A REVIEW ON STROKE PREVENTION AND MANAGEMENT THROUGH LIFE STYLE MODIFICATIONS

A. Bharath Kumar*1, S. P. Zakiullah2, M. Anil3 and M. Manasarekha4

1Assistant Professor. Department of Pharmacy Practice. Annamacharya College of Pharmacy.  
2,3,4Pharm. D. Annamacharya College of Pharmacy. Rajampet. A. P. India.

ABSTRACT

Stroke is known as cerebrovascular accident (CVA), cerebrovascular insult (CVI), or brain attack, is when poor blood flow to the brain results in cell death. Stroke is a leading symptom with 20% of its survivors requires hospitalized care and up to 30% of them being severely and permanently disabled. it is a medical emergency. it happen when blood flow to brain obstructed Within minutes, brain cells begin to die. Ischemic stroke is caused by a blood clot that blocks or plugs a blood vessel in the brain. In India more than 1.6 million people having stroke per year. the symptom includes face drooling, speech slurring, arms weakness. The Review summaries the following standard guidelines and recommending patients for exercise therapy and highlighting further research and investigation would be helpful for effective prevention and rehabilitation in stroke patients in the community. The American Heart Association (AHA) recommends that stroke can be prevented through life style modifications and strengthening the activities of stroke patients towards exercise, physiotherapy, medication adherence. we can assure the independence in activities of daily living in stroke patients.

KEYWORDS: brain, blood, ischemia, face drooling.

INTRODUCTION

Stroke is defined by the World Health Organization as ‘a clinical syndrome consisting of rapidly developing clinical signs of focal (or global in case of coma) disturbance of cerebral function lasting more than 24 hours or leading to death with no apparent cause other than a vascular origin.’ A transient ischaemic attack (TIA) is defined as stroke symptoms and signs that resolve within 24 hours. There are limitations to these definitions. [1] The symptoms of a
TIA usually resolve within minutes or a few hours at most and anyone with continuing neurological signs when first assessed should be assumed to have had a stroke. Stroke is the third leading cause of mortality in the United States. approximately 700,000 strokes occurring each year, about 550,000 are first strokes. A stroke occurs when the blood supply to part of the brain is suddenly interrupted or when a blood vessel in the brain bursts, spilling blood into the spaces surrounding brain cells.[2] In the same way that a person suffering a loss of blood flow to the heart is said to be having a heart attack, a person with a loss of blood flow to the brain or sudden bleeding in the brain can be said to be having a "brain attack. "Ischemia ultimately leads to infarction, the death of brain cells occurs. When blood flow to the brain is interrupted, some brain cells die immediately, while others remain at risk for death.

**Ischemic stroke**

It happens when an artery supplying the brain with blood becomes blocked, suddenly decreasing or stopping blood flow and ultimately causing a brain infarction. Blood clots are the most common cause of artery blockage and brain infarction. The process of clotting is necessary and beneficial throughout the body because it stops bleeding and allows repair of damaged areas of arteries or veins.

**Hemorrhagic Stroke**

When an artery in the brain bursts, blood spews out into the surrounding tissue and upsets not only the blood supply but the delicate chemical balance neurons require to function. Plaque-encrusted artery walls eventually lose their elasticity and become brittle and thin, prone to cracking.

**Pathophysiology**

When an ischemic stroke occurs, the blood supply to the brain is interrupted and brain cells are deprived of the glucose and oxygen. Ischemic stroke is a complex entity with multiple etiologies and variable clinical manifestations. Thrombosis can form in the extracranial and intracranial arteries when the intima is roughened and plaque forms along the injured vessel. The endothelial injury (roughing) permits platelets to adhere and aggregate, then coagulation is activated and thrombus develops at site of plaque. Blood flow through the extracranial and intracranial systems decreases, and the collateral circulation maintains function. When the compensatory mechanism of collateral circulation fails, perfusion is compromised, leading to
decreased perfusion and cell death. During an embolic stroke, a clot travels from a distant source and lodges in cerebral vessels.

