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A review on cerebro-vascular accidents

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Abstract

A stroke, also known as a cerebral vascular accident, occurs when an artery in the brain becomes blocked, either temporarily or permanently, preventing blood and oxygen from reaching brain cells. Death and damage to brain tissue occur when either of these conditions is met. When a person suffers a stroke, they lose the ability to speak, move, and remember because of the death of two million brain cells every minute. There is a correlation between having a lot of dead brain cells and having a higher chance of having some kind of permanent brain damage, disability, or death.

Keywords: Cerebro vascular accidents, risk factors, rehabilitation, management

"The human brain has 100 billion neurons, each neuron connected to 10 thousand other neurons. Sitting on shoulders is the most complicated object in the known universe."

-Michio Kaku

Introduction

Stroke, often known as paralysis, is the leading cause of mortality and, in certain circumstances, causes considerable disability among adults. This is a type of non-communicable condition. (Das SK, Banerjee TK *et al*, 2007) ^[14]. Stroke is a debilitating illness that can negatively affect a person's intelligence, emotional state, physical capacity, and overall quality of life. This disease also results in pressure on the care giver, most of the times leading to economic stress on the person, families and at the level of nation. (Das SA. Das Hazra, *et al*. 2007) ^[14]. According to current estimates, roughly 1.5 people per 1000 in India will suffer a stroke each year, and 41 percent of those who suffer an acute stroke will likely perish in the same time period. So, out of India's current population of 1.2 billion, over 1.8 million people may suffer from stroke each year, with almost one third of those affected ultimately succumbing to the disease.

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The belief that someone had been hurt by a "stroke of God's hand" is where the term "stroke" first appeared. Stroke refers to the damage done to the brain and the resulting cell death. Like a heart attack, but affecting the brain instead of the heart, is a stroke. Traumatic brain injury is called a stroke or Cerebro Vascular Accident (CVA).

Cerebral arteries are vulnerable to both transient and permanent blockage, and both these types of blockages can affect brain function.

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Stroke is usually reserved for situations where there is a blockage that will not dissolve quickly or on its own. Physical or mental impairments caused by such blockages can have lasting consequences.

In a stroke, either the brain's blood supply is suddenly cut off or there is bleeding inside the skull, both of which lead to abrupt and severe impairment of the brain function. Stroke ranks high on the list of major health concerns in the twenty-first century, as it is one of the main causes of mortality in the world.

In modern times, stroke has become the leading cause of permanent disability. Over the past two decades, there is a dramatic rise in the incidence of complications following a stroke. Stroke survivors have a poor quality of life, characterized by low levels of exercise and social engagement. Stroke is also a major contributor to deficits in daily functioning. Strokes are not age-specific. Under-65 years of age adults make up one-fourth of stroke victims. The person who may become disabled and even their loved ones and caregivers, all undergo significant changes as a result of this tragedy.

Stroke, also known as a cerebrovascular accident, occurs when brain cells die suddenly from a lack of blood and oxygen owing to an obstruction of an artery in the brain or a ruptured blood vessel. Brain injury and cell death result from either of these conditions. When a person suffers a stroke, they lose the ability to speak, move, and remember. One to two million brain cells die every minute for reason of reduced blood supply.

The pathophysiology of stroke can be roughly classified into two major groups: Ischemic stroke and Hemorrhagic stroke. When blood clots or plaque and other fatty deposits gradually block an artery, it results in an ischemic stroke. When a blood artery in the brain bursts and bleeds, it causes a hemorrhagic stroke. A Transient Ischemic Attack (TIA) can occur because of a momentary blockage.

Potential causes can be lifestyle risk factors like, smoking, alcohol consumption, Physical inactivity, Obesity. Modifiable factors such as, High blood pressure, Atrial fibrillation, High blood sugar, High cholesterol and, non-modifiable factors such as Age, Gender, Family history of stroke and Race. Emerging risk factors are HIV/AIDS, SLE, SCD - sickle cell disease, rheumatoid arthritis, and syphilitic vasculitis may all lead to stroke.

