Tikrit university

College of Nursing

Clinical Nursing Science

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Critical Care Nursing

(Coma)

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Coma

*Normal consciousness = Awareness and arousal(wakefulness)

*Consciousness depends on two closely related brain functions: **wakefulness** (i.e. arousal, alertness) and **awareness** (of self or of the environment, often referred to as the "content" of consciousness)

⍰ Disorder of consciousness (four discrete disorder) :

1. Coma : absence of both wakefulness(arousal) and awareness.

2. Vegetative state: presence of wakefulness with absence of awareness.

3. Minimally conscious state: presence of wakefulness and severe diminished of awareness but not absent.

4. Locked – in syndrome: presence of wakefulness and awareness but quadriplegic and inability to communicate verbally.

⍰ **Definition of coma :** is the deepest state of unconscious ; arousal and awareness are lacking.Coma may be conveniently defined as a GCS score of 8 or lower. It's a symptom rather than disease, and it occurs as results of some underlying process.

⍰ Etiology of coma: Divided into 2 general categories

I. Structural or Surgical.

1. Ischemia stroke, Intracerebral hemorrhage (ICH), Brain Tumors, Epidural hematoma, Subdural hematoma, Brain contusion, Subarachnoid hemorrhage, Posterior fossa hemorrhage , Supratentorial hemorrhage, Hydrocephalus

2. Trauma.

3. Diffuse axonal injury.

II. Metabolic or Medical.

1. Drug over dose, Opioid overdose, Alcohol 2. Infectious disease.

3. Endocrine disorder.4. Poisoning.

5. Meningitis, Encephalitis, Metabolic encephalopathy

6. Metabolic conditions.

7. Hypoglycemia, Hyperglycemia, Hyponatremia, Hypercalcemia

8. Hyperosmolar states. 9. Uremia.

10.Hepatic encephalopathy. 11.Hypertensive encephalopathy.

12.Hypoxic encephalopathy. 13.Myxedema.

14.Intoxication. 15.Psychogenic causes.

Pathophysiology

Consciousness is dependent on the functioning of two separate anatomical and physiological systems:

• The ascending reticular activating system (ARAS), projecting from brainstem to thalamus ,This determines arousal (the level of consciousness).

• The cerebral cortex, which determines the content of consciousness.

Level of consciousness represents a continuum between being alert and deeply comatose. It may be quantified using the Glasgow Coma Scale (GCS) with a score between 3 and 15. Coma may be conveniently defined as a GCS score of 8 or lower.

Ascending fibers of the reticular activating system (ARAS) in the pons, thalamus maintain **arousal** as an autonomic function. Neurons in the cerebral cortex are responsible for **awareness**. Diffuse dysfunction of both cerebral hemispheres and diffuse or focal dysfunction of the reticular activating system can produce coma. Structural causes usually produce compression or dysfunction in the area of the ARAS, whereas most medical causes lead to general dysfunction of both cerebral hemispheres.

Assessment and Diagnosis

1. Assessment of level of consciousness.

2. Medical history.

3. Physical examination

4. Neurological examination:

A. Assessment of pupillary size and reaction to light (normal , sluggish, or fixed).

B. Assessment of extraocular eye movements (normal , asymmetrical , or absent).

C. Assessment of motor response to pain (normal , decorticate, decerebrate, or flaccid).

D. Assessment of breathing pattern (Cause structural or metabolic).

Diagnostic procedure:

*Baseline; Blood glucose,Urea and creatinine and Electrolytes.

*Chemical-toxicologic analysis of blood and urine

*Cranial CT or MRI(structural causes)

*CSF examination(To exclude CNS infection)

*Arterial blood gas analysis is helpful in patients with lung disease and acid-base disorders.

▯ Medical Management

1. Emergency measures to support vital functions and prevent further neurological deterioration.

2. Protection of the airway and ventilator assistance are often needed.

3. Administration of thiamine (at least 100mg) , glucose, and opioid antagonists is suggested when cause is not immediately known.

4. Thiamine is administered before glucose , because the coma produced by

thiamine deficiency , Wernike's encephalopathy, can be precipitated by a glucose load.

5. Supportive measures to maintain physiological body functions and prevent complications.

6. Intubation for continued airway protection and nutritional support are essential .

7. Fluid and electrolyte management is often complex because of alteration in the neurological system.

8. Anticonvulsant therapy may be necessary to prevent further ischemic damage to the brain.

▯ Nursing Diagnosis Priorities for comatose patients :

1. Ineffective Airway Clearance related to excessive secretions or abnormal

viscosity of mucus.

2. Imbalanced Nutrition: Less than Body Requirements related to lack of

exogenous nutrients or increased metabolic demand.

3. Risk for Aspiration.

4. Risk for infection.

5. Compromised Family Coping related to critically ill family member.

▯ Nursing Management of comatose patient :

1. Monitoring for changes in neurological status and clues to the origin of the coma.

2. Supporting all body functions.

A. Promoting pulmonary hygiene.

B. Maintaining skin integrity.

C. Initiating range – of – motion exercise.

D. Managing bowel and bladder function.

E. Ensuring adequate nutritional support.

3. Maintaining surveillance for complications.

4. Providing comfort and emotional support

5. Initiating rehabilitation measures.