

Short Review

Vascular Dementia: When Cerebrovascular Injury Reshapes Memory, Thinking, and Daily Life

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Citation: Brigadski F, Vascular Dementia: When Cerebrovascular Injury Reshapes Memory, Thinking, and Daily Life V2 (2),2026

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Received date: April 28, 2026: **Accepted date:** May 13, 2026: **Published date:** May 29,2026

Keywords: vascular dementia, cerebrovascular disease, cognitive impairment, stroke, small-vessel disease, vascular risk factors, dementia prevention

Abstract

Vascular dementia is a progressive cognitive disorder caused by cerebrovascular disease that disrupts the brain's ability to receive and utilize an adequate blood supply. Unlike dementias that primarily arise from neurodegenerative processes, vascular dementia reflects the cumulative consequences of strokes, small-vessel disease, and other vascular injuries affecting brain tissue. Its clinical presentation can vary considerably depending on the location, number, and severity of vascular lesions. Problems with executive functioning, attention, processing speed, planning, and organization are often prominent, while memory impairment may develop alongside these deficits. Vascular risk factors including hypertension, diabetes mellitus, dyslipidemia, smoking, obesity, atrial fibrillation, and previous stroke—play an important role in disease development and progression. Early recognition is particularly important because several vascular risk factors are potentially modifiable. Diagnosis generally involves a combination of clinical assessment, cognitive evaluation, neurological examination, and brain imaging. Although existing vascular brain injury cannot usually be reversed, appropriate management of vascular risk factors, stroke prevention, rehabilitation, physical activity, and treatment of associated conditions may help reduce further cognitive and functional decline. This article reviews the underlying mechanisms, risk factors, clinical manifestations, diagnosis, management, prevention, and emerging perspectives surrounding vascular dementia.

Introduction

Dementia is a syndrome characterized by acquired decline in cognitive abilities that interferes with an individual's independence and everyday activities. Vascular dementia is one of the major forms of

dementia and occurs when cerebrovascular disease damages areas of the brain responsible for cognition and behavior.

The condition may develop after a major stroke or gradually as repeated small vascular injuries accumulate over time. Some individuals experience noticeable cognitive deterioration following a stroke, whereas others develop a slowly progressive pattern associated with chronic small-vessel disease.

Vascular dementia is particularly important from a public-health perspective because many of its major risk factors are associated with cardiovascular and cerebrovascular disease. Prevention and early management of these factors may therefore have an important role in reducing the risk of cognitive decline.

Understanding the Vascular Basis of Dementia

The brain requires a continuous supply of oxygen and nutrients through its extensive network of blood vessels. When cerebral blood flow is interrupted or reduced, brain cells can become injured or die.

Several vascular mechanisms can contribute to cognitive impairment, including:

- Large-vessel strokes
- Multiple small infarcts
- Lacunar infarctions
- Cerebral small-vessel disease
- Chronic damage to white matter
- Cerebral microbleeds

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- Strategic infarcts affecting critical cognitive regions
- Long-term reduction in cerebral perfusion

The resulting neurological damage may interfere with communication between different brain regions. When these disruptions become sufficiently extensive, cognitive and functional impairment may develop.

Clinical Manifestations

The symptoms of vascular dementia depend largely on the brain regions affected and the underlying vascular disease

Common manifestations include:

- Reduced attention and concentration
- Slowed information processing
- Difficulty planning and organizing
- Impaired judgment
- Problems with problem-solving
- Difficulty performing complex tasks
- Memory impairment
- Language difficulties in some patients

Executive dysfunction may be particularly prominent. A person may know what needs to be done but struggle to organize the steps necessary to complete the task.

Relationship Between Stroke and Vascular Dementia

Stroke is an important contributor to vascular cognitive impairment. A major stroke can directly damage brain regions involved in cognition, while repeated smaller strokes can gradually reduce overall brain function. Some individuals develop cognitive impairment soon after a stroke. In other cases, cognitive problems become apparent months or years later as additional vascular injuries accumulate.

The relationship between stroke and dementia is therefore not limited to a single event. Rather, vascular dementia may represent the long-term cognitive consequences of repeated or progressive cerebrovascular injury.

Conclusion

Vascular dementia represents an important intersection between cerebrovascular health and cognitive function. It can arise from major strokes, repeated small infarctions, small-vessel disease, and other forms of vascular brain injury. Its symptoms commonly involve executive dysfunction, slowed processing, attention problems, memory impairment, and changes in physical or emotional functioning.

Although established brain injury cannot generally be reversed, early identification and management of vascular risk factors can play an important role in preventing additional cerebrovascular damage. A combination of medical management, stroke prevention, rehabilitation, healthy lifestyle practices, and caregiver support provides a comprehensive approach to care

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DOI:10/JNDD/2026/021

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