
Vascular dementia

A topic in the Alzheimer's Association® series on understanding dementia.

About dementia

Dementia is a condition in which a person has significant difficulty with daily functioning because of problems with thinking and memory. Dementia is not a single disease; it's an overall term — like heart disease — that covers a wide range of specific medical conditions, including Alzheimer's disease. Disorders grouped under the general term “dementia” are caused by abnormal brain changes. These changes trigger a decline in thinking skills, also known as cognitive abilities, severe enough to impair daily life and independent function. They also affect behavior, feelings and relationships.

Brain changes that cause dementia may be temporary, but they are most often permanent and worsen, leading to increasing disability and a shortened life span. Survival can vary widely, depending on such factors as the cause of the dementia, age at diagnosis and coexisting health conditions.

Vascular dementia

Vascular dementia is a decline in thinking skills caused by conditions that block or reduce blood flow to various regions of the brain, depriving them of oxygen and nutrients. Inadequate blood flow can damage and eventually kill cells anywhere in the body, but the brain is especially vulnerable.

In vascular dementia, changes in thinking skills sometimes occur suddenly after a stroke, which blocks major blood vessels in the brain. Thinking difficulties may also begin as mild changes that gradually worsen as a result of multiple minor strokes or another condition that affects smaller blood vessels, leading to widespread damage. A growing number of experts prefer the term “vascular cognitive impairment” (VCI) to “vascular dementia” because they feel it better expresses the concept that vascular thinking changes can range from mild to severe.

Vascular brain changes often coexist with changes linked to other types of dementia, including Alzheimer's disease and dementia with Lewy bodies. Several studies have found that vascular changes and other brain abnormalities may interact in ways that increase the likelihood of dementia diagnosis.

Prevalence

Vascular dementia is widely considered the second-most common type of dementia, after Alzheimer's. Only about 5% to 10% of people living with dementia have vascular dementia

alone. It is more common as a part of mixed dementia. In older individuals living with dementia, about 50% have pathologic evidence of vascular dementia, known as infarcts. The infarcts coexist with Alzheimer's pathology in most cases. Many experts are concerned that vascular dementia remains underdiagnosed — like Alzheimer's disease — even though it's recognized as a common disease. It's important to better understand the full extent of vascular dementia and dementia overall because there are well-supported strategies, including diet, exercise and medication, to reduce overall risk of diseases of the heart and blood vessels, including those in the brain.

Symptoms

The impact of vascular conditions on thinking skills varies widely, depending on the severity of the blood vessel damage and the part of the brain it affects. Memory loss may or may not be a significant symptom depending on the specific brain areas where blood flow is reduced. Vascular damage that starts in the brain areas important for storing and retrieving information may cause memory loss similar to that seen in Alzheimer's disease.

Symptoms due to vascular dementia may be most obvious when they happen soon after a major stroke. Sudden post-stroke changes in brain function may include confusion; disorientation; trouble speaking or physical stroke symptoms, such as a sudden headache; difficulty walking, poor balance, or numbness or paralysis on one side of the face or body. Severe depression is common in individuals living with vascular dementia, more so than in people with Alzheimer's disease.

Multiple small strokes or other conditions that affect blood vessels and nerve fibers deep inside the brain may cause more gradual thinking changes as damage accumulates. Common early signs of widespread small vessel disease are impaired planning and judgment, uncontrolled laughing and crying, declining ability to pay attention, impaired function in social situations and difficulty finding the right words.

Diagnosis

Diagnostic guidelines for vascular dementia have used a range of definitions for dementia and various approaches to diagnosis. In 2011, the American Heart Association and American Stroke Association issued a joint scientific statement on vascular contributions to mild cognitive impairment (MCI) and dementia. The

Alzheimer's Association participated in developing the statement, which is also endorsed by the American Academy of Neurology. The goals of the statement, which include practice recommendations, are to raise awareness of the importance of vascular factors in cognitive change, increase diagnostic consistency and accelerate research.

