

STROKE



Centurion
UNIVERSITY

Shaping Lives...
Empowering Communities...

By

Ms. RUPALI RUPASMITA ROUT
ASSISTANT PROFESSOR

INTRODUCTION:

A stroke occurs when there is a disruption of blood flow to the brain, leading to the death of brain cells.

TYPES:

- The most common type of stroke is called an ischemic stroke, which occurs when a blood vessel supplying the brain becomes blocked or narrowed, often due to a blood clot.
- Another type is a hemorrhagic stroke, which happens when a blood vessel in the brain ruptures or leaks.

ETIOLOGY/CAUSES:

Ischemic Stroke: The common causes of ischemic stroke include:

- Atherosclerosis: The buildup of fatty deposits (plaques) in the arteries, narrowing them over time.
- Cardioembolism: When a blood clot or debris forms in the heart and travels to the brain, causing a blockage.
- Small vessel disease: The narrowing and damage of small blood vessels in the brain.

Hemorrhagic Stroke: The common causes of hemorrhagic stroke include:

- High blood pressure (hypertension): The most significant risk factor for hemorrhagic stroke, as it weakens blood vessel walls.
- Aneurysms: Weak areas in blood vessel walls that can rupture and cause bleeding.
- Arteriovenous malformations (AVMs): Abnormal tangles of blood vessels that can rupture.

Drug use: Certain drugs, such as cocaine, can increase the risk of stroke.

Transient Ischemic Attack (TIA): Often referred to as a "mini-stroke," a TIA is caused by a temporary disruption of blood flow to the brain. It typically resolves

within a few minutes to hours and may not cause permanent damage. TIAs are often warning signs of an impending stroke and should not be ignored.

Other risk factors that increase the likelihood of having a stroke include:

- **Age:** The risk of stroke increases with age, particularly after 55.
- **Gender:** Men have a slightly higher risk of stroke, but more women die from strokes.
- **Family history:** Having a close family member who has had a stroke increases the risk.
- **Race and ethnicity:** Some ethnicities, such as African Americans, have a higher risk.
- **Medical conditions:** High blood pressure, diabetes, high cholesterol, atrial fibrillation, and other cardiovascular diseases increase the risk.
- **Lifestyle factors:** Unhealthy habits like smoking, excessive alcohol consumption, poor diet, physical inactivity, and obesity can increase the risk of stroke.

PATHOPHYSIOLOGY:

- Stroke can be caused by either a blockage or rupture of a blood vessel in the brain.
- When blood flow is reduced or blocked, brain cells in the affected area are deprived of oxygen and nutrients. This lack of oxygen, known as ischemia, triggers a cascade of events that damage brain cells.
- If ischemia persists, brain cells release excessive amounts of certain chemicals, including glutamate. This excess glutamate overstimulates nearby cells, causing them to become overexcited and damaged.
- It also release chemicals that trigger an inflammatory response, leading to swelling and the release of more harmful substances that can further damage brain tissue.
- Prolonged ischemia and the resulting cellular damage lead to the death of brain cells in the affected area. The extent of cell death determines the severity of the stroke and the resulting symptoms.

CLINICAL MANIFESTATION:

- **Face drooping:** One side of the face may droop or feel numb. Ask the person to smile, and see if one side of their smile is uneven or drooping.
- **Arm weakness:** One arm may become weak or numb. Ask the person to raise both arms, and see if one arm drifts downward or cannot be held up.
- **Speech difficulty:** Speech may be slurred, and the person may have trouble understanding or finding words. Ask the person to repeat a simple sentence, and check if they have difficulty speaking clearly.

Others like

- Sudden severe headache with no known cause.
- Sudden trouble with vision, such as blurred or double vision.
- Sudden dizziness, loss of balance, or coordination difficulties.
- Sudden confusion, trouble understanding, or trouble speaking.
- Sudden numbness or weakness, especially on one side of the body, including the face, arm, or leg.

DIAGNOSIS:

- **Family history & Medical history**

Physical Examination: A healthcare professional will assess the person's symptoms and risk factors. They will also perform a physical examination to evaluate neurological function, such as muscle strength, reflexes, coordination, and sensory perception.

Imaging Tests: Computed Tomography (CT) Scan: This imaging test can help determine if a stroke is caused by bleeding (hemorrhagic stroke) or a blockage (ischemic stroke). It provides detailed images of the brain, allowing healthcare professionals to visualize any bleeding, tumors, or abnormalities.

