Poliomyelitis

Professor Priyantha Perera

Epidemiology

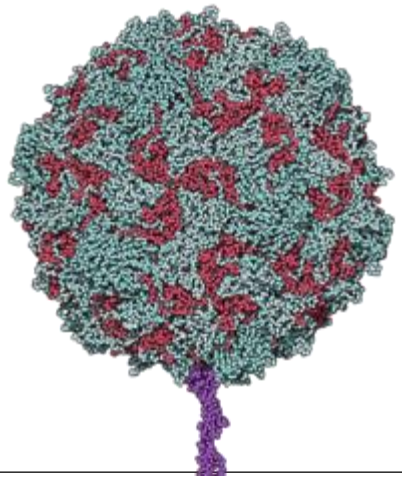
- Man is the main reservoir
- Occurred as epidemics
- Not common now due to vaccination
- Infections are limited to Afganistan, Nigeria and Pakistan
- Spreads by direct contact via infected persons through pharyngeal secretion and feces
- Last case from Sri Lanka in 1993, but not declared Polio free till 2014

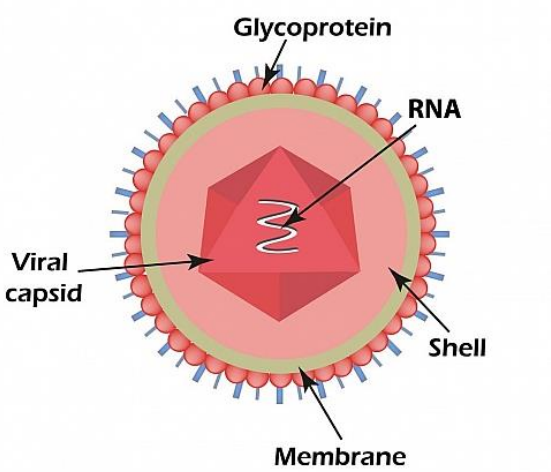
Epidemiology

- Oral- Oral and fecal- oral transmission
- Host factors like age, pregnancy, physical activity, IM injections, immunodeficiency increase the risk of paralysis
- Recent tonsillectomy increase the risk of bulbar poliomyelitis

Etiology

- Caused by a RNA viruses
- 3 different strains with minimal antigenic overlap
- Type 1 cause major epidemics and cause more paralysis and type 2 cause sporadic cases with less paralysis. Type 3 intermediate
- Worldwide type 2 has not caused Polio since 1999
- Last case due to type3 was reported in 2012
- Vaccine associated polio is mainly with type 2





pathogenesis

- Virus multiply in tonsillo- pharyngeal tissues and intestinal wall
- Virus rapidly disappear from pharyngeal secretions
- But continue to remain in intestines and excreted in feces for weeks and months
- Enter regional LN, and then to blood – viremia
- The mode of entry to CNS is not clear
- Cause direct cytopathic effect on neurons

Pathogenesis

- Anterior horn cells of the spinal cord is mainly affected but posterior and intermediate columns may also involved
- Cervical and lumbar-sacral expansions of the spinal cord are mainly involved
- Motor and pre-motor areas, cranial nerve nuclei in brain stem are also involved
- In some cases lesions are concentrated around medulla with minimal cord involvement (bulbar poliomyelitis)

Clinical features

- Highly infectious
- I P 1 – 3 Weeks
- Depending on host immunity and virulence of virus, infection will result in either
  - Minor illness

  or
  - Major illness

Minor illness

- May mimic a viral fever or viral gastro-enteritis

Major illness

- Non paralytic or pre-paralytic stage
- Paralytic poliomyelitis

Non paralytic or pre-paralytic stage

- This stage is seen after the minor illness
- Mimic a aseptic (Viral) meningitis
- In some children disease stops at this stage while in others it progresses to paralytic stage

Paralytic poliomyelitis

- Spinal poliomyelitis
- Bulbar poliomyelitis
- Balbo-spinal poliomyelitis

Spinal polio

- Mainly affects the spinal cord
- Cervical and lumbar-sacral areas mainly involved
- Involvement is asymmetrical and patchy
- Muscles innervated by involved neurons undergo paralysis
- Features of lower motor neuron lesions will be present
  - Facsiculations
  - Fibrilations
  - Areflexia
  - wsating

Spinal polio

- Some neurons recover resulting in improvement in muscle function during first four weeks
- Improvement thereafter is very slow - mainly through hypertrophy of surviving muscles

Bulbar polio

- Result in crainial nerve palsies
- Can involve respiratory center and circulatory centers

Clinical features

- Acute onset asymmetrical LMN (Flaccid) paralysis
- Involvement of respiratory muscles will cause respiratory failure
- Involvement of cranial nerves will cause bulbar palsy, with difficulty swallowing, aspiration, laryngeal involvement, external ocular palsies.
- Involvement of circulatory center will cause changes in pulse rhythm and blood pressure

DD

- Gullian barre syndrome
- Transverse myelitis
- Botulism
- Myasthenia gravis
- Other vireses like ECHO, Coxsakie and entero

Diagnosis

- Clinical
- Nerve conduction studies - normal
- EMG – Denervation hypesensitivity
- Viral isolation

Denervation activity including fibrillation potentials and positive sharp waves from the anterior tibial muscle with force zero

Management

- Send 2 stool samples for viral isolation
- Isolate the patient with proper stool disposal
- Notification
- Monitor respiratory functions for impending respiratory failure
- Anticipate respiratory failure /risk of aspiration and ventilate if necessary
- Antipyretics, Bed rest
- Avoid IM injections

Management

- Hydration and nutrition
- Monitor BP, Pulse
- Start physiotherapy once fever settle
- Rehabilitation

Prevention

- Vaccination

  Live

  Killed

Recent changes

- Now b-OPV is given instead of t OPV- type 2 removed
- 2 doses of IPV given ID to cover type 2

Vaccination Associated poliomyelitis

- Occurs in one in million doses
- Diagnostic criteria include

1. onset of paralysis within 4 – 40 days of vaccination
2. Isolation of vaccine strain of polio from stools
3. Paralysis lasting over 60 days
4. No other cause for paralysis