



DEPARTMENT OF
NEUROLOGY

Parkinson's Disease Center and Movement Disorders Clinic

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Vascular (multi-infarct) Parkinsonism

Diagnosis

There are many causes of parkinsonism. Vascular (also referred to as "multi-infarct") parkinsonism is a form of "atypical parkinsonism" in which parkinsonian symptoms (slow movements, tremor, difficulty with walking and balance, stiffness and rigidity) are produced by one or more small strokes, rather than by gradual loss of nerve cells as seen in the more typical neurodegenerative Parkinson's disease.

Patients with vascular parkinsonism might have the same symptoms as those with idiopathic Parkinson's disease, although it often involves the lower more than the upper part of the body as well as the other characteristic findings as described above. There may also be additional residual signs and symptoms from previous strokes such as (often asymmetric) limb weakness, numbness, abnormal reflexes or abnormal speech. Computerized tomography (CT) or magnetic resonance imaging (MRI) of the brain are likely to be abnormal in 90-100 percent of cases of vascular parkinsonism, often showing multiple small strokes in the deep portions of the brain. If a patient has never had evaluation of his or her stroke risk factors before, such work up will be needed. This might include additional blood tests, evaluation for possible heart disease and narrowing of the blood vessels of the head or neck.

Cause

By definition, a stroke is the loss of a discrete brain area (lesion) because of blockage of a blood vessel supplying blood to that brain region. The blockage of the blood vessel is usually caused by either:

- Thickening of the vessel wall due to uncontrolled high blood pressure (a process known as "lipohyalinosis") or
- Build-up of fatty material in the walls of an artery (a process known as "atherosclerosis" or hardening of the arteries) or
- Sudden lodging in the blood vessel of a clot which broke off from the inner lining of another blood vessel or from the heart (a process known as "embolization").

Stroke or "brain attack" is similar to heart attack; both are caused by a blocked blood vessel. When one or more strokes occur in the basal ganglia of one side of the brain, the patient can develop symptoms of parkinsonism on the opposite side of the body. If there are strokes affecting the basal ganglia on both sides of the brain, the patient can develop parkinsonism on both sides of the body.

Because strokes in general happen suddenly, the onset of parkinsonian symptoms in a patient with vascular parkinsonism can also come on suddenly. Patients may have had several strokes in the past, each one coming on suddenly and producing specific deficits related to the location of the stroke in the brain. Most of these strokes will not produce parkinsonism; however, when the strokes affect the basal ganglia, parkinsonism can result. On the other hand, most patients with vascular or multi-infarct parkinsonism are not aware of the individual strokes. Because each stroke affect only a small area of the brain, the symptoms may progress gradually, rather than stepwise, and may resemble the progression of typical Parkinson's disease, occasionally leading to misdiagnosis. In addition to stroke risk factors (see further description under "Treatments") such as diabetes, high blood pressure, and heart disease, the diagnosis is suggested by predominant involvement of the legs ("lower-body parkinsonism") with gait and balance problems, lack of tremor, poor response to levodopa (as opposed to Parkinson's disease), and CT or MRI brain scans showing multiple minute or more extensive strokes. Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL), the most common heritable (but still very rare) cause of stroke and vascular dementia in adults, may also cause vascular parkinsonism.

Treatment

Vascular parkinsonism does not respond well to the typical medications used to treat Parkinson's disease. The treatment of vascular parkinsonism focuses on trying to lower the chance of having additional strokes in the future by attempting to control "stroke risk factors." These "stroke risk factors" are essentially the same ones which are associated with increased risk of heart attack. They include smoking, high blood pressure, diabetes mellitus, high cholesterol, obesity, a sedentary (no-exercise) lifestyle, and genetic predisposition to atherosclerosis. Stopping smoking, eating a low fat-low salt diet, and getting adequate exercise on a regular basis are examples of lifestyle changes which can be made to reduce the risk of repeat strokes. Such risk factor medication in essence help modify the natural course of the disorder, as prevention of further strokes prevents further worsening of already established parkinsonism. In general, taking an aspirin a day (if recommended by your doctor) is a good way to thin the blood and decrease the risk of having a stroke or heart attack. Other than the above measures aimed at prevention, treatment of symptomatic vascular parkinsonism involves a trial of levodopa and other anti-parkinsonian medications. Unfortunately, such anti-parkinsonian medication is rarely effective for vascular parkinsonism. Physical and occupational therapy may also play an important role in preventing complications such as falling, through training to improve balance and steadiness, use of appropriate ambulatory devices and development of compensatory strategies.

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