Nursing Care of Nervous system

Quick review notes – SN Lumbini

Nursing Care of the Nervous System (6.3.1)

The nervous system is a complex network responsible for coordinating body activities through electrical and chemical signals. Disorders of the nervous system require specialized nursing care to manage symptoms, prevent complications, and promote recovery. Below is a detailed breakdown of nursing care for specific neurological conditions.

6.3.1.1. Meningitis

Definition: Meningitis is the inflammation of the meninges (protective membranes covering the brain and spinal cord), often caused by infection (bacterial, viral, or fungal).

Causes:

- Bacterial: *Streptococcus pneumoniae*, *Neisseria meningitidis*, *Haemophilus influenzae*.
- Viral: Enteroviruses, herpes simplex virus.
- Fungal: *Cryptococcus* (common in immunocompromised patients).

Symptoms:

- Fever, headache, neck stiffness (nuchal rigidity).
- Photophobia, altered mental status, irritability.
- Positive Kernig's and Brudzinski's signs (pain on leg extension or neck flexion).
- Seizures, vomiting, and rash (in meningococcal meningitis).

Nursing Assessment:

- Monitor vital signs, especially for fever and signs of increased intracranial pressure (ICP).
- Assess neurological status using the Glasgow Coma Scale (GCS).
- Check for meningeal irritation signs (Kernig's, Brudzinski's).
- Observe for seizures or changes in level of consciousness (LOC).

Nursing Interventions:

- **Isolation Precautions**: Use droplet precautions for bacterial meningitis until 24 hours after starting antibiotics.
- **Manage Fever**: Administer antipyretics (e.g., acetaminophen) and provide cooling measures.
- **Reduce ICP**: Position the head at 30 degrees, minimize stimulation (dim lights, reduce noise), and administer prescribed medications (e.g., mannitol).
- **Antibiotic Therapy**: Administer IV antibiotics (e.g., ceftriaxone) promptly for bacterial meningitis.
- **Hydration**: Maintain IV fluids to prevent dehydration but avoid fluid overload.
- **Seizure Precautions**: Keep side rails up, have suction equipment ready, and administer anticonvulsants if prescribed.
- **Monitor Complications**: Watch for signs of septicemia, brain abscess, or hearing loss.

Patient Education:

- Educate on the importance of completing the full course of antibiotics.
- Advise on vaccination (e.g., meningococcal, pneumococcal vaccines).
- Teach to report symptoms like fever, headache, or neck stiffness immediately.

6.3.1.2. Encephalitis

Definition: Encephalitis is the inflammation of the brain, often caused by viral infections, leading to neurological dysfunction.

Causes:

- Viruses: Herpes simplex virus (HSV), West Nile virus, enteroviruses.
- Rarely bacterial, fungal, or autoimmune causes.

Symptoms:

- Fever, headache, confusion, and altered LOC.
- Seizures, motor weakness, or paralysis.
- Speech or hearing difficulties, photophobia.
- Severe cases may lead to coma.

Nursing Assessment:

- Assess neurological status (GCS, pupil response, motor function).
- Monitor for fever and signs of increased ICP.
- Observe for behavioral changes or seizures.

Nursing Interventions:

- **Supportive Care**: Maintain airway, breathing, and circulation (ABCs).
- **Antiviral Therapy**: Administer acyclovir for HSV encephalitis as prescribed.
- **Seizure Management**: Administer anticonvulsants (e.g., phenytoin) and ensure a safe environment.
- **Reduce ICP**: Elevate the head of the bed, monitor for signs of herniation (e.g., Cushing's triad: bradycardia, hypertension, irregular breathing).
- **Hydration and Nutrition**: Provide IV fluids and monitor for swallowing difficulties.
- **Monitor Complications**: Watch for cerebral edema or long-term neurological deficits.

Patient Education:

- Teach about mosquito bite prevention (e.g., insect repellent, long sleeves) for arbovirus-related encephalitis.
- Educate on recognizing early symptoms (fever, headache) for prompt treatment.
- Discuss potential long-term effects like memory loss or motor deficits.

6.3.1.3. Tetanus

Definition: Tetanus (lockjaw) is a bacterial infection caused by *Clostridium tetani*, leading to muscle spasms and rigidity due to the neurotoxin tetanospasmin.

Causes:

- Entry of *C. tetani* through puncture wounds, burns, or contaminated injuries.
- Poor wound hygiene or lack of immunization.

Symptoms:

- Muscle stiffness (starting in the jaw—lockjaw).
- Painful muscle spasms (often triggered by stimuli like noise or touch).
- Difficulty swallowing, fever, sweating.
- Severe cases: Opisthotonos (severe arching of the back), respiratory failure.

Nursing Assessment:

- Assess wound history and immunization status.
- Monitor for muscle rigidity, spasms, and respiratory distress.
- Check vital signs for signs of autonomic dysfunction (e.g., tachycardia, hypertension).

