Hypertension-driven disease rapidly rising in sub-Saharan Africa

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Based on the experience of a large hospital in Tanzania, Weill Cornell Medical College researchers have discovered a "startlingly" high burden of hypertension in this sub-Saharan African country.

In the *Journal of Hypertension*, the researchers say non-communicable disease—driven primarily by hypertension, resulting in stroke and other cardiovascular diseases—accounted for nearly half of the deaths and admissions during a three-year period at Weill Bugando Medical Center, one of Tanzania's preeminent teaching hospitals.

Previous research has hinted that hypertension may be a rising health issue in Tanzania, but this study, the first large prospective evaluation of hospital diagnoses and death, provides hard, confirmatory data, according to the researchers.

It paints a picture of an African country in which infectious and tropical diseases are declining, while stroke and other non-communicable diseases are rapidly increasing, says the study's lead author, Dr. Robert Peck, an assistant professor of medicine and pediatrics at Weill Cornell Medical College and Weill Bugando Medical College.

"This is a striking finding, because most people assume that stroke is a disease of the developed world," says Dr. Peck, who has worked in Tanzania for six years. "To the contrary, our study shows the tremendous burden of stroke among adult inpatients at a typical African hospital.

"It may be that the exploding epidemic of hypertension-driven, non-communicable disease we found in Tanzania is occurring in other African nations," he says. "These findings have important implications for public health and medical intervention in sub-Saharan Africa, where communicable diseases have always been the top priority."

Death from hypertension was second only to HIV mortality

Weill Bugando, located in Mwanza, northwestern Tanzania, opened in September 2003 and has been affiliated with Weill Cornell Medical Center since its inception.

Tanzania has the lowest ratio of physicians to patients in the world—one physician per 50,000 patients, says the study's senior investigator, Dr. Daniel Fitzgerald, co-director of the Weill Cornell Medical College's Center for Global Health. The Center has programs in Brazil, Haiti, Tanzania and other countries.

"Of the 42 million people living in Tanzania, approximately 34 million will never see a doctor in their lifetime," says Dr. Fitzgerald. "This lack of human health resources contributes to Tanzania's major health inequities and motivates Weill Cornell in its mission to deliver the best education possible to future Tanzanian physicians."

Since arriving at Weill Bugando Medical College, Dr. Peck has coordinated in-hospital training of Tanzanian students and residents in the Department of Medicine. He also conducts research on the epidemiology and optimal management of chronic diseases in Tanzania, including hypertension, kidney disease, and diabetes.

This study aimed to provide a profile of diseases in Tanzania that result

in hospitalization, Dr. Peck says. It recorded diagnoses of patients admitted to the 900-bed hospital between 2009 and 2011, along with their age, sex, length of hospitalization, and in-hospital mortality.

The researchers documented 11,045 admissions during this time period; the median age for hospitalized patients was 40 years old. They found that non-communicable diseases accounted for nearly half of admissions, hospital stays, and deaths. Hypertension-related diseases were the most common non-communicable disease.

The leading three causes of death were HIV (684 deaths), hypertension (314 deaths) and non-hypertensive heart failure (123 deaths). Of the 10 most common causes of death, six—or 45 percent—were due to non-communicable diseases. Hypertension accounted for 34 percent of these deaths and 15 percent of all deaths.

Hypertension was the leading cause of death in patients more than 50 years old, and more than half of hypertension-related deaths occurred before age 65.

"Simply put, hypertension is the leading cause of non-communicable disease-related hospital mortality and healthcare utilization at our hospital," Dr. Peck says. "Nearly 10 percent of all adult hospital admissions at Weill Bugando were due to stroke, and stroke was the leading cause of hypertension-related death.

"This massive burden of stroke in sub-Saharan African countries such as Tanzania is likely due to the high prevalence of severe and untreated hypertension," he says. "Among adults in our region, nearly 20 percent have hypertension."

Need to screen for hypertension

The reasons for the rise of hypertension in Tanzania are not known, but Dr. Peck offers a few theories.

"Urbanization and industrialization are occurring very rapidly in sub-Saharan African countries such as Tanzania. Fifty years ago less than 10 percent of the sub-Saharan African population lived in cities; almost all Tanzanians were farmers who worked in the field and ate what they grew," he says.

"Now more than 50 percent of Tanzanians live in cities, and they work in non-labor jobs. Rapid urbanization and industrialization has also brought rapid changes in diet, including increased consumption of processed foods high in fat and salt. Still, typical Western fast food has not yet arrived here, and the prevalence of obesity here remains lower than in the U.S."

Dr. Peck adds that, as seen among African-Americans in the U.S., "there may be a predisposition to hypertension and stroke in Africa. We do not know that for sure. Nonetheless, adding rapid urbanization and change in diet and exercise to this predisposition could help explain this exploding epidemic."

Many things can be done to help, he says. "We need to increase community awareness of hypertension and its complications so that Tanzanians will want to be tested and will be motivated to adhere to their antihypertensive therapy if they have hypertension.

"We also need to improve primary care health systems for hypertension screening and longitudinal care," Dr. Peck says. "Studies need to be conducted that will help us better understand the underlying pathophysiology of hypertension in this population in order to design and target efforts to prevent hypertension in sub-Saharan Africa."

Dr. Peck and the Weill Bugando team are already working with the Tanzanian National Institute of Medical Research and the London School of Hygiene and Tropical Medicine, to design strategies to improve community awareness and primary care systems.

The goal of Weill Cornell's Center for Global Health "is to develop innovative health interventions that will save lives in resource poor countries," says Dr. Fitzgerald. "We build the capacity of international partner institutions through the training of their clinicians, researchers, and educators.

"This study is an example of how the Center is moving from infectious diseases to other major causes of mortality in Africa and the world, such as chronic diseases, maternal-child health, and trauma," he says.

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