

Assignment #1

Hajra Sarfraz

Batch 59

Rollno 32405

Topic: Polio: Symptoms, Causes, treatment & Prevention.

Poliomyelitis:-

Poliomyelitis, most commonly known as polio, is an infectious disease caused by polio virus which affects the motor neurons in brain and spinal cord. It can cause paralysis of legs and arms, and if it affects the muscles of diaphragm it may cause death.

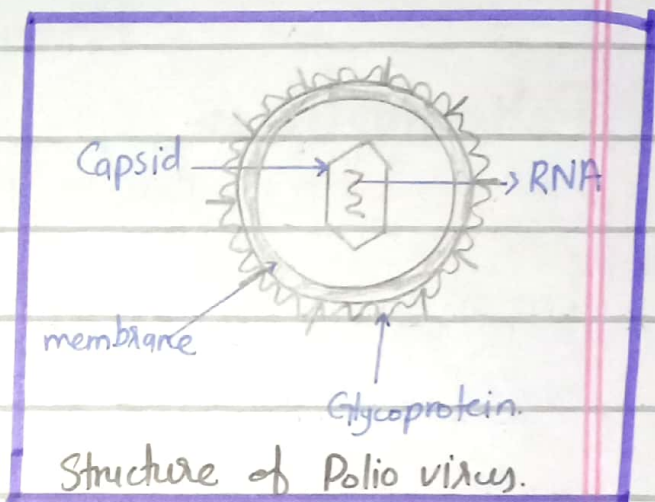
Symptoms:-

90-95% people infected by polio virus ~~people~~ does not show symptoms. 5-10% people show mild symptoms like fatigue, fever, headache, throat pain, abdominal pain, nausea and vomiting. While 0.5% people show sever symptoms such as muscle weakness, paresthesia (feelings of pins & needles in the legs), paralysis and floppy limbs.

Causes:-

Poliomyelitis is caused by Polio virus which is a non-enveloped ss RNA virus. It has three serotypes PV1, PV2, PV3.

PV2 and PV3 are completely eradicated, only PV1 exists now.



Mechanism of Action:- Polio virus enters into the mouth and moves down into the throat where it replicates. It moves down further into the stomach and intestine, where it makes more and more copies and then excretes out of the body in stool. If it succeeds in entering into the blood, our immune system fights with it and kills it if immunity is strong. This fight ^{between} virus and immune cells cause the mild symptoms. But if the virus enters and becomes able to enter into the central nervous system,

it affects the motor neurons in Brainstem and spinal cord. It ~~can~~ damages the cell bodies of motor neurons in grey matter. As the motor neurons damaged, no electrical impulse goes to muscles and activity of muscles reduced. The process is rapid and cause complete paralysis of muscles. If it affects the muscles of diaphragm, breathing will be difficult, and patient will died ultimately.

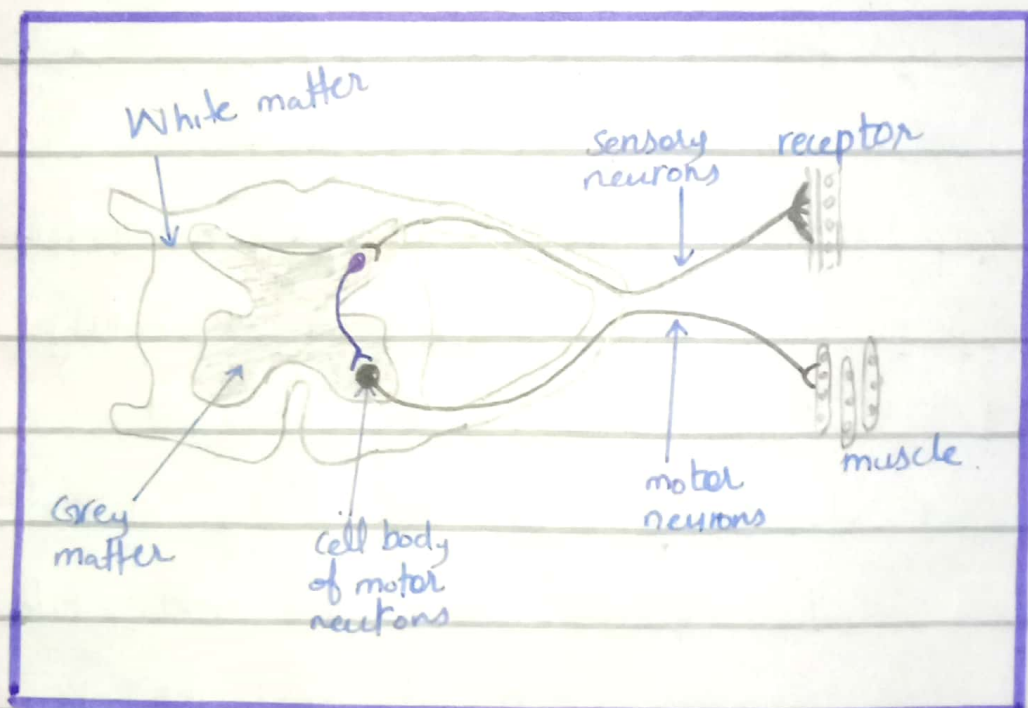


Diagram showing linkage ^{between} ~~to~~ nervous system and muscles through motor neurons.

Mode of Transmission:- It is transmitted through two routes:-

- ① Fecal to oral route
- ② Oral to oral route

Diagnosis & Treatment:-

Diagnosis :- Polio is diagnosed by symptoms and lab tests. There are three types of lab tests are done including throat culture, stool culture and cerebrospinal fluid culture.

Treatment:- There is not a specific treatment for polio. However, supportive care is provided to reduce the pain and symptoms. Supportive care includes:-

① Rest

② Fluids

③ Iron lung/ventilators

④ Pain medication

Iron lung, was a device, ^{invented} in 20th century used for patients with damaged muscles of diaphragm. Iron lung was a closed device which covers the ~~total~~ whole body except face. It changes the pressure level and allow the diaphragm to expand and keep breathing. Now, it has been replaced by ventilators.

Prevention:-

The major preventive measure is vaccination which protects human from virus by inducing immunity. There are two types of vaccinations available for polio:

① Sabin

② Salk.

Sabin

Salk

① It uses live, attenuated virus.

② ^{Its} 3 doses give 95% protection.

③ It is oral vaccine and given orally.

④ It provides humoral as well as cell-mediated immunity.

⑤ 1 out of 2.5 million people can get virulent form of virus and suffer from polio.

It uses killed form of virus

Its 1 dose provides 90% while 3 doses provide 99% protection.

It is intramuscular vaccine which is injected into muscles of leg or arm.

It provides only humoral immunity.

The virus cannot be virulent as it is dead.

Other preventive measures:-

Polio spread in areas of crowding, poor hygiene and sanitation. That is why, we can prevent it by

- increasing sanitation standard
- surveillance.

Polio Free World

The world aims to eradicate the polio and to turn into Polio-free world. By 1994, Americas were free of polio. Now America, Europe and Western Pacific completely eradicated the virus. As reported ^{by} WHO in 2014, only 3 countries have polio cases including Pakistan, Afghanistan and Nigeria. By implementing the preventive measures, we can get rid of polio.