Nursing Interventions:

- **Wound Care**: Clean and debride the wound to remove the source of infection.

- **Tetanus Immunoglobulin (TIG)**: Administer TIG to neutralize the toxin.
- **Antibiotics**: Give metronidazole or penicillin to eradicate the bacteria.
- **Muscle Spasm Management**: Administer muscle relaxants (e.g., diazepam) and keep the environment quiet and dark to reduce stimuli.
- **Respiratory Support**: Monitor for airway obstruction; be prepared for intubation or tracheostomy if needed.
- **Immunization**: Administer tetanus toxoid to prevent future infections.

Patient Education:

- Emphasize the importance of tetanus vaccination (DTP/DTaP) and booster shots every 10 years.
- Teach proper wound care and to seek medical attention for deep or dirty wounds.
- Educate on recognizing early symptoms like jaw stiffness.

6.3.1.4. Poliomyelitis

Definition: Poliomyelitis (polio) is a viral infection caused by the poliovirus, affecting the motor neurons of the spinal cord, leading to paralysis.

Causes:

- Poliovirus (spread via fecal-oral route or contaminated water/food).
- Rare in vaccinated populations but still occurs in unvaccinated areas.

Symptoms:

- Asymptomatic in most cases.
- Symptomatic: Fever, fatigue, headache, vomiting.
- Severe cases: Muscle weakness, flaccid paralysis (often asymmetrical), respiratory failure.

Nursing Assessment:

- Assess for muscle weakness, paralysis, and respiratory function.
- Monitor for fever and signs of dehydration.
- Check for postural deformities or scoliosis in chronic cases.

Nursing Interventions:

- **Supportive Care**: Provide rest, hydration, and nutrition.
- **Pain Management**: Administer analgesics for muscle pain.
- **Respiratory Support**: Monitor breathing; provide mechanical ventilation if paralysis affects respiratory muscles.
- **Physical Therapy**: Initiate early physiotherapy to prevent contractures and promote mobility.
- **Prevent Secondary Infections**: Maintain hygiene to prevent urinary tract infections or pressure ulcers.
- **Monitor Complications**: Watch for post-polio syndrome (muscle weakness years later).

Patient Education:

- Stress the importance of polio vaccination (OPV/IPV).
- Educate on hygiene practices to prevent fecal-oral transmission.
- Teach about long-term rehabilitation and the use of assistive devices if paralysis persists.

6.3.1.5. Epilepsy

Definition: Epilepsy is a chronic neurological disorder characterized by recurrent, unprovoked seizures due to abnormal electrical activity in the brain.

Causes:

- Genetic factors, brain injury, infections (e.g., meningitis), stroke.
- Triggers: Stress, sleep deprivation, flashing lights, alcohol.

Symptoms:

- Generalized seizures (e.g., tonic-clonic: loss of consciousness, convulsions).
- Focal seizures (e.g., partial: altered sensation, repetitive movements).
- Aura (warning signs like unusual smells or sensations).
- Postictal state (confusion, fatigue after a seizure).

Nursing Assessment:

- Obtain a seizure history (frequency, triggers, duration).
- Assess neurological status during and after seizures.
- Monitor for injuries or respiratory distress during seizures.

Nursing Interventions:

- **Seizure Safety**: During a seizure, protect the head, remove nearby objects, place the patient on their side, and do not restrain.
- **Airway Management**: Ensure a patent airway; do not insert objects into the mouth.
- **Medication Adherence**: Administer anticonvulsants (e.g., levetiracetam, valproate) and monitor for side effects.
- **Monitor Seizure Activity**: Document the type, duration, and postictal state.
- **Prevent Triggers**: Advise on sleep hygiene, stress management, and avoiding alcohol.
- **Emergency Care**: Administer diazepam or lorazepam for status epilepticus (prolonged seizures).

Patient Education:

- Teach about medication adherence and potential side effects.
- Advise on avoiding triggers (e.g., flashing lights, sleep deprivation).
- Educate on safety measures (e.g., no swimming alone, wearing a medical alert bracelet).

6.3.1.6. Parkinson’s Disease

Definition: Parkinson’s disease (PD) is a progressive neurodegenerative disorder caused by the loss of dopamine-producing neurons in the substantia nigra, leading to motor and non-motor symptoms.

Causes:

- Idiopathic (exact cause unknown).
- Genetic predisposition, environmental toxins (e.g., pesticides).
- Aging is a major risk factor.

Symptoms:

- Tremors (resting tremor, often starting in one hand).
- Bradykinesia (slowness of movement), rigidity.
- Postural instability, shuffling gait.
- Non-motor: Depression, constipation, sleep disturbances.

Nursing Assessment:

- Assess motor symptoms (tremors, rigidity, bradykinesia).
- Monitor for non-motor symptoms (e.g., depression, cognitive decline).