![Pathophysiology of stroke](image)

**Fig 1: Pathophysiology of stroke**

![Pathogenesis of Stroke](image)

**Fig 2: Pathophysiology of stroke**

**Symptoms of stroke**
Clinically when we are observing the patients the symptoms includes weakness, paralysis or numbness on one side of the body, loss of vision in one or both eyes, speech difficulties, being unable to speak, slurring of speech. Other common symptoms include confusion, dizziness, headache, nausea, vomiting, pain and shortness of breath.

F—Face drooling
A—Arms weakness
S—Speech loss  
T—situations changes with time
• Sudden numbness or weakness of the face, arm, or leg, especially on one side of the body.
• Sudden confusion, trouble talking, or understanding speech.
• Sudden trouble seeing in one or both eyes.
• Sudden trouble walking, dizziness, or loss of balance or coordination.
• Sudden severe headache with no known cause.

Transient Ischemic Attacks
The occurrence of a TIA is a warning that the person is at risk for a more serious and debilitating stroke.

Recurrent Stroke
The risk of a recurrent stroke is greatest right after a stroke, with the risk decreasing with time. About 3 percent of stroke patients will have another stroke within 30 days of their first stroke and one-third of recurrent strokes take place within 2 years of the first stroke.\textsuperscript{[5]}

How is the Cause of Stroke Determined?
• MRI-scanning, CT-scanning, Blood test, Thyroid function test, LFT RFT, Angiography.
• Doppler studies, blood test.
• Assessment of stoke patients quality of life researches the investigators depends on scales include the Glasgow Coma Scale, the Hunt and Hess Scale, the Modified Rankin Scale, and the Barthel Index.

Epidemiology
On average one American dies from stroke. Stroke was the second most frequent cause of death worldwide in 2011 accounting for 6.2 million deaths. Approximately 17 million people had a stroke in 2010 and 33 million people have previously had a stroke and were still alive. Between 1990 and 2010 the number of strokes decrease by approximately 10% in the developed world and increased by 10% in the developing world.\textsuperscript{[6]}

Other Risk Factors
The most important risk factors for stroke are hypertension, heart disease, diabetes, and cigarette smoking. Others include heavy alcohol consumption, high blood cholesterol levels, illicit drug use, and genetic or congenital conditions, particularly vascular abnormalities.
Hypertension
A systolic pressure of 120 mm of Hg over a diastolic pressure of 80 mm of Hg is generally considered normal. Persistently high blood pressure greater than 140 over 90 leads to the diagnosis of the disease called hypertension.

Heart Diseases
Atrial fibrillation is irregular beating of the left atrium, or left upper chamber, of the heart. In people with atrial fibrillation, the left atrium beats up to four times faster than the rest of the heart. This leads to an irregular flow of blood and the occasional formation of blood clots that can leave the heart and travel to the brain, causing a stroke. Atrial fibrillation, which affects as many as 2.2 million Americans, increases an individual's risk of stroke by 4 to 6 percent, and about 15 percent of stroke patients have atrial fibrillation before they experience a stroke. Atrial septal aneurysm (ASA), a congenital (present from birth) malformation of the heart tissue, is a bulging of the septum or heart wall into one of the atria of the heart. Researchers do not know why this malformation increases the risk for stroke.[7]

Blood Cholesterol Levels
Foods high in saturated fat and cholesterol, like meats, eggs, and dairy products, can increase the amount of total cholesterol in the body to alarming levels, contributing to the risk of atherosclerosis and thickening of the arteries. Total serum cholesterol tests while a level of more than 240 is considered dangerous and places a person at risk for heart disease and stroke.

Diabetes
Diabetes is another disease that increases a person's risk for stroke. People with diabetes have three times the risk of stroke compared to people without diabetes.