Magnetic Resonance Imaging (MRI): An MRI scan provides more detailed images of the brain than a CT scan. It can help identify the location and extent of the stroke, as well as any other underlying conditions that may have contributed to the stroke.

Blood Tests: Blood tests are performed to evaluate various factors, including blood clotting, cholesterol levels, blood sugar levels, and kidney function. These tests can help identify potential risk factors and causes of the stroke.

Electrocardiogram (ECG): An ECG is used to check for irregular heart rhythms, such as atrial fibrillation, which can increase the risk of stroke.

Doppler Ultrasound: This non-invasive test uses sound waves to assess blood flow through blood vessels. It can help identify any blockages or abnormalities in the arteries that supply blood to the brain.

Cerebral Angiogram: In some cases, a cerebral angiogram may be performed to obtain detailed images of the blood vessels in the brain. It involves injecting a contrast dye and taking X-ray images to identify any blockages or abnormalities.

PHARMACOLOGICAL MANAGERMENTS:

chemic Stroke Treatment:

Tissue Plasminogen Activator (tPA): tPA is a thrombolytic medication that can be administered within a specific time window after the onset of an ischemic stroke. It works by dissolving the blood clot causing the blockage and restoring blood flow to the brain. **Alteplase (Activase)** is an example of a commonly used tPA medication.

Antiplatelet Drugs: Antiplatelet medications help prevent blood clot formation and reduce the risk of recurrent strokes. **Aspirin** is one of the most commonly used antiplatelet drugs for stroke prevention.

Anticoagulants: Anticoagulant medications, such as warfarin or direct oral anticoagulants (DOACs) like **apixaban, dabigatran, or rivaroxaban**, are used to prevent blood clots in certain cases, such as atrial fibrillation, which can increase the risk of stroke.

Hemorrhagic Stroke Treatment:

Blood Pressure Medications: Controlling high blood pressure is crucial in managing hemorrhagic strokes. Medications like **calcium channel blockers (e.g., nimodipine)** or **angiotensin receptor blockers (e.g., losartan)** may be used to lower blood pressure and reduce the risk of further bleeding.

Surgical Interventions: In some cases of hemorrhagic stroke, surgery may be necessary to repair or remove the cause of bleeding, such as aneurysms or arteriovenous malformations (AVMs).

NON PHARMACOLOGICAL MANAGERMENTS:

- **Manage High Blood Pressure:** High blood pressure (hypertension) is a significant risk factor for stroke. Monitor your blood pressure regularly and work with your healthcare provider to keep it within a healthy range through lifestyle changes, medication, or a combination of both.
- **Control Diabetes:** If you have diabetes, it's important to manage your blood sugar levels effectively through a healthy diet, regular exercise, and medications as prescribed. Uncontrolled diabetes increases the risk of stroke.
- **Maintain a Healthy Diet:** Follow a balanced diet rich in fruits, vegetables, whole grains, lean proteins, and healthy fats. Limit your intake of saturated and trans fats, cholesterol, sodium, and added sugars. This can help control blood pressure, cholesterol levels, and weight.
- **Engage in Regular Physical Activity:** Aim for at least 150 minutes of moderate-intensity aerobic exercise, such as brisk walking, cycling, or swimming, each week. Regular physical activity helps maintain a healthy weight, control blood pressure, and reduce the risk of stroke.

- **Quit Smoking:** Smoking damages blood vessels and significantly increases the risk of stroke. Quitting smoking is one of the most important steps you can take to improve your overall health and reduce the risk of stroke.
- **Limit Alcohol Consumption:** Excessive alcohol consumption can raise blood pressure and contribute to other risk factors for stroke. If you choose to drink alcohol, do so in moderation—up to one drink per day for women and up to two drinks per day for men.
- **Manage Atrial Fibrillation:** Atrial fibrillation (an irregular heart rhythm) increases the risk of blood clots that can lead to stroke. If you have atrial fibrillation, work with your healthcare provider to manage it effectively through medications and other appropriate treatments.
- **Maintain a Healthy Weight:** Obesity and excess weight are associated with an increased risk of stroke. Adopt a healthy eating plan and engage in regular physical activity to achieve and maintain a healthy weight.
- **Control Cholesterol Levels:** High levels of cholesterol can contribute to the development of plaque buildup in the arteries, increasing the risk of stroke. Adopt a heart-healthy diet and, if needed, take medications as prescribed to control cholesterol levels.
- **Get Regular Check-ups:** Regular medical check-ups allow for the monitoring of risk factors and early detection of any underlying conditions that may increase the risk of stroke. Follow your healthcare provider's recommendations for screenings, tests, and preventive measures.