

HEALTH

DNA TEST TIES AFRICAN-AMERICAN HERITAGE TO HIGH BLOOD PRESSURE

CHICAGO—Using a classical method of DNA analysis, California investigators told an American Heart Association meeting that they and their colleagues from Barbados have uncovered evidence that a gene or genes of African origin may be related to the greater prevalence of high blood pressure among African-Americans and other Western Hemisphere blacks.

DNA, or deoxyribonucleic acid, is the fundamental component of all living matter that controls and transmits hereditary information.

The technique, called mitochondrial DNA analysis, showed that black individuals in Barbados, who have a maternal genetic African heritage, have higher blood pressures than those who have a non-African maternal heritage, says Clarence Grim, M.D., director of the Drew/UCLA Hypertension Research Center at Charles R. Drew University of Medicine and Science, Los Angeles.

"The studies provide strong evidence that a greater African genetic heritage tends to be associated with a higher blood pressure in Western Hemisphere blacks," he says. "And this is compatible with the theory that there is transmission of a gene or genes for higher blood pressure, which has been suggested by our previous studies in black twins living in Los Angeles and Barbados."

African-Americans and other Western Hemisphere blacks have twice the rate of high blood pressure experienced by Americans of

European, Hispanic or Amerindian ancestry. Stress, diet, salt intake and other factors have been blamed for the high susceptibility among African-Americans. Genetic factors have been implicated, but without much substantive evidence. However, Grim suggests a major genetic factor may have evolved during the slavery period of Western Hemisphere history when deaths due to excessive salt losses may have killed many blacks during and after their transport from Africa.

To test this "survival hypothesis," Grim and his colleagues carried out studies using mitochondrial DNA analysis on a group of 50 black twins from the Caribbean island of Barbados. These studies indicate genes may indeed play a role in high blood pressure.

Mitochondria are structures within cells that act as micro-miniature "engines," producing energy for cell functions. They have their own DNA that can be used to trace an individual's maternal lineage. Grim found that highest systolic blood pressures (the pressure exerted by the heart when it beats) were in individuals who mitochondrial DNA had an African lineage: 122 millimeters of mercury (mm Hg), compared to 115 mm Hg for the group less likely to be of African lineage.

Those with the elevated pressures also had lower levels of the adrenal hormone, aldosterone, which helps maintain fluid balance by retaining salt. Low levels of this hormone indicate excess salt in the body.

Grim says the studies are compatible with the idea that Western Hemisphere blacks, including many African-Americans, carry a "salt-retention gene" that increases body salt and water and increases blood pressure. Untreated, high blood pressure can lead to kidney failure and stroke.

"African Americans have the highest rate of high blood pressure in the world," Grim says. "But if this is due to an inherited sensitivity to the blood-pressure raising effects of salt, it may be possible to eliminate much of the disease in the black community by changing dietary salt intake."

Grim urges anyone with elevated blood pressure, especially African Americans, to consult with their physician to try to lower salt intake."

Grim urges anyone with elevated blood pressure, especially African Americans, to consult with their physician to try to lower salt consumption. The AHA recommends daily salt intake not exceed one-half teaspoon of salt, but some individuals may have to reduce it even further, says Grim.

Future DNA studies, he says, will make use of other types of DNA, located on Y (male) chromosome, that should reveal information regarding African paternal lineage.

Genetic studies using mitochondria have limitations, since the DNA found there is strictly "female" (inherited from the mother.) "This is because all mitochondrial DNA comes from the egg, which of course, only contains genetic information from the mother," explains Grim.

But mitochondrial and Y-chromosome DNA analysis might pro-

vide an easy way to identify those at the greatest risk of developing salt-sensitive high blood pressure, including children, says Grim. "If we had a marker, we'd try to prevent it in children, (through diet.)"

The investigator says the ultimate goal is to find the gene responsible for salt-retention. Not only would a gene provide a way to develop a more accurate diagnostic test, it would go a long way toward settling the question of why African-American adults suffer more from high blood pressure.

Grim's co-authors from Drew University are R.W. Miller, M.D.; T.W. Wilson, Ph.D., M.P.H.; and A. Ansari, M.D. Other co-authors are N. Fichel-Ghodsian, M.D., Cedars-Sinai; and G.D. Nicholson, M.D.; H.S. Fraser, M.D.; and T.A. Hassel, M.D., of the Queen Elizabeth Hospital in the West Indies, Barbados.

VIEW FROM HHS

by Louis W. Sullivan, M.D.



Is Social Security safe? Will it still be providing benefits when today's workers retire? And—is Social Security a fair deal for black Americans?

The answer to all three questions is—YES!

It's natural for people to be concerned about a program that is so important to their financial security. But that doesn't mean we should believe myths and misconceptions.

Social Security Commissioner Gwendolyn S. King knocked down these myths in a recent speech at the National Press Club. Hopefully, her timely comments will help improve understanding and dispel unfounded claims that undermine confidence and support for the Social Security system.

I wholeheartedly support Commissioner King's efforts to set the record straight. For example:

Today, for many reasons (which change!) blacks on average have shorter life spans than do whites. Detractors of Social Security say that makes the program inherently discriminatory, taking black workers' taxes without a fair return. The community has no stake in its future, they say. But nothing could be further from the truth!

That's because Social Security is not just a retirement program. Rather, it includes Old Age and Survivors and Disability Insurance.

It is, as Commissioner King pointed out, precisely because of the higher-than-average black mortality rates, as well as the high rates of illness and disability that afflict our community, that Social Security is such a critically important program for black Americans.

Every month 4.5 million individuals and family members depend on Social Security disability checks and another 7.2 million collect survivors benefits. These benefits prevent families from being financially devastated by the early or unexpected loss of a breadwinner. Indeed, Social Security Survivors Insurance is one of



the nation's most important programs for black families. Benefits are paid to a surviving spouse and to children from birth to age 18—to 19 if the child is a full-time secondary school student.

Consider this: the Survivors Insurance program offers families protection equivalent to a life insurance policy with a face value of \$85,000; and for young families with two or more children the value of that protection can be as high as \$390,000. A fair deal, indeed!

And consider this: Each month SSA through its Old Age, Survivors and Disability Insurance program and through the needs-based assistance program called Supplemental Security Income provides more than a billion dollars in benefits to more than three million children under the age of 18—nearly as much as paid to all families and children through the Aid to Families with Dependent Children program.

The clear truth is that Social Security makes a tremendously important financial difference in the lives of many young and old persons in the black community. And it will continue to be there for us and for our children.

(Dr. Sullivan is U.S. secretary of health and human services.)

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