

Stroke Symptoms Information Guide



INDIAN ACADEMY OF
NEUROLOGY

A Public Information Initiative

What is a stroke?

- Stroke or 'brain attack' results from a sudden block or rupture of one of the arteries supplying blood to the brain.
- Stroke is a medical emergency.
- Time is the essence, as for every minute of delay in obtaining the treatment, twenty lakh brain cells are irreversibly lost.
- With passing of each hour of untreated stroke, brain ages by 3.6 years.
- Remember, 'TIME IS BRAIN'.

Social impact of stroke

- Stroke is a leading cause of death and disability in the world.
- It is the second most common cause of death and is the leading cause of disability among adults worldwide.
- About 20 to 25% of patients succumb to stroke and 15 to 30% of survivors are permanently disabled.
- Either this phrase may be omitted or modified to 'Stroke produces a heavy burden on patient's family and care givers'
- Developing countries account for 85% of global deaths from stroke.

Stroke statistics in India

- Approximately, 15 lakh people are struck with stroke every year in India.
- Prevalence is 55.6 per 100,000 across all age groups.
- 6.3 lakh deaths occur every year due to stroke.
- 12% of strokes occur in the population aged <40 years.

Understanding the basics: Basic anatomy of circulation of brain

- Brain is one of the highly vascular organs of the body.
- It has two interconnected hemispheres – right and left.
- Human brain is supplied by four large arteries – the internal carotid arteries and the vertebral arteries on both sides.
- These arteries arise from the main branches of aorta, course up the neck and then divide further into smaller branches which supply different parts of the brain.
- The major branches within the brain are the middle cerebral arteries, anterior cerebral arteries, basilar artery and posterior cerebral arteries.
- There is cross-communication between these arteries on both sides of the brain.

Types of stroke

- Stroke is mainly of two types – ischemic stroke and hemorrhagic stroke.
- About 80% of all strokes are ischemic.
- By saying 'stroke', we usually refer to ischemic stroke.
- The hemorrhagic strokes are commonly called 'bleeds'.

What is ischemic stroke?

Ischemic stroke occurs due to a blood clot blocking one of the major arteries or their branches. This leads to

death of the area of the brain which is supplied by the artery and development of symptoms related to the specific site deprived of blood flow.

The occlusion can result from a clot that has been growing slowly at the site of the block called a thrombotic stroke. More commonly, a clot migrates to the small arteries of brain from a larger artery or from the heart which produces an embolic stroke. In rare cases, the block to blood supply can result from a tear of the arteries or conditions which result in tendency of blood to clot easily or rare inherited diseases. Within the brain, there is enough cross-talk between the arteries to enable some compensation from other vessels if one of them gets slowly occluded. However, if the block occurs rapidly (over minutes to hours) or if many arteries are diseased, this compensation may not be adequate to prevent the symptoms.

How to identify a stroke?

A relatively sudden onset of symptoms like weakness, speaking difficulty, facial deviation, imbalance or sensory disturbances in any person should alert the individual or the family members that it might be a stroke.

Remember to act 'FAST'

'FAST' is a useful acronym which can help to detect stroke early and ensure that the victim receives medical care at the earliest.

The 'FAST' acronym stands for:

Facial drooping: One side of the face droops and deviates to a side
Arm weakness: Inability to raise one arm fully
Speech difficulties: Difficulty in understanding or producing speech
Time: Time is the essence, call emergency services (108) immediately

What is thrombolysis or 'clot-busting' therapy in stroke?

The only definitive therapy known to reverse the symptoms of stroke is thrombolysis. It involves administering a medicine 'recombinant tissue plasminogen activator' (rtPA) either intravenously or intra-arterially to dissolve the clot blocking the artery. Giving this medicine is useful only during the short period of time immediately after the stroke known as the 'window period', before the part of the brain supplied by the blocked artery is completely dead. It is most effective when given within three hours after the onset of symptoms and in some instances within four-and-a-half hours of symptom onset. It prevents further damage in the brain by restoring the blood flow. However, the area which is already completely dead cannot be salvaged.

The decision to give rtPA should be made based on the individual patient and the type of stroke, as there exist many circumstances when this drug is unsafe. Depending on the stage and type of stroke, rtPA can be given as an intravenous drip or into the artery by an angiography procedure. In some cases, the clot can also be removed using a wire and stenting device.

What treatment is possible if the patient reaches outside the 'window period'?

A patient who reaches outside the window period, i.e., when the clot-busting therapy is no longer useful, still needs evaluation and observation. Such patients have a risk of worsening of the weakness and of development of swelling of the brain, which can be life-threatening.

The therapy will depend on the cause of the stroke. In general, ischemic stroke patient needs to be judiciously treated with drugs like aspirin which prevent clotting of blood, and further measures to control blood sugar,

maintain good hydration and prevent complications. Drugs like aspirin may need to be continued lifelong. In addition, regular exercise, control of cholesterol levels, treatment of hypertension, quitting smoking etc. are also required.

The purpose of intensive medical therapy of stroke is to avoid extension of the current damage and to prevent a second stroke.

Early physiotherapy is the cornerstone for recovery from a stroke. As soon as the patient is deemed fit, he/she should be started on physiotherapy and gait therapy. Additional speech therapy is needed in patients with significant speaking difficulty.

The rehabilitation measures are ideally done in a comprehensive stroke care unit.

Is there any surgery for stroke?

No surgery can cure a stroke once it happens. However, surgeries like carotid endarterectomy are done to remove clots from larger arteries which have the potential to cause recurrent strokes. Surgery may, sometimes, be advised in the acute phase of stroke to relieve brain swelling.

