

Long-term obesity is linked to loss of brain tissue

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Obesity is a serious public health problem in all western societies. Nearly 60% of adults in the U.S. and 50% in Europe are classified as obese or overweight. Researchers usually measure overweight with a test called body mass index (BMI). BMI factors in both weight and height. A BMI between 25 and 29.9 is "overweight" and greater than or equal to 30 is "obese," according to the World Health Organization. Being overweight is a risk factor for diabetes and high blood pressure. Both of these conditions can cause damage leading to loss of brain tissue. Loss of brain tissue has been linked to poor cognitive function. One way to evaluate for loss of brain tissue is to take a picture of the brain using a test called computed tomography (CT) or magnetic resonance imaging (MRI). It is possible to see whether there is any loss of brain tissue in different parts of the brain. This is called "atrophy." Researchers are not sure what the real relationship is between being overweight and loss of brain tissue. It could be that being overweight "causes" diabetes and hypertension, which in turn, "cause" loss of brain tissue. It is also possible, however, that being overweight "causes" brain loss independent from these other conditions. More information about cognitive dysfunction and dementia can be found on the next page.

In this issue of *Neurology*, Gustafson et al.¹ report a study of 290 Swedish women born between 1908 and 1922. This purpose of the study was to determine whether being overweight is a risk factor for brain atrophy on CT or cognitive dysfunction. All of these women had undergone four evaluations occurring every 6 years, be-

ginning in 1968. These evaluations included general health information and measurements of weight, height (to determine BMI), and blood pressure. In the 1992 exam, these women also agreed to undergo cognitive testing and a CT scan of the brain.

Over the 24-year follow-up period, both BMI and cerebral atrophy steadily increased with age. Despite this, patients with a high BMI at each one of the four evaluations were much more likely to have atrophy on the brain CT scans. High BMI remained an important risk factor for brain atrophy in its own right even when other factors that can lead to brain atrophy (diabetes and hypertension) were factored in. (See figures 1 and 2 for examples of brain scans.)

The study did not find that either being overweight or brain atrophy was associated with cognitive dysfunction. The test that the researchers used to test for cognitive dysfunction was not very sensitive. This means that important, but subtle problems with cognition could have been missed. More studies need to be done to address this question. It is important to remember that among all of the other adverse health effects of obesity or being overweight, loss of brain tissue may also be one of them. If you suffer from obesity or are overweight, it is important to talk to your doctor about what you can do to lose weight and be healthier!

Reference

1. Gustafson D, Lissner L, Bengtsson C, Björkelund C, Skoog I. A 24-year follow-up of body mass index and cerebral atrophy. *Neurology* 2004;63:1876–1881.

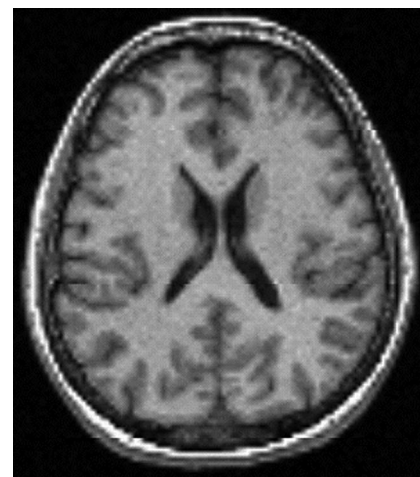


Figure 1. Brain scan from a normal person. The dark, butterfly-shaped area in the center of the brain is spinal fluid.

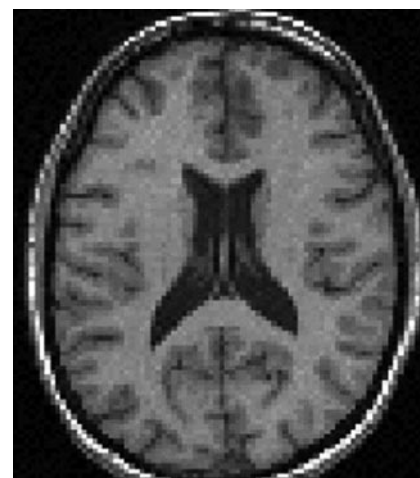


Figure 2. Brain scan from a person with a loss of brain tissue. The dark, butterfly-shaped area in the center of the brain is spinal fluid. It is larger than it should be because the spinal fluid expands to fill up the space left by loss of brain tissue.

