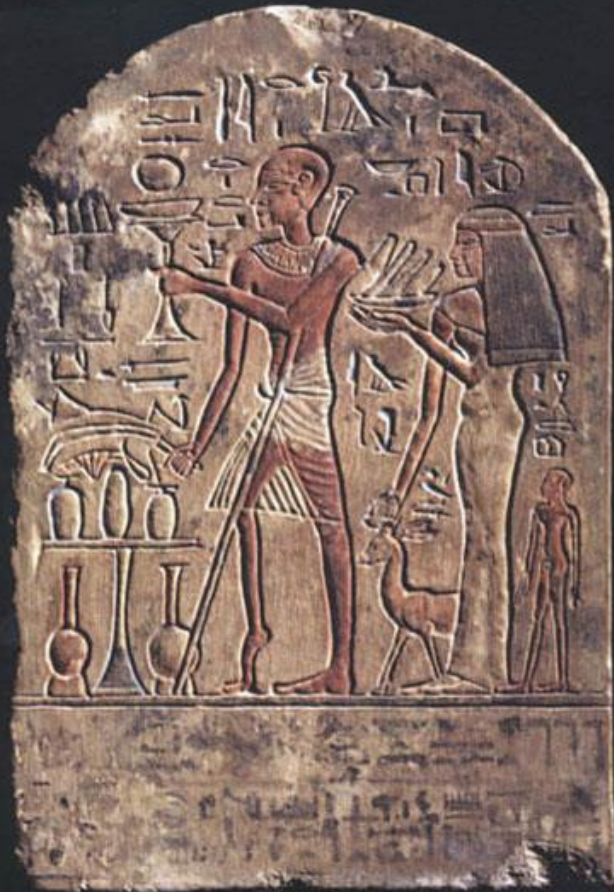


# Epidemiology of Poliomyelitis



## **Instructional Objectives:**

- 1- To Demonstrate the main clinical characteristics.
- 2- To point out the epidemiology of poliomyelitis.
- 3- To describe the main preventive & control measures of poliomyelitis.
- 4- To Define the WHO strategies of polio eradication.



## **poliomyelitis**

**Is a viral infection,**

**Starts in GIT,**

**(main mode of transmission?)**

**Initially to regional LN**

**and occasionally to CNS.**

# Causative agent :

Polio Enterovirus :

Type 1

2 & 3

↓  
☠ Paralytogenic

☠ Most frequent

☠ Cause of outbreak

- less common

- vaccine

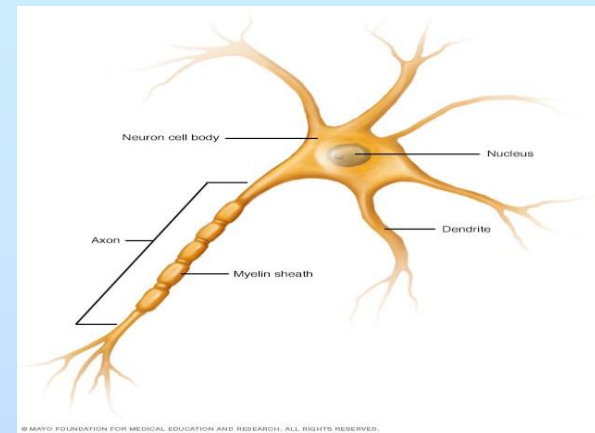
associated.

- Wild poliovirus type 2 was eradicated in 1999.
- Wild poliovirus type 3 was eradicated in 2020.
- Wild poliovirus type 1 restricted in 2 countries.

## Clinical Manifestation:

- **IP : 5-14 up 25 days**
- **80-90% of infections in apparent.**
- **In apparent to Paralytic polio is 200:1**
- **Can a symptomatic transmit the disease?**
- **10-20% .. Abortive and major illness ...**
- **Abortive polio (majority): Minor illness ...**  
(Non specific flu-like symptoms), 2-3 days.
- **Major illness (minority) .. Non paralytic polio,**  
**CNS symptoms ....**
- **Paralytic polio <1 % .....**

## Specific CNS symptoms:



- Aseptic meningitis ( **paralysis??**)
- Flaccid paralysis
- Trouble breathing and death (**5-10% of whom?**).

# Characteristics of paralytic polio:

- Asymmetrical
- Maximized within few days
- Residual paralysis, after 60 days, **WHY???**
- Site is depend on the location of lower motor neuron lesion.
- Flaccid paralysis, ↓↓ reflexes, intact sense
- Legs are affected more than arms
- Proximal parts more often than distal parts.

