

Vascular Dementia

What is vascular dementia?

Cerebrovascular disease is the progressive change in our blood vessels (vasculature) in the brain (cerebrum). The most common vascular change associated with age is the accumulation of cholesterol and other substances in the blood vessel walls. This results in the thickening and hardening of the walls, as well as narrowing of the vessels, which can result in a reduction or even a complete stopping of blood flow to brain regions supplied by the affected artery. When this occurs suddenly, the result is a stroke, with symptoms ranging from weakness to incoordination to abnormal sensations, depending on the location of the injury in the brain. In some cases, a sudden loss of cognitive function (such as language, memory, complex visual processing or organizational skills) can occur. Strokes are usually diagnosed easily with modern brain imaging techniques. The cognitive problems are usually worst at the time of the stroke and improve over time. Such cases are not usually diagnosed as dementia, but rather as residual cognitive impairment from a stroke.

The term **vascular dementia** (VaD) is usually reserved for a subtly progressive worsening of memory and other cognitive functions that is presumed to be due to vascular disease within the brain. VaD patients often present with similar symptoms to **Alzheimer's disease** [8] (AD) patients, however, the related changes in the brain are not due to AD pathology but to chronic reduced blood flow in the brain, eventually resulting in dementia. Clinically, such patients can look very similar to patients with AD, and when this occurs the two diseases are very difficult to distinguish from each other. However some clinical symptoms and brain imaging findings suggest that vascular disease is playing a role in, if not completely explaining, a patient's cognitive impairment.

As is the case with AD, the cognitive changes in VaD can remain quite mild for a substantial period of time. Patients with more advanced VaD experience severe disruption in their personal, social and vocational functioning. Early recognition of VaD is important because many of the risk factors leading to cerebrovascular disease can be managed medically. Proper management of some of these risk factors has been shown to reduce the risk of developing cognitive impairment.

VaD is considered one of the most common types of dementia in older adults, however, because it is difficult to diagnose definitively, many studies examining its prevalence may be incorrect. In the US and Western Europe, the ratio of VaD to AD is generally thought to be 1:5, and dementia following stroke is thought to occur in one quarter to one third of cases of stroke. The incidence of

dementia rises exponentially for patients with cerebrovascular risk factors such as hypertension, cardiac disease, diabetes, smoking, alcoholism and hyperlipidemia. Demographic factors such as male gender and African American ethnicity are also known risk factors. Age of onset is variable, though older adults are most at risk, secondary to increased cerebrovascular disease later in life.

In a diagnostic evaluation, a neurologist looks for signs of dementia (cognitive impairment severe enough to cause a significant deterioration in function), and if found, possible causes that can be treated or managed. The evaluation involves a thorough history to document the degree and types of cognitive difficulty and to evaluate vascular risk factors. A neurologic exam is done to look for signs of prior strokes (because a single stroke only affects a portion of the brain, these signs are called "focal" neurologic signs). High blood pressure is a strong risk factor for VaD and should be assessed and treated if high. At the minimum a brief neuropsychological evaluation of memory and other cognitive functions is warranted. Because depression and emotional behavior are often altered in this disease, questions regarding these symptoms are important. A family member or friend who can provide information as to the patient's degree of memory loss and functional impairment with respect to daily activities should accompany the patient.

Evaluation also includes a number of blood tests that are part of the routine evaluation of cognitive impairment, including tests of thyroid function, vitamin B12 levels and others, as necessary. In suspected vascular dementia, tests for diabetes and cholesterol levels should be included.

One of the most useful tests in the evaluation of VaD is magnetic resonance imaging (MRI). The MRI is very sensitive to changes in the brain caused by stroke. The principal findings in VaD are lacunar infarcts (small, spherical strokes in the deep parts of the brain) and abnormal findings in the cerebral white matter. This is the region where axons (the long part of a nerve cell) travel. It is called the "white matter" because the fatty insulation on the axons makes it look white in real life. These changes can be seen in many people who appear to have no cognitive complaints, however, studies have shown that as the total volume of these changes increases, cognitive difficulties are more likely.

The most difficult issue in the diagnosis of vascular dementia is its differentiation from AD. The cognitive and behavioral symptoms of AD and VaD look quite similar. The presence of complaints, neuropsychological abnormalities, exam findings or even imaging findings suggesting VaD cannot eliminate the possibility of AD. Autopsy studies have shown that many patients have both AD and VaD.

Signs & symptoms of vascular dementia

The major presenting complaint in patients with VaD is memory. Although the complaint is similar

to AD, memory difficulties in VaD may be more easily overcome with cues and reminders. Other symptoms frequently include difficulty with organization and solving complex problems, slowed thinking, distraction or "absent mindedness" and difficulty retrieving words from memory. Additionally, there may be changes in mood or behavior such as depression, irritability, or apathy. In some instances VaD patients may experience hallucinations or delusions that can be quite distressing to patients and caregivers.

Difficulties with balance and movement may be seen in VaD. Some of the features of [Parkinson's disease \(PD\)](#) [9] may occur, such as tremor and weakness on one or both sides of the body. Studies have shown that problems with walking and balance in the setting of dementia increase the likelihood of a vascular contribution. This can be one of the most useful clinical features, because problems with movement are not usually seen in AD until late in the course of the disease. Other diseases causing dementia, such as [progressive supranuclear palsy \(PSP\)](#) [10] and [corticobasal degeneration \(CBD\)](#) [11], are also associated with movement problems.

Progression of vascular dementia

VaD may progress in a "stepwise" fashion such that initial cognitive deficits (e.g., memory difficulty) plateau for a period of time followed by the sudden onset of more cognitive deficits. However, more commonly, initial cognitive deficits present subtly and progress slowly over time.

Treatment of vascular dementia

Currently, there is no treatment that can repair the effects of vascular dementia. Treatment approaches are aimed at preventing future vascular insults by controlling major risk factors. High blood pressure and elevated cholesterol can be effectively treated with a combination of medicine, regular exercise, healthy diet and stress reduction. There is substantial evidence that treatment of these conditions reduces the risk of developing dementia. Risk of further vascular incidents is decreased when diabetes is well controlled. Reducing or eliminating smoking and/or reducing alcohol intake may also be effective prevention of VaD. Studies are ongoing to investigate whether medications for AD, such as cholinesterase inhibitors, are effective in VaD.

Antidepressants can be prescribed for depression and/or generalized anxiety.

Resources for vascular dementia

Caring for a loved one affected by vascular disease can be challenging. Caregivers may experience worry, guilt, isolation or a number of other unpleasant feelings and should seek support in dealing with such difficulties.

- [American Stroke Association](#) [12]
- [American Heart Association](#) [13]
- [Family Caregiver Alliance](#) [14]
- [National Institute of Neurological Disorders and Stroke \(NINDS\)](#) [15]

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UCSF Memory and Aging Center
Sandler Neurosciences Center
675 Nelson Rising Lane, Suite 190
San Francisco, California
(415) 353-2057 clinic appointments
(415) 476-0670 research inquiries

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