

Fruit and the brain: The more the better!

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"An apple a day keeps the doctor away." Sometimes old sayings have some truth to them. This old saying could be changed to "A serving of fruit a day keeps the heart attacks and strokes away." And, it turns out, the more servings the better!

Many studies have shown that eating fruits and vegetables is generally a healthy thing to do. This habit also reduces the risk of suffering from heart disease. In this issue of *Neurology*, a group of physicians in France looked for evidence that eating fruits and vegetables also decreases the risk of suffering stroke (or brain attack).¹ More information about stroke can be found on the next page.

How was the study done?

The researchers performed a meta-analysis of studies that examined whether or not fruit and vegetable intake lowered the risk of stroke. A meta-analysis uses information from existing studies done in a similar way to answer the same question. The goal of meta-analyses is to combine all of the information from these studies to get more accurate results than are possible from any of the individual studies.

This particular meta-analysis included studies with the following characteristics:

1. Prospective studies (for example, a group of subjects is selected and watched for a decade).
2. Studies including stroke or brain attack.
3. Studies in which the amount of fruit and vegetables consumed could be calculated (portions per day).

The researchers found seven studies between 1970 and 2004 with these characteristics. They studied a total of 232,049 patients (90,513

men and 141,536 women), with ages between 25 and 103 years. Five studies were from the United States, one was from Europe, and one was from Japan.

What did the study show?

The combined information from the seven studies showed that eating fruit reduced the risk of having a stroke. Each additional serving of fruit consumed per day decreased the risk of stroke by 11%. When looking at "fruit and vegetable" intake together, each additional serving eaten per day decreased the risk of stroke by about 5% (half of the reduction in risk of stroke provided by eating fruit). The reduction in the risk of stroke by

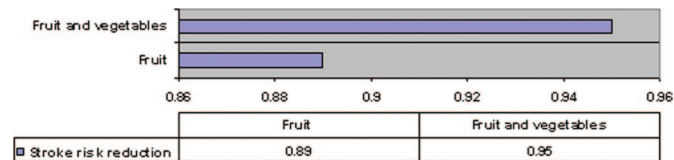
intake of vegetables alone was not large enough to be considered important.

How could eating fruit and vegetables prevent stroke?

This positive effect of eating fruit may be due to the positive effect it has on blood pressure and high cholesterol. High blood pressure and high cholesterol are strong risk factors for stroke. The results also suggest that the more fruit, the better!

What do the results of this study mean to me?

Eating fruit is simple, delicious, and inexpensive and can give more years of healthy life to you and your brain. Just do it!



Risk reduction of stroke by consumption of daily portions of fruit and fruit-vegetables. Risk reduction of stroke for one portion increment per day of "fruit and vegetable" (top) and fruit (bottom). Results for vegetable consumption are not shown, since some articles showed a positive effect (benefit) but one showed a negative effect. Results for vegetable consumption are considered nonsignificant with respect to risk of stroke.

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. A stroke can cause 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 develop a stroke, seeking immediate medical attention can help reduce your chances of death and disability.

How common is stroke?

Every year, about 750,000 people in the United States suffer a stroke and about 160,000 die. Stroke is the nation's number three 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 two 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.

Eighty percent 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 20% 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, and stopping if you do
- Treating heart disease, especially an irregular heartbeat called atrial fibrillation
- Improving diet: Avoid excess fat, salt, and alcohol
- Exercising
- Controlling diabetes
- Seeking immediate medical attention for warning signs of stroke

For more information

American Academy of Neurology
Education & Research Foundation
www.thebrainmatters.org

American Academy of Neurology
www.aan.com

American Stroke Association
A Division of the American Heart
Association
www.strokeassociation.org

National Stroke Association
www.stroke.org

Reference

1. Dauchet L, Amouyel P, Dallongeville J. Fruit and vegetable consumption and risk of stroke: a meta-analysis of cohort studies. *Neurology* 2005;65:1193–1197.

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