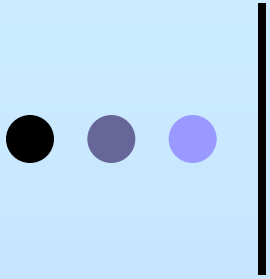
**Triggering interventions for AFP ???**

**Sex predominance?**

# *Epidemiology of polio*

## **Occurrence of polio ...**

- **Pre- vaccination era..** Global Endemic with annual epidemic.
- **Post- vaccination era .. Characteristics:**
- Disease Eradicated in west hemisphere..
- Reduction of polio cases by 99.9% in eastern..
- The poliovirus either:
  - ✓ The **Wild-type poliovirus..** Very limited.
  - ✓ The **Vaccine-derived poliovirus (VDPV)..** Widespread, in which countries??.
  - ✓ **In july 2022 a case of paralytic polio..??**



- *Does the attenuated virus in the oral vaccine itself cause polio??*
- *How??*
- *Failure to stop polio in the last remaining areas could result in global resurgence of the disease. How??*



# *Epidemiology of polio*

- *In Iraq: last outbreak was in 2014.*
- *In 2024 : Iraq complete the full polio transition process.*  
*What does this mean?*
- *Does Iraq still need to continue vaccination and why?*

## *Epidemiology of polio*

- ✓ **Susceptible Age?**
- ✓ **Can adults get polio?**
- ✓ **Whom?**
  
- **Period of communicability:**
- **6 wks from getting infection ....**
  - **Virus spreads by throat secretion (36 hrs- 1 wk) &**
  - **by feces (72 hrs-3-6 wks).**
  - **If immunocompromised patient???**

## Reservoir :

Human → patients.



Inapparent infections.

**Which is more frequent??**

**is a patient with a residual polio  
paralysis contagious??**

**Long term carriers?**

**Animal reservoir?**

## Mode of transmission:

### Direct transmission

#### ❖ Fecal –oral transmission

- poor sanitation.. contaminated water,  
Food ....
- Young children ...

#### ❖ Pharyngeal droplets

- good sanitation
- older age group

**Which one more common??**

#### ❖ Insects ???

# Prevention of polio:



## o Vaccination

(Iraq)

**Oral attenuated (OPV)**

**6 doses (0D, M2, M4,  
M6, M18, 4-6 yr)**

**Inactivated (IPV)**

**(M4, M6)**

# OPV (Sabin) 1961:

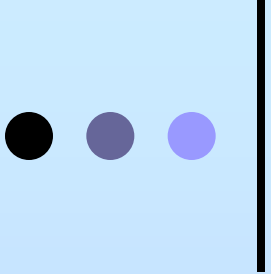


- Recommended by WHO for polio eradication &EPI...
- 3 doses will protect at least 80-85%.
- Induces both circulating antibody &intestinal immunity.
- Immunize some contacts through secondary spread
- **It is contraindicated in all immune deficient persons.**
- **Vaccine associated paralysis (VAP) 1:2,700,000 doses**
- **Lower level of serum antibodies .. Sometimes ..**

*Why??*

## IPV (Salk) 1955:

- **Serum Antibodies.**
- **No risk of vaccine associated paralysis (why?)**

- 
- **WHO, still recommend the usage of OPV in developing countries with low vaccine coverage rate??**

*Can OPV and IPV be given together?*

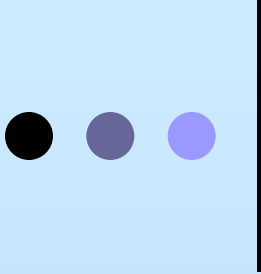
*WHY??*

*Does polio vaccines stop transmission of virus?*

*Which vaccine type can control the outbreak?*

*Why?*

*Immunity against polio for how long?*



# Can the polio vaccine be given to adults?

- YES .. Unvaccinated, incomplete vaccination..
  - Travelers to endemic area
  - Lab workers
  - Health care workers (for polio patients).

*Type and HOW??*



## **Control measures:**

- Reporting is obligatory..**
- Isolation ..**
- Concurrent disinfection**
- Protection of contacts ...**
- Inv of source**
- No Sp Rx**

## Polio Eradication opportunities :

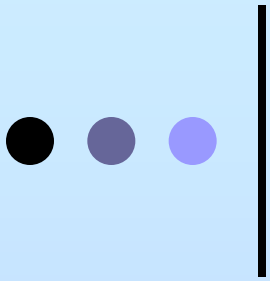
● ● ●  
Polio is one of only a limited number of diseases they can be eradicated

- ❖ Polio only affects human
- ❖ No animal or insect reservoir
- ❖ An effective vaccine is available
- ❖ Immunity is life long
- ❖ No long-term carriers
- ❖ Virus can only survive for a very short period in the environment

## Strategy of Eradication (2022-2026):

### *4 pillars of polio eradication*

- 💣 **High routine immunization coverage with OPV and IPV.**
- 💣 **Supplementary immunization in the form of mass campaigns or NIDs**
- 💣 **Effective surveillance??**
- 💣 **Mopping –up campaigns, door-to-door immunization, in remote areas, and low VC Rates.**



- **Effective AFP surveillance system:**

- Active surveillance of AFP <15 years
- Diagnosis as early as possible
- Two stool samples (24- 48 hours apart)
- Special kit, deep freeze, sent to central lab
- Then there should be a 60<sup>th</sup> day exam. (Residual paralysis)