Assignment #1

Hajra Sarfraz

Batch 59

Rollno 32405

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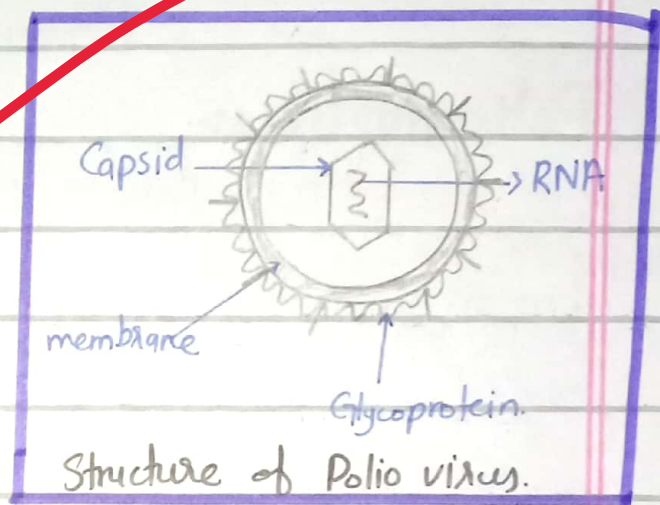
Poliomyelitis:-

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 flobby limbs.

Causes:-

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

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

Structure of Polio virus.

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

motor neurons in Brainstem and spinal cord. It ᵐ damages the ⁿ 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.
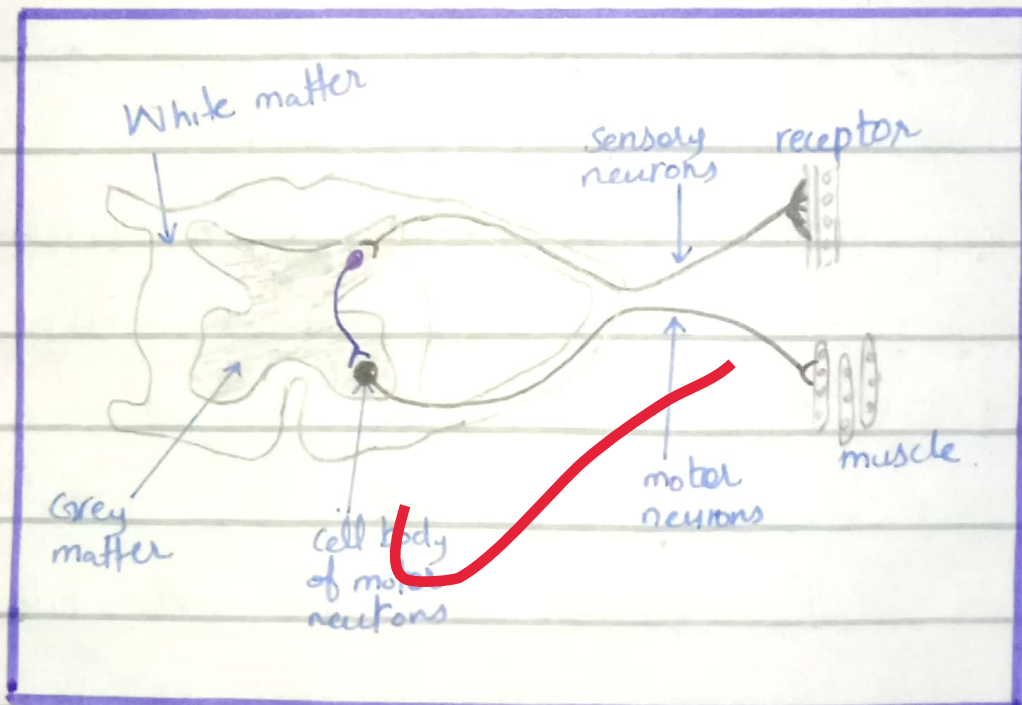

White matter

Grey matter

cell body of mot neutrons

sensory neurons

motor neurons

receptor

muscle

Diagram showing linkage between b/w 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/ventillators   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 hold 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.	It uses killed form of virus
Its ② 3 doses give 95% protection.	Its 1 dose provides 90% while 3 doses provide 99% protection.
③ It is oral. vaccine and given orally	It is intramuscular vaccine which is injected into muscles of leg or arm.
④ It provides humoral as well as cell - mediated immunity.	It provides only humoral immunity.
⑤ 1 out 2.5 million people can get virulent form of virus and suffer from polio.	The virus cannot be virulent as it is dead.

Other preventive measures:-

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

- increasing sanitation standard
- survellience.

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 westren Pacific completely eradicated the virus. As reported to 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.