Adult Nursing Ⅱ
Nursing management of patients with nervous system disorder: Meningitis

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Meningitis: Definition

- Inflammation/ infection of the meningeal coverings of the brain and spinal cord

Meningitis:
Causative Organisms

- Viral (aseptic)
- Bacterial (septic)
- Fungal
- TB

Bacteria Causing Meningitis

- Meningococcus/ Neirissia meningitidis*
- Haemophilus influenzae (HIB)*
- Streptococcus pneumoniae (Pneumococcus)
- Staphylococcus pneumoniae

- ** gram negative*

Meningitis:
Entry of Pathogens

- Haemogenous (via blood circulation) following an infection usually of the upper respiratory tract (nasopharynx, mastoid, otitis media) (original droplet infection)
- Trauma (head injury) or neurosurgery
- Opportunistic infection in an immuno-compromised patient (Pneumococcus and fungal mainly)

Meningitis:
Transmission of Infection

- Direct contact
- Droplet from “carriers”

- Organisms are usually present in the nasopharynx. Most people are “carriers” but do not succumb to infection as have adequate immune response

Meningitis: Pathophysiology

- Upper respiratory tract infection → septicaemia → meningeal and CSF
- Inflammation of underlying cortex → small thrombi and reduced cerebral blood flow
- Generalised septicaemia vasculitis and vascular necrosis (Meningococcal)
- Purulent meningeal exudate within CSF and ventricles →

Meningitis: Pathophysiology (cont)

- <u>Altered intra-cranial physiology:</u>
- ↑ permeability of blood-brain barrier
- Cerebral oedema
- ↑ intra-cranial pressure
- Possible blockage and lack of absorption of CSF by villi → hydrocephalus
- Gram negative endotoxins can cause septic shock and multi-system failure

Meningitis: Prognosis

- Prognosis depends on:
- How quickly treated
- How severe the infection
- Can lead to death within a few hours

Meningitis: Complications

- Deafness
- Visual impairment
- Seizures
- Paralysis
- Amputation of a limb
- Hydrocephalus
- Septic shock
- DIC

Meningitis: Clinical Manifestations (Meningeal Irritation)

- Severe headache
- Pyrexia (high fever throughout illness)
- Altered level of consciousness (maybe coma)
- Nuchal rigidity (neck spasm)
- Photophobia
- May have focal seizures
- Rash: purpura do not blanche on pressure

Meningitis: Diagnosis

- History and clinical picture
- Positive Kernig's and Brudzinski's signs
- Skin purpura which do not blanche
- Lumbar puncture:
- CSF culture of micro-organisms
- CSF pressure
- Blood culture, CBC, ESR, CRP,throatswab
- Brain CT / MRI (exclude hydrocephalus)

Meningitis: Acute Management

- Quiet darkened room, minimal handling
- Intrathecal antibiotics (via lumbar puncture)
- IV antibiotics
- Dexamethasone (↓ cerebral oedema)
- Anti-convulsant
- Osmotic diuretic (Mannitol)
- IV fluids and colloid volume expanders to correct hypotension in septic shock

Public Health Implications

- Since meningitis spreads by droplet infection, protect the public:
- Isolate until antibiotics established
- Prompt follow-up of contacts
- Passive immunisation and antibiotic course (Rifampicin) to contacts
- Current active prevention: HIB vaccination in infancy; anti-pneumococcal vaccine for immunocompromised (widely used now)

Meningitis: Nursing Considerations

- Respiratory isolation until 24 hours after antibiotic therapy
- Quiet, restful atmosphere (darkened if photophobic)
- Monitoring: GCS, vital signs, fluid balance
- Cool clean bedclothes
- Control pyrexia
- Support of family members