Stroke: A mini review updating the briefings of ischemic strokes and management.

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Abstract

The World Health Organization defines stroke as a clinical illness characterised by quickly increasing clinical indications of focal (or global in the case of coma) disruption of brain function lasting more than 24 hours or leading to death, with no obvious explanation other than a vascular origin. Ischemic stroke, hemorrhagic stroke, and subarachnoid haemorrhage are the three main types of stroke. Ischemic stroke occurs when a blood artery is blocked, limiting blood flow to the brain, whereas hemorrhagic stroke happens when a blood vessel ruptures, spilling blood into the cerebral cavity. This article is a mini review about acute ischemic strokes and management.

Keywords: Ischemic, Stroke, Artery, Brain, Function.

Introduction

Stroke is the world's second leading cause of death and the third leading cause of disability. While stroke has generally been associated with older age groups, a high number of ischemic strokes are now being reported in young persons in their 30s and 40s. Adolescents in their teens or early twenties are sometimes affected.

A stroke, every so often known as a brain attack, takes place when something blocks blood delivery to a part of the brain or when a blood vessel with inside the brain bursts. Parts of the brain are injured or die in both cases. A stroke can result in long-term brain damage, disability, or even death. A clot obstructing blood flow to the brain (called an ischemic stroke) or a blood vessel rupturing and restricting blood flow to the brain (called a hemorrhagic stroke) can both cause stroke (called a haemorrhagic stroke). A brief clot causes a TIA (transient ischemic attack), sometimes known as a "mini stroke. "Ischemic strokes account for 70 per cent of all strokes, while hemorrhagic strokes account for 30%. Acute coronary syndrome (ACS) is the most common cause of death in India, and the three most common risk factors for ACS are smoking (40%), high blood pressure (38%), and diabetes (30%). We may fairly predict that India has a very high incidence of stroke based on the aforementioned data and the fact that stroke and ACS share common risk factors [1].

A Transient Ischaemic Attack (TIA) is defined as a "transient episode of neurological dysfunction caused by focal brain, spinal cord, or retinal ischaemia without acute infarction." Ischaemic stroke is defined as an episode of neurological dysfunction caused by focal cerebral, spinal, or retinal infarction with symptoms lasting more than 24 hours. TIAs are commonly referred to as mini-strokes because the symptoms are brief (lasting minutes to hours but not more than 24 hours).

Ischemic stroke classification

There are three types of ischemic stroke, according to the multicenter Trial of Acute Stroke Treatment (TOAST)

1. Large vessel stroke
2. Small vessel stroke or Lacunar stroke
3. Cardioembolic stroke

Strokes caused by thrombotic or embolic occlusion of major arteries in the brain, such as the internal carotid artery, middle cerebral artery, anterior cerebral artery, or vertebrobasilar system, can cause large artery strokes. Lacunar strokes are more commonly caused by the involvement of smaller or perforating blood vessels that supply the brain's deeper structures [2].

Risk Factors

Majority of the ischemic strokes seen in patients with cardiovascular disease are embolic. Embolic strokes may arise directly from the heart or the aorta. Following is the list of conditions that carry a high risk for embolic strokes mentioned in Table 1.

Symptoms

A stroke's signs and symptoms differ from person to person, but they usually start suddenly. Because different sections of

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Table 1. *List of Factors provoking ischemic stroke.*

Modifiable	Non Modifiable	Cardiac disease
• Hypertension	• Age	**Arrhythmias** • Atrial fibrillation and paroxysmal atrial fibrillation • Sick sinus syndrome • Sustained atrial flutter
• Diabetes mellitus	• Race	**Valvular Heart Disease** • Rheumatic mitral or aortic valve disease • Bioprosthetic and mechanical heart valves • Fibrous nonbacterial endocarditis (ie, Libman-Sacks endocarditis), antiphospholipid syndrome, and cancer (marantic endocarditis), systemic lupus erythematosus • Infective endocarditis
• Oral contraceptive use/ postmenopausal hormone use.	• Sex	Structural Heart Disease • Recent myocardial infarction (within one month) • Chronic myocardial infarction together with ejection fraction <28% • Congestive heart failure with ejection fraction <30% • Dilated cardiomyopath
• High cholesterol	• Ethnicity	Thrombus and Structural Lesion • Papillary fibroelastoma • Left atrial myxoma • Atrial or ventricular thrombus
• Previous stroke	• History of migraine headaches	Valvular Heart Disease • Rheumatic mitral or aortic valve disease • Bioprosthetic and mechanical heart valves • Fibrous nonbacterial endocarditis (ie, Libman-Sacks endocarditis), antiphospholipid syndrome, and cancer (marantic endocarditis), systemic lupus erythematosus • Infective endocarditis
• Carotid stenosis	• Fibromuscular dysplasia	Coronary artery bypass graft (CABG) surgery • Conditions which have been associated with embolic stroke but lack definitive evidence are mitral annular calcification, patent foramen ovale, left atrial smoke on echocardiogram, atrial septal aneurysm, left ventricular aneurysm and aortic arch atheroma. • Genetic diseases, storage diseases, traumatic vascular diseases [3, 4]
• Hyperhomocystinemia	• Heredity: Family history of stroke or transient ischemic attacks (TIAs)	
• Lifestyle issues: Excessive alcohol intake, tobacco use, illicit drug use, physical inactivity, Obesity		