Modifiable Lifestyle Risk Factors
Smoking increases the risk of stroke by promoting atherosclerosis and increasing the levels of blood-clotting factors, such as fibrinogen. In addition to promoting conditions linked to stroke, smoking also increases the damage that results from stroke by weakening the endothelial wall of the cerebrovascular system. This leads to greater damage to the brain from events that occur in the secondary stage of stroke.
Alcohol consumption
High alcohol consumption is another modifiable risk factor for stroke. Generally, an increase in alcohol consumption leads to an increase in blood pressure. The consequences of this rebound effect are that blood viscosity (thickness) and platelet levels skyrocket after heavy drinking, increasing the risk for ischemic stroke.

Head and Neck Injuries
Head injury or traumatic brain injury may cause bleeding within the brain leading to damage akin to that caused by a hemorrhagic stroke. Neck injury, when associated with spontaneous tearing of the vertebral or carotid arteries caused by sudden and severe extension of the neck, neck rotation, or pressure on the artery, is a contributing cause of stroke, especially in young adults.[8]

Infections
Recent viral and bacterial infections may act with other risk factors to add a small risk for stroke. The immune system responds to infection by increasing inflammation and increasing the infection-fighting properties of the blood.[9]

Genetic Risk Factors
CADASIL is a rare, genetically inherited, congenital vascular disease of the brain that causes strokes, subcortical dementia, migraine-like headaches, and psychiatric disturbances.

Essential update: Updated guidelines on primary prevention of stroke released
The American Heart Association and American Stroke Association have released updated guidelines on the primary prevention of stroke. New recommendations include the following:
- Use of new oral anticoagulants, including dabigatran, apixaban, and rivaroxaban, in patients with nonvalvular atrial fibrillation
- Home self-monitoring of blood pressure in hypertensive patients
- Use of nonestrogen oral contraceptives in female patients with migraine with aura
- All patients should follow the Mediterranean diet supplemented with nuts and reduce sodium intake
- Screening for sleep apnea
- Smoking cessation
Primary Prevention of Stroke
Risk-reduction measures in primary stroke prevention may include the use of antihypertensive medications; warfarin; platelet antiaggregants; 3-hydroxy-3-methylglutaryl coenzyme A (HMG-CoA) reductase inhibitors (statins); smoking cessation; dietary intervention; weight loss; and exercise.

Modifiable risk factors include the following
- Hypertension
- Cigarette smoking
- Diabetes
- Dyslipidemia
- Atrial fibrillation
- Sickle cell disease
- Postmenopausal HRT
- Depression
- Diet and activity
- Weight and body fat

Secondary Prevention of Stroke
- A - Antiaggregants (aspirin, clopidogrel, extended-release dipyridamole, ticlopidine) and anticoagulants (warfarin)
- B - Blood pressure–lowering medications
- C - Cessation of cigarette smoking, cholesterol-lowering medications, carotid revascularization
- D - Diet
- E – Exercise

Preventing a stroke
The best way to prevent a stroke is to address the underlying causes. This is best done by living healthily. Here is a list of simple measures that can be followed:
- Avoid illicit drugs
- Eat a diet rich in fruit and vegetables and low in cholesterol and saturated fat
- Exercise regularly
- Keep blood pressure under control
- Keep diabetes under control
- Maintain a healthy weight
- Moderate alcohol consumption (or quit drinking)
- Quit smoking
- Treat obstructive sleep apnea (if present).

**Management of stroke thorough Medications**

Medication or drug therapy is the most common treatment for stroke. The most popular classes of drugs used to prevent or treat stroke are antithrombotics (antiplatelet agents and anticoagulants) and thrombolytics. Antithrombotics prevent the formation of blood clots that can become lodged in a cerebral artery and cause strokes. Antiplatelet drugs prevent clotting by decreasing the activity of platelets, blood cells that contribute to the clotting property of blood. These drugs reduce the risk of blood-clot formation, thus reducing the risk of ischemic stroke. The most widely known and used antiplatelet drug is aspirin, clopidogrel, ticlopidine, and dipyridamole.[10]

Anticoagulants reduce stroke risk by reducing the clotting property of the blood. The most commonly used anticoagulants include warfarin, heparin, and enoxaparin. Thrombolytic agents are used to treat an ongoing, acute ischemic stroke caused by an artery blockage. These drugs halt the stroke by dissolving the blood clot that is blocking blood flow to the brain. We can use other adjuvant medications includes hyperlipidemic drugs, cerebral activators, antibiotics for improving treatment outcomes.