Transient ischemic attack (TIA)

Transient ischemic attacks are ischemic strokes of very short duration (deficits should improve completely within 24 hours). Patients with TIA have a high likelihood of developing a full-fledged stroke in the next two weeks. The most important cause for TIA is a clot lodging in one of the main arteries that breaks off and produces small blocks distally. TIA is a warning symptom for a stroke and should also be treated promptly.

Hemorrhagic strokes or 'bleeds'

Hemorrhagic stroke is due to rupture of a weakened blood vessel of the brain. The symptoms arise because the accumulated blood leads to increased pressure and compresses the surrounding brain tissue.

The bleeds can occur into the substance of the brain called intracerebral bleeds or outside the brain called subarachnoid, subdural or extradural bleeds.

Who can get a stroke?

Stroke can occur at any age and to anyone. However, it is much more common in the elderly (over 65 years of age) and in patients with risk factors like diabetes mellitus, hypertension, high cholesterol, heart disease, and positive family history of stroke or heart disease.

About 90% of the strokes occur in patients with one of the risk factors.

The major risk factors for stroke are:

- *Older age*: Individuals over the age of 65 years have the highest risk of developing a stroke.
- *Hypertension*: High blood pressure is the most important risk factor for both ischemic and hemorrhagic strokes, increasing the odds of developing a stroke by two to four times even in younger individuals. Higher the blood pressure, higher the risk of developing a stroke. Control of hypertension by antihypertensive medications and life-style modifications can reduce the risk of stroke by 30 percent.
- *Altered cholesterol levels*: High LDL cholesterol (bad cholesterol) and low HDL cholesterol (good

cholesterol) are associated with higher risk of stroke.

- *Diabetes mellitus*: Diabetes mellitus is associated with an increased tendency for changes in the arterial wall called atherosclerosis and is an acknowledged risk factor for both strokes and heart attacks. It alters the ability of the body to handle metabolism and also increases the risk of hypertension. In addition, high blood glucose at the time of stroke is associated with a larger extent of damage, poor recovery and adverse effects during thrombolysis. Control of hypertension and other risk factors should be stringent in a patient with diabetes to prevent stroke.
- *Smoking*: Smoking is associated with strokes, especially in younger people. The risk of ischemic stroke and subarachnoid haemorrhage is increased with smoking.
- *Heart disease*: The presence of certain heart problems like atrial fibrillation, valvular heart disease, artificial heart valves, heart failure and dilated and poorly functioning heart can predispose a person to stroke. These patients need to be evaluated and started on drugs which can prevent clotting of blood.
- *Obesity and physical inactivity*: Increase in body weight measured as high body mass index and high abdominal circumference are factors predisposing to vascular diseases as well as hypertension, diabetes and dyslipidemia. Studies have shown that physically active men and women generally have a 25% to 30% lower risk of stroke or death than the least active people.
- *Family history*: Blood relatives of persons with history of stroke or heart attack at a young age are at a higher risk of developing events themselves. Some rare familial disorders like Fabry's disease, CADASIL, Ehler's Danlos syndrome, and fibromuscular dysplasia can also predispose to stroke.
- *Rare predispositions*: Some rare conditions known to increase risk of a stroke include hormone therapy in females, excessive alcohol consumption, migraine, hypercoagulable states, and obstructive sleep apnea.

Prevention of stroke

Stroke and disability due to stroke can be prevented to a great extent through:

- Modification of risk factors for stroke
- Early identification of stroke and hospitalization

Management of risk factors

Screening for risk factors

Regular screening for high blood pressure is recommended after 18 years of age and this should be done once in 2 years or more frequently if values above 120 mm Hg of systolic blood pressure and 80 mm of diastolic blood pressure are recorded. A blood pressure more than 140 mm Hg systolic and/or 90 mm Hg diastolic warrants drug therapy.

Fasting serum lipid profile should be measured according to patient's risk for hyperlipidemia at least every 5 years and if risk factors are present, every 2 years, after 20 years of age.

Testing to detect diabetes in asymptomatic people should be done by measuring fasting blood glucose after 45 years of age and in adults of any age who are overweight or obese and who have one or more additional risk factors for diabetes like family history, prediabetes, and history of diabetes in pregnancy, history of heart

disease etc.

Body mass index, waist circumference, and pulse (to screen for atrial fibrillation) should be recorded at least every 2 years.

Patients in whom any of the risk factors are identified should adopt a healthier lifestyle and start treatment for normalization of the parameters. In people with diabetes, strict control of hypertension with appropriate drugs reduces the risk of stroke.

Lifestyle modifications

Along with regular medicines, there are a number of life-style changes that you can make to help lower your BP and your risk of stroke.

- Have your BP checked regularly.
- Keep your weight within a healthy range for your age and gender.
- Being overweight can increase your BP, raise your cholesterol level, and increase the risk of developing diabetes.
- Try to get at least 30 minutes of light-to-moderate exercise for 5-6 days a week.
- Quit smoking.
- Cut down on alcohol.
- Eat healthy. Seek advice from a dietician. A diet rich in fruits, vegetables, whole grains, low-fat dairy, fish, poultry and vegetable oils, but limited in sodium and saturated fats is recommended.
- Maintain an active lifestyle.

Disclaimer:

This brochure is for the general information of the public and the patients. People should not self-medicate themselves with the medicines and treatments mentioned here. Before taking any of the medications mentioned in the information brochure, please consult your neurologist.

Dr. Abraham Kuruvilla, MD

Dr Sruthi S Nair, MD, DM



**INDIAN ACADEMY OF
NEUROLOGY**