Clinical manifestations include- Morning signs in clients with stenosis of great blood vessels in the neck, Hemiplegia,

Transient loss of speech and Paresthesia involving half of the body.

Diagnostic Evaluation

1. Collection of clients history; It includes any head injury, accidents, brain infections like meningitis, encephalitis, co morbidities like diabetes, hypertension, etc.
2. Physical examination includes neurological examinations and funduscopy.
3. Blood studies includes full blood count to detect polycythemia, erythrocyte sedimentation rate (ESR) for endocarditis, serum electrolytes, renal function tests, coagulation studies includes PT, APTT, INR, cardiac enzymes like troponin, CKMB,CPKMB, lipid profile ,diabetic work up cholesterol level etc.
4. Culture and sensitivity of CSF to detect any meningitis and encephalitis.
5. Analysis of cerebro spinal fluid (CSF).
6. X-Ray study of skull.
7. ECG to rule out arrhythmias and myocardial infarction (MI).it is needed in all the clients with stroke (AHA/ASA protocols and guidelines).
8. Echocardiography to identify valvular disease and intra cardiac clots.
9. Cerebral angiography.
10. CT-it helps to detect hemarrhagic stroke.
11. MRI of brain: it provides a multidimensional view of brain in a variety of radio imaging slides which helps to detect and identify lesions at dorsal fossa particularly in posterior circulation stroke such as cerebellum and in pons. It is also suggested in clients with transient neurologic manifestations have a neuroimaging within 24hours or as early as possible.
12. Glasgow coma scale concludes regarding consciousness level and prompts to start interventions.

Common failures/misjudgments in prompt management of stroke

1. Aggressive and early management of increased blood pressure in stroke.
2. Hypertensive encephalopathy could be falsely diagnosed as hemorrhagic stroke.
3. Failure or improper diagnosis and treatment of hyperglycemia and hypoglycemia.
4. Poor diagnosis and improper management of complications of stroke.

Table 1: Phases of contemporary management of stroke

Phases	Period From Onset	Activities	Preferred Location
1.Acute(emergency) care: hyper acute or acute	First to seventh day	1.Assessment 2.prompt and early supportive care	Institutional or hospital
2.Early sub-acute (supportive) care	Second to fourth week	1.prevention and treatment of complications	Hospital
3.Late sub-acute (maintenance) care	Second to sixth month	1.Intiation of rehabilitation 2.Providing supportive psychological support 3.prevention of onset recurrence	Institutional or Community
4.Long term (chronic) care	Seventh month onwards	1.continuation of rehabilitation 2.sustained psychological support 3.prolonged social support 4.prevention of further recurrence	Community

Medical management

It consists of the following treatment modalities-Supportive management like Maintenance of patent airway, Regulation of normal body temperature, Monitoring and recording of blood pressure, Cardiac assessment and Periodical assessment of blood glucose level. Thrombolysis-intravenous or intra-arterial, Antiplatelet drugs, Anticoagulant drugs, Hemodilution, vasodilators and Neuroprotective agents.

Complications of stroke

Stroke complications can include hyperglycemia, hypoglycemia, high blood pressure, low blood pressure, fever, infarct extension or rebleeding, cerebral oedema, herniation, coning, aspiration, aspiration pneumonia, urinary tract infection, cardiac dysrhythmia, deep vein thrombosis, and pulmonary embolism. Haemorrhage is the major cause of mortality in the first three days after a stroke begins, while cerebral infarction is the leading cause of death between the third and sixth day. Transtentorial herniation and bleeding are the top causes of death in the first week after a stroke has started. Complications from being bedridden, such as pneumonia, sepsis, and pulmonary embolism, are the leading cause of death in the first week after a stroke.

Management of stroke by surgical method for Ischemic stroke: Endovascular procedures or interventions-it includes the following Angioplasty, Extraction of clot, Disruption of clot, etc. Supportive treatment includes- Maintenance of patent airway and good ventilation, Fluid management or hydration therapy, Management of temperature, Usage of Anticoagulants, Management of blood pressure, Management of blood glucose level, Use of Anticoagulants, and Use of Antiplatelet.