**Surgery**

Carotid endarterectomy is a surgical procedure in which a doctor removes fatty deposits (plaque) from the inside of one of the carotid arteries, which are located in the neck and are the main suppliers of blood to the brain.

**Rehabilitation Therapy**

**Physical therapy (PT)** is the cornerstone of the rehabilitation process. A physical therapist uses training, exercises, and physical manipulation of the stroke patient's body with the intent of restoring movement, balance, and coordination. The aim of PT is to have the stroke patient relearn simple motor activities such as walking, sitting, standing, lying down, and the process of switching from one type of movement to another.
Another type of therapy involving relearning daily activities is occupational therapy (OT). OT also involves exercise and training to help the stroke patient relearn everyday activities such as eating, drinking, dressing, bathing, cooking, reading and writing, and toileting.

Speech language pathologists help stroke patients relearn language and speaking skills, including swallowing, or learn other forms of communication. A speech therapist helps stroke patients help themselves by working to improve language skills, develop alternative ways of communicating, and develop coping skills to deal with the frustration of not being able to communicate fully.

**Stroke Disabilities: Paralysis**
A common disability that results from stroke is complete paralysis on one side of the body, called hemiplegia. A related disability that is not as debilitating as paralysis is one-sided weakness or hemiparesis. The paralysis or weakness may affect only the face, an arm, or a leg or may affect one entire side of the body and face.

**Cognitive deficits**
Stroke may cause problems with thinking, awareness, attention, learning, judgment, and memory. In some cases of stroke, the patient suffers a "neglect" syndrome. The neglect means that a stroke patient has no knowledge of one side of his or her body, or one side of the visual field, or is unaware of the deficit. A stroke patient may be unaware of his or her surroundings, or may be unaware of the mental deficits that resulted from the stroke.

**Language deficits**
Stroke victims often have problems understanding or forming speech. A deficit in understanding or forming speech is called aphasia. Aphasia usually occurs along with similar problems in reading or writing. In most people, language problems result from damage to the left hemisphere of the brain. Slurred speech due to weakness or incoordination of the muscles involved in speaking is called dysarthria, and is not a problem with language.

**Emotional deficits**
A stroke can lead to emotional problems. Stroke patients may have difficulty controlling their emotions or may express inappropriate emotions in certain situations. One common disability that occurs with many stroke patients is depression. Post-stroke depression may be more than a general sadness resulting from the stroke incident.[10]
Pain

Stroke patients may experience pain, uncomfortable numbness, or strange sensations after a stroke. These sensations may be due to many factors including damage to the sensory regions of the brain, stiff joints, or a disabled limb.

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<thead>
<tr>
<th>Post-Stroke Rehabilitation</th>
<th>Goal</th>
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<tbody>
<tr>
<td>Physical Therapy (PT)</td>
<td>Relearn walking, sitting, lying down, switching from one type of movement to another</td>
</tr>
<tr>
<td>Occupational Therapy (OT)</td>
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</tr>
<tr>
<td>Speech Therapy</td>
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</tr>
<tr>
<td>Psychological/Psychiatric Therapy</td>
<td>Alleviate some mental and emotional problems</td>
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Fig 3: Post-Stroke Rehabilitation approaches

CONCLUSION

Finally we are concluding that stroke is a devastating and prevalent in worldwide. Advising the patients about etiological factors and modification of risk factors in health care are the keys through lifestyle modifications and strengthening the activities of stroke patients towards exercise, physiotherapy, medication adherence. We can assure the independence in activities of daily living in stroke patients. These measurements makes successful stroke prevention strategy on both an individual and a public health level.

REFERENCES

5. The American Stroke Association is solely focused on reducing disability and death from stroke.

