Tikrit university

College of Nursing

Clinical Nursing Science

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Critical Care Nursing

(Stroke)

By Dr.Mohammed M.Abdullah

Stroke

Stroke: Sudden onset of acute neurological deficit persisting for more 24 hours and caused by the interruption of blood flow to the brain.

Transient ischaemic attack (TIA): neurological dysfunction due to temporary focal cerebral or retinal ischaemia without infarction, e.g. a weak limb or-loss of vision, usually lasting seconds or minutes with complete recovery. TIAs may herald a stroke.

Classification and etiology of Stroke:

• **Ischemic stroke/infarction** (85%)

– thrombotic

– large and/ or small -artery stenosis

– cardio-embolic

• **hemorrhagic stroke** (10%)

– intracerebral haemorrhage (ICH)

– subarachnoid haemorrhage (SAH)

• **Other** (5%), e.g. arterial dissection, venous sinus thrombosis, vasculitis

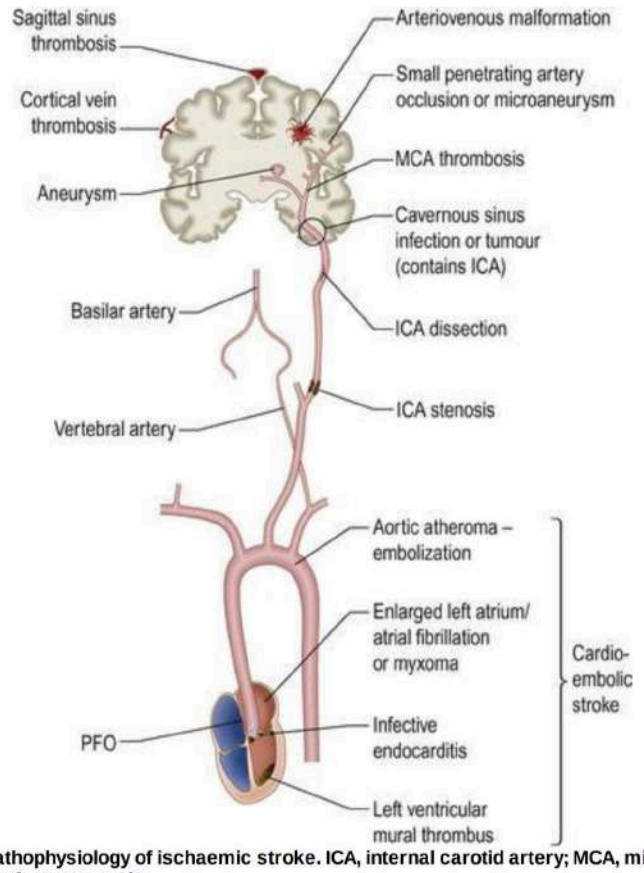

FIGURE 21.30 **Pathophysiology of ischaemic stroke. ICA, internal carotid artery; MCA, middle cerebral artery; PFO, patent foramen ovale.**

Risk factor for stroke:

Factors reducing stroke risk

Risk factor	Action	Reduction in stroke risk		
		Infarction	Haemorrhage	Relative risk reduction in secondary prevention
Hypertension	Treatment and monitoring	++	++	28%
Smoking	Cessation	++	+	33%
Lifestyle	Greater activity	+	0	
Alcohol	Moderate intake	+	+	
High cholesterol	Statins, diet	+	0	24%
Atrial fibrillation	Anticoagulation	++	*Increases* risk slightly	67%
Obesity	Weight reduction	Probable	Probable	
Diabetes	Good control	+	0	
Severe carotid stenosis	Surgery	++	0	44%
Sleep apnoea	Treatment	+	0	

++, major correlation with reduced stroke risk; +, moderate correlation; SAH, subarachnoid haemorrhage.

- **Pathophysiology of ischemic stroke:** When cerebral blood flow is reduced to a level insufficient to maintain neuronal viability, ischemic injury occurs. In focal stroke, an area of hypoperfused tissue, the ischemic penumbra, surrounds a core of ischemic cells. The ischemic penumbra can be salvaged with return of blood flow. Cerebral edema is sufficient to produce clinical deterioration develops in 10% to 20% of patients with ischemic stroke and can results in intracranial hypertension. The edema results from a loss of normal metabolic function of the cells and peaks at 4 days. This process is commonly the cause of death during the first week after stroke. Secondary hemorrhage at the site of the stroke lesion, known as hemorrhagic conversion, and seizures are the two other major acute neurological complication of the ischemic stroke

- **Assessment and Diagnosis of ischemic stroke :**

Neurological Abnormalities in Acute Ischemic Stroke:

A.Left (Dominant) Hemisphere.

- Aphasia.
- Right hemiparesis.
- Right – sided sensory loss.
- Right visual field defect.
- Dysarthria.

