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Racial differences and disability after stroke

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In their article “Racial differences in disability after stroke: Results from a nationwide study,” Burke and colleagues¹ tried to better understand how race might affect recovery after a stroke. The problem of stroke is large: about 7,000,000 people in the United States are survivors of stroke. That number is getting bigger. Stroke is a problem that mainly affects older individuals. As the US population ages, there will be more people at risk for stroke. In addition, modern medical care has reduced the risk of dying from a stroke, meaning that there will be more survivors of this serious medical illness.

Several studies have tried to look at how race might affect stroke. It has long been observed that black people (non-Hispanic blacks) have twice the number of strokes as white people (non-Hispanic whites). Some studies in small communities have suggested that black people do not recover as well as white people after a stroke. Another way of saying this is that compared to white people, black people have greater limitations in their activities after stroke. Other studies, however, have not found this difference. Why do different studies give different answers? Does race affect outcomes after stroke? If there is a difference, why is this? These were some of the questions that Burke and colleagues tried to understand.

HOW WAS THE STUDY DONE? Burke and colleagues at the University of Michigan looked at older people across the United States. The people had been enrolled in the 2011 National Health and Aging Trends Study (NHATS). NHATS is an annual face-to-face interview of Medicare beneficiaries (ages 65 years and older). More than 8,000 people are involved in NHATS. In that group, about 900 had a stroke. The people in this study told the researchers that they had had a stroke by answering the simple question, “Has a doctor ever told you that you had a stroke?”

The stroke survivors answered many questions about their activities, including limitations following the stroke. For instance, they described problems with eating, bathing/showering, dressing, getting out of bed, getting around within the home, and being mobile outside of the home. Additional questions asked about doing laundry, grocery shopping, making hot meals, paying bills (banking), and taking medications.

Social and civic activities were also a concern. The stroke survivors answered many questions about how they participate in social activities. For instance, had they visited with friends or family (not living in the same home)? Had they attended religious services or participated in a club? Had they attended any classes or other organized activities? Had they gone out for enjoyment (like dinner, a movie, or a play)? Follow-up questions tried to understand both how important these activities were to the person and how the stroke had affected the person’s ability to participate in the activity.

In order to understand other potential differences, NHATS had collected background information on each participant. For instance, they collected information on marital status (married or not), education (less than high school, high school graduate, or college graduate and beyond), income, age, and sex.

NHATS measured how a person was doing in 2 ways. First, they asked the person to tell them how they were doing. Mainly, this was in the form of a questionnaire. The participants graded their physical capacity using a point scale. In addition, NHATS used physical tasks to see how each person was doing. Participants were graded based on how well they did on a 4-meter (about 12 feet) walk, repeated chair stands, and balance testing.

Burke and colleagues knew that there are many factors that could contribute to how a person does after stroke. Recognizing this, the researchers grouped the participants in several ways in order to better understand which factors might most affect how a person does after a stroke. For instance, they looked at sociodemographic factors such as age, sex, education, income, and marital status. They also looked at how the presence of other illnesses might affect a person’s activities after a stroke. In addition, they tried to understand how cognitive function might affect a person’s limitations following a stroke.

WHAT WERE THE RESULTS? Of the 806 stroke survivors studied, 581 were white and 228 were black. There was no difference in age or sex between the groups. However, black participants were less educated and had a lower income. They were also less likely to be married than white participants. Black participants were more likely to have high blood pressure. However, white participants were more likely to

have other illnesses such as heart disease, cancer, and osteoporosis.

In general, activity limitations after stroke were more common in black participants than white participants. When adjusted for physical capacity, however, these differences went away. The only exception was that even after adjusting for physical capacity, black participants had a greater degree of problems with banking and bills than white participants. Between the 2 groups, the only difference in social activities was in attending religious services. Black participants reported a greater degree of difficulty attending religious services (after a stroke) than white participants. The difference was smaller when the researchers accounted for physical capacity. The difference went away when they accounted for cognitive functioning.

WHAT DO THE RESULTS MEAN? The first concern is that in the United States, older black people have a higher degree of limitations after stroke than white people. They had more problems with self-care, mobility, and household activities. Another way of thinking about this is that the black stroke survivors (and their caregivers) carry a greater burden than the white stroke survivors. This difference did not “even out” when accounting for sociodemographic factors. In short, the greater degree of limitations seems to be directly related to the stroke itself.

This leads to the next question: why do black people who have a stroke perform less well than white people? Perhaps one possibility is that there was a difference in the physical capacity of each group *before* the stroke occurred. If this is true, the difference might be related to how well a person was doing before having a stroke.

Perhaps there is a racial (genetic?) difference in biology. The mechanism of stroke (the way the stroke occurs) in black people might be different from white people. For instance, studies have shown that white people are more likely to have strokes due to blood clots that form in the heart (called cardioembolic strokes). Cardioembolic strokes are more severe and result in greater disabilities. Knowing this, however, we would expect white people to have greater disability after a stroke than black people. In the study by Burke and colleagues, the opposite was observed.

