Ischemic Stroke

In an ischemic stroke, the blood supply to part of the brain is cut off. This happens because of atherosclerosis in a blood vessel feeding part of the brain or a blood clot has blocked a blood vessel. Blood clots can also travel to the brain from another artery or from the heart.

Symptoms

Most strokes happen suddenly and damage the brain within minutes. In rarer cases, a stroke may get worse for several hours to a day or two as a steadily enlarging area of the brain dies (stroke in evolution). In this case, the stroke is usually (although not always) interrupted by stable periods when the area temporarily stops getting bigger or some improvement occurs.

The common symptoms of stroke include:

- Loss of (or abnormal) sensations in an arm, leg or one side of the body
- Weakness or paralysis of an arm or leg or one side of the body
- Partial loss of vision or hearing
- Double vision
- Dizziness
- Slurred speech
- Problems thinking of or saying the right word
- Inability to recognize parts of the body
- Imbalance and falling

Causes and Risk Factors

This type of stroke can be caused by a blockage anywhere along the arteries feeding the brain. The blockages can occur for many reasons, including:

- The build up of fatty material (atheroma) along artery walls that cuts down blood flow
- Breaking off of an atheroma from the artery wall. It can flow with the blood getting stuck in a smaller artery causing a blockage.
- Blood clots that break loose from the heart or one of its valves, known as an emboli. They can go through the arteries to the brain, where they lodge causing an embolic stroke or cerebral embolism. This is most common in people who have recently had heart surgery or who have defective heart valves or abnormal heart rhythms.
- Blood clots that may break loose from a ruptured aneurysm in the brain or from bleeding
- Inflammation or an infection that narrows blood vessel that leads to the brain
- Drugs such as cocaine and amphetamines, which can narrow blood vessels
- Sudden drop in blood pressure. Although a sudden drop in blood pressure usually causes a person to faint, it can lead to a stroke if it is severe and lasts a long time. This happens when someone loses a lot of blood from an injury or surgery, has a heart attack or has an abnormal heart rate or rhythm.

Strokes may also cause swelling in the brain. The resulting pressure can damage brain tissue more, making neurologic problems worse even if the stroke itself doesn't enlarge.

Diagnosis

A doctor can often know that a stroke occurred based on a detailed history of events plus a physical examination. The diagnosis can be confirmed with tests including computer tomography (CT) scanning and magnetic resonance imaging (MRI). Newer MRI scans can show a stroke within minutes of symptoms (and at times, even before symptoms start). Once the doctor is sure the patient has had an ischemic stroke, it is important to identify the type of stroke and what caused it.

Treatments

A person who shows signs of a stroke should get medical treatment right away. The faster treatment can be done, the less risk there is of permanent damage to the brain.

Quick action by a doctor can sometimes reduce the damage or prevent more damage. Many effects of a stroke require medical care such as oxygen or an intravenous line to provide the patient with fluids and nourishment.

If a stroke is still in the process of happening, drugs to prevent blood clotting such as a heparin may be given. If the stroke has already happened these drugs are not effective.

If the stroke is caused by a blood clot, two options to treating a stroke may be used - either together or alone:

- The use of clot dissolving drugs such as tissue plasminogen activator (tPA) or streptokinase. This is best done within about three hours of the start of stroke symptoms.
- The use of a clot removal device such as the Penumbra Stroke System. This system can be used up to eight hours after the start of symptoms.

An examination must be done quickly to rule out the possibility of a hemorrhage, which can't be treated with clot-dissolving drugs.

Removing blood vessel blockages after a small stroke or transient ischemic attack may reduce the risk of future strokes. In this case, carotid artery stenting or treating aneurysms or arteriovenous malformations may be recommended.

To reduce swelling and pressure on the brain in people with an acute stroke, drugs such as mannitol, or rarely, corticosteroids may be given.

While dead brain tissue cannot be restored, intensive rehabilitation can help many people overcome disability by training other parts of the brain to do what the damaged part originally did. Rehabilitation usually begins quickly to keep the patient's muscles strong, to prevent muscular contractions and pressure sores and to teach the patient to walk and talk again. Rehabilitation may continue after a patient leaves the hospital.

A stroke's impact varies widely, depending on how severe it was and what parts of the brain it affected. Many people recover all or most of their ability to function in daily life after a stroke. Others can be left unable to move, speak or eat normally.

Strokes that cause unconsciousness or impair breathing or heart function are particularly serious. Functioning problems that continue after six months are most likely to be permanent, although some people continue to improve slowly. People who are younger and in better general health tend to recover faster and more completely.