that they are present in one group and not in the other; they are just relatively more common in one demographic group than another.

These data are population-based observations from the 1960s all the way through Phase I of NHANES III, 1988 and 1991, looking at the age-adjusted mean systolic pressure levels in the noninstitutionalized US population, 18 to 74 years of age. Over time, in both men and women, there was an initial rise in blood pressure followed by a steady decline over the years in average pressure in the noninstitutionalized population. This is a positive trend downward, which not only has pulled the center part of the blood pressure distribution down, but also has pulled the tails of the distribution down, at least the high tail, and reduced the incidence of high blood pressure as well. What this means is that mean arterial pressures are declining in the United States.

For the prevalence of hypertension in the US population, among black men during this timeframe, the age-specific prevalence of hypertension, using the 140/90 cut point and 18 to 74 years of age, the 1988 and 1991 Phase I NHANES III data show that hypertension prevalence at each age category, with the exception of the older age categories, is lower than it was in previous years. This again suggests that all the news is not bad and that over time we are doing a good job in lowering the hypertension burden by reducing the number of people who are in the upper extreme cut points of the blood pressure distribution.

It is important to note that one does not have to have hypertension to have blood pressure-associated risk. The risk starts well within the normal (<140/90 mm Hg) blood pressure range, but it escalates above these cut points of 140 and 160 systolic and the rise in risk is much steeper. Again, a very similar pattern was found among African-American women from 18 to 74 years of age: from 1988 to 1991 at each given age category, the prevalence of hypertension is less than it was in previous years.

It is a mistake to believe that all of this was due to medical treatment. Much of it was accomplished through changing lifestyle. Certainly some of the change is probably due to treatment, but a lot of it has to do with changing lifestyles—reducing alcohol, increasing activity, and limiting the amount of sodium in the diet—as opposed simply to medical treatment.

In the distribution of blood pressure levels in the US adult male population of non-Hispanic blacks and non-Hispanic whites, for Stage I hypertension, the prevalence is roughly 25% in African-American men and about 21% in white men. Again, more prevalent in African Americans, but a problem in both groups.

An interesting fact is that when men are compared with women, optimal blood pressures, or pressures less than 120/80, are much more common among both African-American women and white women than in their male counterparts. The high normal blood pressure range is really a transition zone because blood pressure tracks over time and is really a “feeder system” for the higher levels of blood pressure.

Almost 60% of non-Hispanic white women and almost 55% of non-Hispanic black women have optimal blood pressures of less than 120/80. That is good news.

There is a very severe type of hypertension—a most lethal form of hypertension—where the diastolic pressure is less than 90, which is therefore normal, but the systolic pressure is consistently over 160. It is called isolated systolic hypertension (ISH) and is defined by increased peripheral resistance pathophysiologically, probably much more so by vascular stiffening or noncompliance of the arterial vasculature. Isolated systolic hypertension is more common in women than men. It is very uncommon before the age of 55 unless a person has anemia, diabetes mellitus (which probably causes a premature aging of the vascular tree), beriberi, or Paget's disease. From working frequently with vascular surgeons at Bowman Gray, I have learned that ISH can also result when a tear in the aorta is grafted. Within hours after surgery, the patient develops sustained isolated systolic hypertension.

This very lethal form of hypertension is the most common form of hypertension after age 70 and occurs in approximately 12% to 13% of African-American women aged 55 to 74 years.

Another interesting fact is that physicians tend to take systolic hypertension less seriously than diastolic hypertension and do not intervene as aggressively. Hypertension awareness and treatment data from national surveys show that the general trend over time

is that the percentages are going up, from 33% in 1960 to 1962, up to 83% in 1988 to 1991 for identification of hypertension in African-American men. This positive trend was accomplished by much hard grassroots work by the National Heart, Lung, and Blood Institute, American Heart Association, local church-based groups, and professional organizations to disseminate information on hypertension.

In women, we see a very similar trend where identification rates are high and treatment rates are high. Women in general, whether black or white, tend to be on treatment more than men.

A fact that really disturbs me is that although we identify and treat many patients with hypertension, we only control about 21% of hypertension. Much of the recent treatment debate has been about whether we are driving people's blood pressure too low. However, the fact is that in a free-living population, people do not get their blood pressure controlled very often. Only about one in five free-living hypertensives gets below 140/90, according to the most recent NHANES III.