Under the diagnostic approach recommended in the statement, the following criteria suggest the greatest likelihood of MCI or dementia is caused by vascular changes:

1. The diagnosis of dementia or MCI is confirmed by neurocognitive testing, which involves several hours of written or computerized tests that provide detailed evaluation of specific thinking skills such as judgment, planning, problem-solving, reasoning and memory.
2. There is brain imaging evidence, usually with magnetic resonance imaging (MRI), confirming:
 - a. A recent stroke, or
 - b. Other vascular brain changes whose severity and pattern of affected tissue are consistent with the types of impairment documented in cognitive testing.
3. There is no evidence that nonvascular factors may be contributing to cognitive decline.

The statement also details variations in these criteria that may suggest a possibility rather than a strong likelihood that cognitive change is due to vascular factors.

Because vascular dementia often goes unrecognized, many experts recommend professional cognitive screening for everyone considered to be at high risk, including those who have had a stroke or a transient ischemic attack (TIA), also known as a ministroke, or who have risk factors for heart or blood vessel disease. Professional screening for depression is also recommended for high-risk groups. Depression commonly coexists with brain vascular disease and can contribute to cognitive impairment.

Causes and risk factors

Any condition that damages blood vessels anywhere in the body can cause brain changes linked to vascular dementia. As with Alzheimer's disease, advancing age is a major risk factor.

Additional risk factors for vascular dementia coincide with those that increase risk for heart disease, stroke and other conditions affecting blood vessels, including high blood pressure, high cholesterol, diabetes, obesity and hardening of the arteries in the body. Many of these factors are also linked to increased risk for Alzheimer's.

People with prediabetes, whose blood sugar levels are higher than normal, may have an increased risk of cognitive decline and vascular dementia, according to a new study published in the February 11, 2021 study issue of *Diabetes, Obesity and Metabolism*. Researchers looked at data from the UK Biobank of 500,000 people aged 58 years on average and found that people with higher-than-normal blood sugar levels were 42% more likely to experience cognitive decline over an average of four years and were 54% more likely to develop vascular dementia over an average of eight years (although absolute rates of both cognitive decline and dementia were low).

Research reported at the 2019 Alzheimer's Association International Conference® suggests that adopting multiple healthy lifestyle choices, including healthy diet, not smoking, regular exercise and cognitive stimulation, may decrease the risk of cognitive decline and dementia. One study reported that participants who adopted four or five low-risk lifestyle factors had about 60% lower risk of Alzheimer's dementia compared with participants who did not follow any or only one of the low-risk factors. The following strategies may reduce the risk of developing diseases that affect the heart and blood vessels — and may help protect the brain:

- Don't smoke.
- Keep blood pressure, cholesterol and blood sugar within recommended limits.
- Eat a healthy, balanced diet.
- Exercise.
- Maintain a healthy weight.
- Limit alcohol consumption.

According to research reported at the Alzheimer's Association International Conference® 2022 (AAIC®), women with hypertensive disorders during pregnancy (HDP) are more likely to develop vascular dementia later in life, compared with women who had non-hypertensive pregnancies. The research also shows that preeclampsia and other types of HDP are linked to white matter damage (or damage to the brain's wiring system), a predictor of cognitive decline, and higher brain levels of beta-amyloid protein, an Alzheimer's-related brain change.

Outcomes

Like other types of dementia, vascular dementia shortens life span. Some data suggest that those who develop dementia following a stroke survive an average of three years. As with other stroke symptoms, cognitive changes may sometimes improve during recovery and rehabilitation from the acute phase of a stroke as the brain generates new blood vessels and brain cells outside the damaged region take on new roles.

Researchers have found that vascular dementia led to the highest risk of COVID-19 among those living with dementia, suggesting that damaged blood vessels might make it easier for disease-causing bacteria and viruses to cross from a person's blood into the brain. This study was published in the February 9, 2021 online issue of *Alzheimer's & Dementia*.

Treatment

The U.S. Food and Drug Administration (FDA) has not approved any drugs specifically to treat symptoms of vascular dementia, but there is evidence from clinical trials that drugs approved to treat Alzheimer's symptoms may also offer a modest benefit in people with vascular dementia. Pharmacological treatment primarily works to prevent the worsening of vascular dementia by treating the underlying disease, such as hypertension, hyperlipidemia or diabetes mellitus.

Controlling risk factors that may increase the likelihood of further damage to the brain's blood vessels is an important treatment strategy. There's substantial evidence that treatment of risk factors may improve outcomes and help postpone or prevent further decline.

Individuals should work with their physicians to develop the best treatment plan for their symptoms and circumstances.

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