

# Treat Hypertension, Nix Kidney Failure

Treating elevated blood pressure can halt — and even repair — kidney damage caused by the disorder, according to a new analysis of a large study. However, the renal benefits of lowering blood pressure extend only to nonblacks: For as-yet-unknown reasons, blacks with hypertension tend to go on to develop kidney damage whether they receive treatment for the disorder or not, the study found.

The results represent the first time researchers have proved that mild hypertension — defined as blood pressure between 140/90 millimeters of mercury (mm Hg) and 159/99 mm Hg — or moderate hypertension — between 160/100 mm Hg and 179/109 mm Hg — in fact impairs kidney function. Previous studies only suggested a link between kidney damage and blood pressures in either of these two ranges, which physicians now refer to as stage 1 and stage 2 hypertension, respectively (SN: 11/7/92, p.311).

Kidney dialysis centers estimate that the renal failure of roughly one-third of all new dialysis patients derives from damage caused by hypertension. Besides severely curtailing patients' lives, these new dialysis cases add approximately \$300 million per year to already spiraling U.S. health care costs, according to the National Institute of Diabetes and Digestive and Kidney Diseases in Bethesda, Md.

To confirm the hypertension-kidney damage connection, a research team led by W. Gordon Walker of Johns Hopkins University School of Medicine in Baltimore measured concentrations of a waste protein called creatinine in the blood of 5,524 hypertensive men of all races. Because the kidneys usually filter creatinine — a by-product of normal metabolism — out of the blood and into the urine, blood creatinine measurements can indicate whether a patient's kidneys are working properly.

The men studied by Walker's group were a subset of participants in the Multiple Risk Factor Intervention Trial (MRFIT), an even larger study evaluating measures to prevent heart disease among men at risk for the disorder because of cigarette smoking, elevated blood cholesterol, or elevated blood pressure. As part of the MRFIT design, roughly half of the men were given a standardized regimen of drug therapy and put on a modified diet to control their blood pressure. The other half received a variety of different drugs and diet advice from their own physicians.

Walker's group found that the same treatments effectively controlled blood pressure among both blacks and non-blacks, most of whom were white. However, the blood creatinine concentrations

of blacks continued to rise, despite reductions in blood pressure, indicating ongoing kidney damage. In contrast, the creatinine concentrations in nonblacks successfully treated for hypertension either stabilized or dropped, signaling that their kidneys were either getting no worse or recovering. The patients were followed an average of seven years.

The researchers conclude that while they cannot explain this racial difference, "the proposition that blacks are more susceptible to renal damage from elevated blood pressure than whites must be considered." But they caution that the number of blacks in their study — 463, or less than 9 percent of all participants — may have been too small to draw definitive conclusions.

Walker and his colleagues report their results in the Dec. 2 *JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*.

"The good news," writes Robert G. Luke of the University of Cincinnati Medical Center in an editorial accompanying the new report, "is that efficient blood pressure treatment . . . can probably prevent the annual incidence of end-

stage renal disease due to hypertension in patients over 65 years of age from increasing" — primarily by lowering the incidence of the disorder among whites. However, he warns, "the bad news . . . is that progressive renal impairment may not be prevented in African Americans by what is currently accepted as excellent blood pressure control."

"This study is an important advance in our ability to combat the effects of high blood pressure," comments Claude Lenfant, director of the National Heart, Lung, and Blood Institute, which administered the 1973–1982 MRFIT study. Following the study's findings, he says, "millions of patients are now known to be at risk for kidney dysfunction if stages 1 and 2 hypertension go untreated."

Lenfant says his institute is planning to launch another study to determine why hypertension treatment that prevents kidney damage among whites doesn't work for blacks. The study — scheduled to begin next year and to involve several medical centers throughout the United States — will also examine the causes of hypertension among blacks, he says. — C. Ezzell

## Large prehistoric earthquake ripped Seattle

On a wintry day about 1,000 years ago, a fault running beneath the site of Seattle's Kingdome let loose a whopper of an earthquake that sent a tsunami wave sloshing through Puget Sound. The ground shook with such fury that avalanches tumbled from the Olympic mountains and landslides ran into Lake Washington, near where some of Seattle's tonier neighborhoods now stand.

No written documents record the quake. But through a remarkable series of complementary studies, several teams of geologists have pieced together enough evidence to show that a strong quake did strike Seattle — a realization that will force hazard planners there to reconsider the seismic risk to their city. Until now, seismologists had not considered a threat so close to Seattle.

The separate research groups present evidence of the prehistoric quake in five papers published in the Dec. 4 *SCIENCE*.

"It's a combination of all these diverse lines of evidence that suggests there was a large earthquake in the Seattle area about 1,000 years ago. What this has shown is that something like this can happen, which wasn't known before," says geologist Robert C. Bucknam of the U.S. Geological Survey in Denver.

The convergence of geologic techniques used in this case study can also help researchers study the seismic haz-

ard of other regions around the globe.

Bucknam and his colleagues discovered evidence of the prehistoric Seattle earthquake while studying a raised terrace at Restoration Point on Puget Sound. Cut by ocean waves, the terrace once lay at sea level. But the former shoreline now sits some 7 meters above high-tide level. Bucknam's group believes the land must have risen quite abruptly, because the ocean did not cut any terraces between the current and former shorelines. Carbon-14 dating of organic material on the terrace indicates that the uplift occurred between 500 and 1,700 years ago.

This raised shoreline at Restoration Point and another one in Seattle lie directly south of a geologic structure that parallels interstate 90, running in an east-west direction through the city. Geologists have suspected the structure was a fault and this year named it the Seattle fault. But until Bucknam's group documented the evidence of uplift, it remained unclear whether the fault was active.

While land south of the fault went up, Bucknam's group sees a different story on the fault's northern side. At Winslow, just 5 kilometers north of Restoration Point, the land hasn't gone through any sudden change in level during the last 2,000 years. This finding helps provide a measure of the prehistoric earthquake's size. In 1980, a magnitude 7.3 earthquake in Egypt