The two most recent NHANES surveys for the four race/gender groups looked at the overall population of hypertensives versus those who are on treatment. Among those who are treated, the percentage of control to less than 140/90 is going up, yet it still is inadequate and really is only above 50% in white men and white women. I believe the percentages are even higher than that in North Carolina and in other southeastern regions of the United States. This means that we still have a lot of work to do even after we identify the people who need treatment.

Bill Wiist and I published data in the *Journal of Ethnicity and Disease* several years ago on our study of a church-based group of African Americans. These were 661 men and women who participated in our church-based cholesterol education program and were screened for cardiovascular risk factors. The average participant age was 47, and there was a slight upper-socioeconomic-status skew to our study group. We studied what taking blood pressure medications means for people who are of the same age and body size.

What we found was that for people taking medications, after adjusting for age and body size, compared to people who were not taking medications, their systolic and diastolic pressures were about 7, 8, 9, or so mm Hg higher. This observation means that those people were not being adequately treated. It is not all the physician's fault, although I think we have to accept some of the blame because many times we are lax in regard to blood

pressure normalization. On the other hand, there are many reasons why people do not get their blood pressure controlled. Some of these are legitimate and some of it is a lack of diligence on our part after we identify those who need to have their hypertension controlled.

Now let us go back to the high risk, the high normal blood pressure categories, and look at what it means in young adults. Women 18 to 30 years of age participated in another NHLBI-funded study, the CARDIA study. It was conducted at four centers, and I was the PI at the Minnesota site. In black and white men and black and white women with normal blood pressure (<130/85 mm Hg) at baseline, the 7-year risk of hypertension (starting in the mid-1980s and culminating in the early 1990s) was very low.

For those people with high normal blood pressure, in the range of 130 to 139 systolic and 85 to 89 mm Hg diastolic as their highest pressure, we observed that 34.5% of African-American women 18 to 30 years of age developed hypertension within a 7-year timeframe. About 16% of African-American men did and about 5% to 6% of whites did.

The relative risks compared to the normotensive group were fairly high, almost 15 in black women and about 7.5 to 8 in black men. This is disturbing because it tells us that if you are African American, once you transition out of the normal into the high normal range, you are likely to be quickly propelled into the hypertensive blood pressure range.

In 1985 and 1986, we looked at baseline blood pressure categories (normal, high normal, and hypertension cut points) in black and white women. Five years later, we performed echocardiograms, measured left ventricle mass, and determined the prevalence of left ventricular hypertrophy according to the baseline blood pressures. In 1985-1986, 27.8% of African-American women who were in the high normal range had left ventricular hypertrophy. Moreover, 30% of African-American women who had been in the hypertensive range had left ventricular hypertrophy. Even 12% of the African-American women who had normal blood pressure in 1985-1986 had echo LVH in 1990-1991.

We saw a similar trend among white women, but the risk gradient was less steep. Therefore, high normal blood pressure is a very powerful marker for blood pressure-associated cardiac target-organ damage, at least in African-American women and to a lesser degree in white women. I find those numbers very disturbing, and they compel the national strategy for primary prevention.

Our analysis examined data on systolic blood pressure and cause-specific mortality in the MRFIT data set for men aged 35 to 37 years who were followed in the national death indices looking at the risk of renal disease mortality (not morbidity) according to baseline blood pressure level. We found a clear curvilinear gradient that is greater for black men than for white men at pressures even within the normal range or mildly elevated blood pressure range. In this analysis we did not examine cardiovascular-renal morbidity although this data set has now been linked with another data set containing information on morbidity.

Stroke is a very common blood pressure-related complication, and it is worth noting that if you are a survivor of a stroke you are much more likely to die of coronary disease than of a recurrent stroke.

In the southeastern part of the United States, the stroke mortality rate for black men is about 50% higher

than for black men residing in other regions of the country. A similar but less striking trend exists in black women. Stroke mortality rates are slightly higher for white women in the Southeast region of the United States. Among white men, there is no geographic gradient for stroke mortality.

We have already seen data from Dr Francis showing that African Americans have higher stroke rates than whites. But there are additional issues related to stroke as well as probably renal disease for African Americans living in the southeastern United States, where they have a higher risk than the African Americans living elsewhere in the country. About half of our total African-American population, 25 to 26 million people, live in the southeastern region of the country. This is a tremendous public health problem that shows a curious geographical distribution.

High Blood Pressure Affects Many Americans

Nearly 1 in 4 Americans has high blood pressure, a major risk factor for heart disease and stroke.

For more information on preventing high blood pressure, call
1-800-575-WELL

Source: National Heart, Lung, and Blood Institute; National High Blood Pressure Education Program.