Prevention of stroke

There are several ways to prevent stroke, including

Lowering blood pressure: High blood pressure is a major risk factor for stroke. Person can reduce blood pressure by eating a healthy diet, exercising regularly, and taking medication if necessary.

Losing weight: Obesity raises persons odds of having a stroke. If person is overweight, losing as little as 10 pounds can have a real impact on stroke risk.

Exercising more: Exercise contributes to losing weight and lowering blood pressure, but it also stands on its own as an independent stroke reducer. Aim for at least 30 minutes of moderate-intensity activity a day.

Quitting smoking: Smoking increases persons risk of stroke, so quitting is one of the best things persons can do to prevent it.

Avoiding excessive alcohol consumption: Drinking too much alcohol can raise person's blood pressure and increase risk of stroke. If you drink, do so in moderation.

Eating a healthy diet: A diet rich in fruits, vegetables, whole grains, lean protein, and low-fat dairy can help lower risk of stroke.

Controlling diabetes: People with diabetes are at higher risk of stroke. Person can control blood sugar levels by eating a healthy diet, exercising regularly, and taking medication if necessary.

Stroke support organizations

There are many organizations working actively to impart the knowledge and awareness of people regarding stroke. The main motto of the association is to minimize the morbidity and mortality of stroke in the people. Kokilaben Dhirubai Ambani Hospital and Medical research institute is an emerging and highly advanced client care centre which sets another mile stone by hosting India's 1st stroke support group with scientific plan for stroke patients. It provides a complete care to the stroke and paralyzed clients. Mr. Godbole a stroke client warns the general population how not to ignore the stroke signs. And he is creating awareness by his twenty-two piece body art titled Confessions. Another stroke support group called Aphasia, and Stroke Association of India is a no income social service organization and is committed to provide essential service, education, training and awareness regarding stroke, aphasia and its complications. A former famous cricketer, Sunil Gavaskar is announced as Ambassador for stroke in India at the tenth World Stroke Congress (WCS).

Rehabilitation

Physicians, physiotherapists, occupational therapists, nurses, speech therapists, clinical psychologists, orthotists, dietitians, and social workers all play important roles in the rehabilitation of stroke patients.

Many neurologists and researchers have shown that patients who actively participate in rehabilitation programmes after suffering a stroke have far better outcomes. A client's health improves and the client's ability to live a fulfilling life is enhanced via consistent participation in physical training and rehabilitation programmes.

The physiotherapy clinic in Sukino offers a variety of services for those recovering from strokes, including mobility training, constraint induced therapy, and range of motion exercises. At the Sukino centre, nurses and other medical staff organise a wide range of therapeutic activities for stroke patients, including physiotherapy and other forms of physical activity. The stroke sukino organisation, also known as a centre for the rehabilitation of stroke patients, has locations in both Bengaluru and Kerala.

The Mayo Clinic is widely regarded as a top facility for stroke recovery. The clinic's primary focus is helping people regain cognitive function after a stroke or other neurological disorder.

The principal stages of rehabilitation service which is essential to be started within the first three months of golden time. Rehabilitation services are offered in 6 phases_ from the time of attack to client becoming independent. Encouraging the client for physical activity and emotional support is the key to successful rehabilitation.

Conclusion

Stroke, a major Non-Communicable Disease (NCD), is responsible for 3.5% of disability adjusted life year (DALY) in India. Apart from risk factors like hypertension, diabetes, heart diseases and positive family history, other lifestyle

related factors such as unhealthy diet, obesity, lack of physical activity, stress and tobacco use account for its occurrence. Changes in lifestyles, behavioral patterns, demographic profile (aging population), socio-cultural and technological advancements are leading to sharp increases in the prevalence of stroke. The disease by and large can be prevented by making simple changes in the way people live their lives or simply by changing our lifestyle.

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