Perhaps the quality of care at the time of the stroke makes a difference. There have been many studies that have tried to address this concern. For instance,

generally speaking, white people are more likely to receive tissue plasminogen activator (tPA, an emergency treatment for stroke) than black people. In order to work, tPA must be given in the hours immediately following the stroke. If a person “waits” too long or is unable to get to the hospital quickly, he or she cannot have this treatment (waiting too long makes the treatment more dangerous). When looking at people who arrived at the emergency department within 2 hours of their stroke, there was no racial difference as to who received tPA. In other words, the “racial” difference regarding stroke treatment (at least in regards to tPA) seems to be due to the delay in getting to the hospital quickly. Once at the hospital, there was no difference in terms of who received the stroke therapy.

If not due to prestroke factors or differences at the time of the stroke, perhaps the racial difference is due to the care people receive *after* their stroke. Intense rehabilitation after a stroke results in fewer limitations. Some studies have suggested that black people are less likely than white people to receive intense poststroke rehabilitation. The reason for this difference is unclear.

There are several limitations to the study by Burke and colleagues. It does not take into account the number of strokes a person might have had. In addition, the study evaluated stroke survivors who were living at home. It did not look at people who were in long-term care facilities after a stroke. Finally, the study could not take into account the time that the stroke occurred. For instance, most people who have a stroke have a great degree of disability right after the stroke. This often improves over time. When the stroke occurred (how long ago) would affect how the survivors responded to the questions.

WHY IS THIS IMPORTANT? Although this study did not answer all of these questions, it highlighted a very challenging problem: black people have a greater degree of disability after stroke than white people. This study emphasizes the need for more research in this area. As we understand the problem better, we can develop better ways to address it.

REFERENCE

1. Burke JF, Freedman VA, Lisabeth LD, Brown DL, Haggins A, Skolarus LE. Racial differences in disability after stroke: results from a nationwide study. *Neurology* 2014; 83:390–397.

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About stroke

Adapted from: Leonard AD, Brey RL. Blood pressure control and stroke: An ounce of prevention is worth a pound of cure. Neurology 2002;59:E1–E2.

WHAT IS STROKE? A stroke, or brain attack, is caused by the sudden loss of blood flow to the brain or bleeding inside the head (see below for more details). A stroke causes brain cells to die. This damage can cause paralysis, speech problems, loss of feeling, memory and reasoning problems, coma, and possibly death. Fortunately, there are effective ways to prevent stroke. If you have a stroke, seeking immediate medical attention can help reduce your chances of death and disability.

WHAT ARE THE WARNING SIGNS OF STROKE? The “Give Me 5” uses easy-to-remember words to help identify the 5 signs of stroke:

- Walk—is their balance off?
- Talk—is their speech slurred or face droopy?
- Reach—is one side weak or numb?
- See—is their vision all or partly lost?
- Feel—is their headache severe?

HOW COMMON IS STROKE? Every year, about 780,000 people in the United States have a stroke and about 160,000 die. Stroke is the nation’s number 3 killer after heart disease and cancer. Stroke is the number one cause of adult disability.

Stroke is an emergency. Call 911 immediately if you or someone you know experiences any of the above warning signs. Jot down the time the symptoms started. Sometimes these warning signs last for only a few minutes and then stop. But even if that happens or if you feel better, call 911 for help.

RISK FACTORS FOR STROKE THAT CAN BE TREATED OR CHANGED

- High blood pressure
- Atrial fibrillation (an irregular heart beat)
- Diabetes
- Cigarette smoking
- Hyperlipidemia (high fat level in the blood)
- Alcohol abuse
- Obesity
- Sickle cell disease

WHAT CAUSES A STROKE? There are 2 types of stroke or brain attack. Ischemic stroke is caused by an interruption of blood flow to the brain. Hemorrhagic stroke is caused by bleeding inside the brain.

About 85% of all strokes are ischemic. Ischemic stroke can be caused by narrowing of the large arteries to the brain, also known as atherosclerosis. If a clot forms in the neck vessels, pieces can break off and block a brain blood vessel. Clots may also form in the heart and travel by blood flow to the brain vessels, where they become lodged.

Hemorrhagic stroke is caused by the bursting of a blood vessel in the brain. It accounts for about 15% of strokes. Subarachnoid hemorrhage occurs when there are weak spots on brain arteries (aneurysms) that burst and cover the brain with blood. Blood vessels in the brain can also burst if they are weakened by high blood pressure, diabetes, and aging.

WHAT ARE THE TREATMENTS FOR STROKE?

Immediate medical care is critical for the person who is having a stroke or brain attack. New treatments work only if given within a few hours after the onset of a stroke. For example, a clot-busting drug must be given within 3 hours of stroke onset.

HOW IS STROKE PREVENTED? Some risk factors—age, sex, race, and a history of stroke in the family—cannot be changed. However, many others can be controlled. Most controllable risk factors relate to the health of the heart and blood vessels. The following can help prevent stroke:

- Having regular medical checkups
- Controlling high blood pressure
- Not smoking; stopping if you do
- Treating heart disease, especially an irregular heart beat called atrial fibrillation
- Improving diet: avoid excess fat, salt, and alcohol
- Exercising
- Controlling diabetes
- Seeking immediate medical attention for warning signs of stroke

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