your brain govern different parts of your body; the symptoms you experience will vary depending on which region of your brain is injured and how severe the damage is [3,4].

Initial symptoms can be:

1. Sudden numbness or weakness in the face, arm, or leg, especially on one side of the body.
2. Sudden confusion, trouble speaking, or difficulty understanding speech.
3. Sudden trouble seeing in one or both eyes.
4. Sudden trouble walking, dizziness, loss of balance, or lack of coordination.
5. Sudden severe headache with no known cause.

The most effective stroke treatments are only accessible if the stroke is noticed and diagnosed within three hours of the onset of symptoms. If patients do not arrive at the hospital in a timely manner, they may be ineligible for these services [5].

Act F.A.S.T and perform the following test if you suspect someone is having a stroke:

The main stroke symptoms can be remembered with the word FAST:

Face – the face may have dropped on 1 side, the person may not be able to smile, or their mouth or eye may have drooped.

Arms – the person may not be able to lift both arms and keep them there because of weakness or numbness in 1 arm.

Speech – their speech may be slurred or garbled, or the person may not be able to talk at all despite appearing to be awake; they may also have problems understanding what you're saying to them.

Time – it's time to dial 999 immediately if you notice any of these signs or symptoms [6].

Management of acute stroke

Time is the most crucial aspect in the treatment of acute

ischemic stroke. A patient suffering from an ischemic stroke loses 190,000 brain cells per minute, 14000,000,000 nerve connections per minute, and 12 km (7.5 miles) of nerve fibres every minute. Acute ischemic stroke can be treated using one of two therapeutic techniques. Mechanical thrombectomy and intravenous thrombolysis. Once the clinical diagnosis of an acute stroke is made the following steps need to be followed.

- Ensure that the patient is medically stable.
- Evaluate for reversible causes of neurological symptoms.
- Determine the nature of stroke (ischemic vs hemorrhagic)
- Treatment of stroke.
- Determine the causes of stroke [7].

Always remember the ABCs when it comes to ensuring the patient's medical stability. Time is of the essence in the treatment of acute stroke. The patient's medical stability should be established as soon as feasible so that stroke management can begin [8]. Every medical emergency necessitates a thorough examination of the airway, breathing, and circulation. Large strokes, cerebral haemorrhage, and posterior circulation strokes all cause loss of consciousness, bulbar dysfunction, and occasionally respiratory distress. Hypoxia should be avoided at all costs, and if the airway is not protected or the patient requires ventilator assistance, intubation should be explored.

Additional investigations to aid in management can be undertaken depending on the timing of start of symptoms [9].

If the patient appears within the first 6 hours of beginning of symptoms, a CT scan of the brain and neck should be paired with a CT angiography to rule out major artery occlusion. The CT angiography should not be postponed because of the serum creatinine level. To minimise time for any mechanical intervention, a CT angiography should be conducted with the CT scan if possible.

Within the first 6 hours after symptom onset, an MRI, MR angiography, or MR perfusion is not recommended.

For individuals who visit between 6 and 24 hours after the onset of symptoms: Obtaining CT perfusion, Diffusion weighted-MRI, or MRI perfusion in chosen patients with acute ischemic stroke between 6–24 hours of last known normal who have major artery occlusion in the anterior circulation is indicated to aid in patient selection for mechanical thrombectomy [10].

Conclusion

Stroke is one of the leading causes of death worldwide and the main contributor to long-term disability in developed nations. The diagnostic and therapeutic options available to lessen the effects of acute ischemic stroke have significantly improved during the past ten years. The most important first step in stroke care is early diagnosis of individuals with stroke and triage to facilities competent to provide the necessary treatment as quickly as feasible. Here, we review the data supporting pre-hospital and emergency stroke care, including the use of emergency medical services protocols for stroke patient identification, intravenous thrombolysis in acute ischemic stroke, including updates to recommended patient eligibility criteria and treatment time windows, and advanced imaging techniques with automated interpretation to identify stroke patients with significant brain at-risk areas but without significant completed infarcts.

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