B. Right (Nondominant) Hemisphere.

- Left visual field defect.
- Left hemiparesis.
- Left – sided sensory loss.

C.Brainstem, Cerebellum, and posterior hemisphere.

 Motor or sensory loss in all four limbs.

 Dysarthria.

 Nystagmus

 Bilateral visual field defects.

Diagnostic Procedure of ischemic stroke include:

A. Non – contrast CT scanning. (Excluding intracranial hemorrhage, assist in identifying early neurological complication and the cause of insult).

B. MRI. (Demonstrate infarction of cerebral tissue earlier than CT, useful in emergency differential diagnosis).

C. ECG.

D.Echocardiography. (Identifying cardioembolic phenomenon).

E.Electroencephalogram (if seizures are suspected).

Medical Management of ischemic stroke :

1. Thrombolytic therapy within 3 to 4.5 hours of onset of ischemic stroke.

2. Confirmation of diagnosis with CT must be accomplished before thrombolytic therapy

3.Airway protection and ventilatory assistance to maintain adequate tissue oxygenation.

4. Hypertension is not lowered for the patient received thrombolytic therapy, antihypertensive therapy is considered only if the diastolic blood pressure is greater than 120 mmHg or the systolic blood pressure is greater than 220 mmHg

5. Body temperature and glucose level also must be normalized.

6.Management of cerebral edema and seizure activity.

Subarachnoid Hemorrhage (SAH)

1. Is bleeding into the subarachnoid space, which is usually caused by rupture of a cerebral aneurysm or arteriovenous malformation.

2. Aneurysmal (SAH) is associated with mortality rate of 25 to 50 % with most patients dying on the first day after the insult.

Assessment and Diagnosis of SAH :

A. Abrupt onset of pain, described as the " worst headache of my life".

B. Brief loss of consciousness.

C. Nausea.

D. Vomiting.

Diagnostic Procedure of SAH include:

A.CT. findings :Non – contrast CT., 95% of the cases CT can demonstrate blood in the subarachnoid space if performed within 48 hours of the hemorrhage.

B. Lumber puncture results. (CSF, appear bloody and has a red blood cells count greater than 1000 cells / mm3

Medical Management of SAH:

1. Airway management and ventilatory assistance may be necessary.

2. Surgical clipping of aneurysms.

3. Surgical Excision of ateriovenous malformation.

Intracerebral hemorrhage (ICH)

1. Is bleeding directly into cerebral tissue, (ICH) destroy cerebral tissue causes cerebral edema, and increase ICP.

2. The source of Intracerebral bleeding is usually a small artery, but it can result also from rupture of an ateriovenous malformation (AVM)or aneurysm.

3. Spontaneous ICH is caused by hypertension and at least 10% of all stroke admissions.

4. The mortality rate of hemorrhagic stroke is up to 50% within 1 month

Etiology of ICH:

1. Long – standing history of hypertension.

2. Anticoagulant or thrombolytic therapy.

3. Coagulation disorder.

4. Cerebral infarct.

5. Brain tumors.

Assessment and Diagnosis OF ICH ,History and signs may reveals:

A. Patient unconsciousness and needs ventilator.

B. Sudden onset of focal deficit.

C. Severe headache D. Nausea.

E. Vomiting.

Diagnostic Procedure of ICH include:

A.CT. findings

B. Angiography for patient considered surgical candidates without clear cause of hemorrhage.

Medical Management of ICH

1. Initial management requires attention to airway, breathing , and circulation .

2. Intubation is usually necessary.

3. Reduction in blood pressure is usually necessary to decrease ongoing bleeding, but lowering blood pressure too much or too rapidly may compromise cerebral perfusion pressure.

4. Mannitol for management of ICP.

5.Body temperature is maintained at less than 38.5º C through use of acetaminophen or cooling blankets.

6.Euglycemia , a blood glucose level less than 140 mg / dL, is maintained with insulin therapy, but hyperglycemia should be avoided.

7.Anticonvulsant therapy is initiated if the patient experience seizures.

8. Surgical evacuation of the clot is recommended for the patients with cerebral hemorrhage greater than 3 cm with neurological deterioration or hydrocephalus with brainstem compression

Nursing Management for Patient with Stroke

Nursing priorities

1. Monitoring for changes in neurological and hemodynamic status:

A. Monitor for neurological signs and vital signs

B. Blood pressure cuff.

C. Pulse oximeter.

D. Seizure activity identified and treated.

2. Maintaining Surveillance for complications:

A. Monitor for signs of bleeding:

Sudden onset of or an increase in headache and nausea and vomiting.

B. Precautions that prevent SAH, and precipitate rebleeding:

Blood pressure control.

Bed rest.

The head of the bed should be elevated to 35 – 45 degrees at all time

C.Impaired Swallowing:

- Observed signs of dysphagia which include :
- Drooling.
- difficulty handling oral secretions.
- absence of gag reflex.

3. Educating the patient and family