- Evaluate for fall risk and activities of daily living (ADLs) impairment.

Nursing Interventions:

- **Medication Management**: Administer levodopa-carbidopa (converts to dopamine) and monitor for "on-off" phenomena.
- **Mobility Support**: Encourage physical therapy to improve gait and balance.
- **Fall Prevention**: Remove environmental hazards, use assistive devices (e.g., walker).
- **Nutrition**: Address swallowing difficulties (dysphagia); provide soft foods and thickened liquids.
- **Emotional Support**: Address depression or anxiety through counseling or antidepressants.
- **Monitor Complications**: Watch for dyskinesia (involuntary movements) due to long-term medication use.

Patient Education:

- Educate on the importance of taking medications on time to avoid "off" periods.
- Teach about exercises to maintain mobility and prevent falls.
- Discuss the progressive nature of PD and the need for regular follow-ups.

6.3.1.7. Spinal Cord Injury

Definition: Spinal cord injury (SCI) refers to damage to the spinal cord, resulting in partial or complete loss of motor and sensory function below the level of injury.

Causes:

- Trauma (e.g., motor vehicle accidents, falls).
- Non-traumatic (e.g., tumors, infections, ischemia).

Symptoms:

- Paralysis (quadriplegia or paraplegia, depending on injury level).
- Loss of sensation, bowel/bladder dysfunction.
- Spasticity, neuropathic pain.
- Respiratory issues (if cervical injury).

Nursing Assessment:

- Assess the level and extent of injury (e.g., C4 injury affects breathing).
- Monitor for autonomic dysreflexia (sudden hypertension, headache, sweating).
- Check for pressure ulcers, deep vein thrombosis (DVT), or infections.

Nursing Interventions:

- **Immobilization**: Maintain spinal alignment with a cervical collar or brace.
- **Respiratory Care**: Monitor for respiratory compromise; provide suctioning or ventilatory support if needed.
- **Skin Care**: Reposition every 2 hours to prevent pressure ulcers; use pressure-relieving mattresses.
- **Bladder/Bowel Management**: Implement intermittent catheterization and bowel training programs.
- **Pain Management**: Administer analgesics or antispasmodics for neuropathic pain or spasticity.
- **Rehabilitation**: Collaborate with physical and occupational therapists for mobility and ADLs training.
- **Monitor Complications**: Watch for DVT (use compression stockings), infections, or autonomic dysreflexia.

Patient Education:

- Teach about skin care and the importance of repositioning.

- Educate on bladder and bowel management techniques.
- Discuss long-term rehabilitation and the use of assistive devices (e.g., wheelchair).

6.3.1.8. Head Injury

Definition: Head injury refers to trauma to the scalp, skull, or brain, ranging from mild (concussion) to severe (traumatic brain injury, TBI).

Causes:

- Falls, motor vehicle accidents, sports injuries.
- Assaults or penetrating injuries (e.g., gunshot wounds).

Symptoms:

- Mild: Headache, confusion, dizziness, nausea (concussion).
- Severe: Loss of consciousness, seizures, vomiting, unequal pupils.
- Signs of increased ICP: Cushing's triad, altered LOC, papilledema.

Nursing Assessment:

- Assess neurological status using GCS (score <8 indicates severe injury).
- Monitor for signs of increased ICP (e.g., headache, vomiting, bradycardia).
- Check for cerebrospinal fluid (CSF) leakage (otorrhea, rhinorrhea) or Battle's sign (bruising behind ears).

Nursing Interventions:

- **Airway Management**: Ensure a patent airway; suction as needed.
- **Monitor ICP**: Elevate the head of the bed to 30 degrees, avoid neck flexion, and administer osmotic diuretics (e.g., mannitol) if prescribed.
- **Seizure Precautions**: Keep side rails up and have emergency medications ready.
- **Control Bleeding**: Apply pressure to scalp lacerations; avoid removing penetrating objects.
- **Neurological Monitoring**: Perform frequent neuro checks (pupil size, LOC, motor response).
- **Prevent Secondary Injury**: Maintain oxygenation, control blood pressure, and avoid hypothermia.
- **Surgical Intervention**: Prepare for craniotomy or hematoma evacuation if indicated.

Patient Education:

- Educate on recognizing signs of worsening (e.g., severe headache, vomiting, confusion).
- Advise on rest and avoiding activities that risk further injury (e.g., sports) during recovery.
- Teach about potential long-term effects (e.g., post-concussion syndrome, cognitive deficits).

General Nursing Considerations for Neurological Conditions

- **Infection Control**: Maintain strict asepsis during procedures (e.g., lumbar puncture, wound care).
- **Family Support**: Involve the family in care planning and provide emotional support.
- **Multidisciplinary Approach**: Collaborate with neurologists, physical therapists, and social workers for holistic care.
- **Documentation**: Accurately document all assessments, interventions, and patient responses.

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