What is dementia?

Dementia is a decline in mental functions that generally includes short and long-term memory, and is often associated with changes in language, logical thinking and personality. It persists over time, but in some specific cases it may be reversible. It interferes with job performance, relationships and eventually basic elements of self-care. Dementia tends to occur late in life, affecting about 1% at the age of 60, and increasing to over 35% by the age of 85.

Are all dementias the same?

No—there are several different types of dementia that vary by location within the brain and have widely different causes. In the early stages, signs of the disorder may be quite different and need early attention, because different types of treatment may be possible. The most common form of dementia is Alzheimer disease. Other common varieties include the vascular dementias, which are associated with strokes. Vascular dementias have various symptoms depending on whether the patient suffers large or small, single or multiple strokes, and what parts of the brain are injured. Vascular dementias are most common in people with high blood pressure and diabetes. Another type of dementia that is becoming better recognized is called dementia with Lewy bodies. In this form, there are problems with gait and balance, fluctuations in alertness and mental functions, hallucinations and delusions, falls, and episodes of unresponsiveness. Other varieties of dementia include those that involve the frontal lobes (the front part of the brain). In these dementias, personality changes, poor judgment, inappropriate behaviors, and lack of goal setting and planning are typical. Other forms of dementia are associated

with diseases such as HIV/AIDS, Parkinson disease, and various rare infectious diseases, including a variant of Mad Cow disease.

Which dementias may be reversible?

Less than 10% of dementias may be fully reversible, but these should always be considered. The most common are those that involve thyroid disease and low vitamin B12 levels, which may be detected with simple laboratory tests. Depression is common in the elderly and often associated with dementia. Treatment of depression may improve some signs of mental impairment. Previous infection with syphilis may occasionally be associated with dementia and should be tested if there are specific risk factors or evidence of prior infection. Another potentially reversible cause of dementia is “normal-pressure hydrocephalus” which is characterized by problems with gait, urinary incontinence and mental decline. A surgical procedure may reverse symptoms if treated early enough. Other diseases, infections, and even head injury may be associated with cognitive impairment and may be found by blood tests or brain imaging studies (e.g., CT or MRI scans). Correction or treatment of these underlying causes may lead to improvement in mental function.

What are the warning signs?

Patients rarely seek medical help for their symptoms because they are often unaware that there is a problem. This lack of insight is a common feature of the early stages of dementia. Sometimes families do not act either because they think the behaviors are a normal part of getting older. Problems with remembering recent events, such as whether or not a patient ate breakfast or took his or her medications, may occur in the early stages. Pa-

tients with early dementia may misplace personal belongings and accuse others of “stealing” them; or they may have difficulty finding words or names. Changes in behavior may also be common with increased irritability and defensiveness, especially when family members suggest that they may need medical help. Lack of attention to personal hygiene and dressing, and loss of interest in previous activities or hobbies may be warning signs. Behaviors that had previously been present may worsen to become socially inappropriate and suggest that a medical checkup is needed.

What should you do if you suspect dementia in a loved one?

Early diagnosis is key. It is critical to seek medical attention if you recognize or suspect symptoms of dementia. Routine laboratory testing may detect reversible causes of dementia. You may be referred to a doctor who specializes in dementia for further evaluation and treatment. Early treatments may help to slow the progression of some of the progressive dementias, such as Alzheimer disease. There are also changes that can be made in the patient’s environment as well as medications that may help treat some of the behavioral problems. The more the caregivers can learn about the dementia process and how to manage it, the longer the patient may be able to remain at home. Support systems include adult day care programs, computer and telephone support groups, and other respite programs. Research efforts should be supported to further the understanding, treatment, and prevention of dementias.

Other resources

American Academy of Neurology
www.aan.com
Alzheimer’s Association
www.alz.org