

GSA assignment

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Malaria/Typhoid/Dengue/ Hepatitis/

Polio;-

Definitions;

Symptoms;

Causal Agents;

General causes;

Treatment;

Preventive measures.

Malaria

Malaria is caused by Plasmodium parasites. The parasite spread to people through the bites of infected female Anopheles mosquitoes, called "malaria vectors".

According to WHO estimates, released in December 2015, there were 214 million cases of malaria in 2015 and 438000 deaths.

Symptoms of Malaria:

Malaria is an acute feverish illness. In a non-immune individual, symptoms appear 7 days or more after the infective mosquito bite.

The first symptoms - fever, headache, chills and vomiting - may be mild and difficult to recognize as malaria.

Children with severe malaria frequently develop one or more of the following symptoms: severe anaemia, respiratory distress in relation to metabolic acidosis, or cerebral malaria. In adults, multi-organ involvement is also frequent.

Causal Agents:

- Plasmodium falciparum
- Plasmodium vivax
- Plasmodium ovale
- Plasmodium malariae
- Plasmodium knowlesi

Two of these species *P. falciparum* and *P. vivax* pose the greatest threat. *P. falciparum* is responsible for most malaria related deaths globally.

P. vivax is the dominant malaria parasite in most countries outside of sub-Saharan Africa.

General causes:

Bites from infected Anopheles mosquitoes. If the person they bite is infected with plasmodium, they will take up some of the pathogen's gametes with the blood meal. The female Anopheles mosquito is therefore a vector of malaria and she transmits the disease when she passes the infective stages into an uninfected person.

Preventive measures:

vector control is the main way to prevent and reduce malaria transmission. "WHO recommends protection for all people at risk of malaria with effective malaria vector control."

Two forms of vector control:

- i- Insecticide treated mosquito net
 - ii- Indoor residual spraying
- are effective in a wide range of circumstances.

Antimalaria medicines can also be used to prevent malaria. For travellers, malaria can be prevented through chemoprophylaxis.

Treatment:

Treatment should be started as soon as the diagnosis has been confirmed.

The best available treatment, for *P. falciparum* malaria, is artemisinin-based combination therapy (ACT).

Anti-malarial medication is used both to treat and prevent malaria.

There are currently no licensed vaccines against malaria or any other human parasite.

Typhoid

Typhoid fever is a serious bacterial infection caused by the bacterium *Salmonella typhi*. It is a life threatening illness that primarily affects the gastrointestinal system and can spread throughout the body, leading to severe complications if untreated.

Symptoms:

The symptoms of typhoid fever typically develop one to three weeks after exposure and include prolonged high fever, weakness, fatigue, stomach pains, headache, and loss of appetite. Some individuals may also experience a rash, known as "rose spots", on the abdomen and chest.

Causal Agents:

Typhoid fever is caused by the bacterium *Salmonella enterica* serotype *Typhi*. This pathogen is specifically adapted to humans and spread through contaminated food and water.

General Causes:

The primary causes of typhoid fever include consumption of food or water

contaminated with the feces of an infected person. This contamination is often due to poor sanitation and hygiene practices, such as inadequate handwashing, improper sewage disposal, and the use of contaminated water for drinking or cooking.

Preventive Measures:

This includes drinking safe, treated water, practicing proper hand hygiene and ensuring food is properly cooked and stored. Vaccination is also an effective preventive strategy, especially for travellers to areas where typhoid fever is endemic.

There are two types of vaccines available, are the oral live attenuated vaccine and injectable polysaccharide vaccine.

Treatment:

Treatment for typhoid fever involves the use of antibiotics, such as ciprofloxacin, azithromycin or ceftriaxone to eliminate the infection. In addition to antibiotic therapy, supportive care, including hydration and adequate nutrition is essential to manage symptoms and aid recovery.

Dengue

Dengue is a mosquito-borne viral disease that has rapidly spread in all regions in recent years. Dengue is widespread throughout the tropics, with local variations in risk influenced by rainfall, temperature and unplanned rapid urbanization.

"Severe dengue was first recognized in the 1950s during dengue epidemics in the Philippines and Thailand."

Symptoms:

Dengue fever is a severe, flu-like illness that affects infants, young children and adults, but seldom causes death.

Dengue should be suspected when a high fever is accompanied by 2 of the following symptoms: severe headache, pain behind the eye, muscle and joint pains, nausea, vomiting, swollen glands or rash.

Severe dengue is a potentially deadly complication due to plasma leaking, fluid accumulation, respiratory distress, severe bleeding or organ impairment.

Causal Agents:

There are four distinct, but closely related, serotypes of the virus that cause dengue (DEN-1, DEN-2, DEN-3, and DEN-4). Recovery from infection by one provides lifelong immunity against that particular serotype.

General Causes:

The *Aedes aegypti* mosquito is the primary vector of dengue. The virus is transmitted to humans through the bites of infected female mosquitoes. After virus incubation for 4-10 days, an infected mosquito is capable of transmitting the virus for the rest of its life.

Preventive Measures:

At present, the main method to control or prevent the transmission of dengue virus is to combat vector mosquitoes through:

- Preventing mosquitoes from accessing egg-laying habitats by environmental management and modification;
- Disposing of solid waste properly and removing artificial man-made habitats.
- Applying appropriate insecticides to water storage outdoor containers.

- using of personal household protection such as window screens, long-sleeved clothes, insecticide treated materials, coils and vaporizers.

Treatment:

There is no specific antiviral treatment.

- Active monitoring and surveillance of vectors should be carried out to determine effectiveness of control interventions.
- Supportive care with fluids and pain relief.

Hepatitis

Hepatitis is an inflammation of the liver that can result from various infectious and non-infectious causes. The most common forms are viral hepatitis, which includes hepatitis A, B, C, D, and E, each caused by a different virus. This inflammation can lead to severe liver damage, liver cancer, or liver failure if left untreated.

Symptoms:

The symptoms of hepatitis can range from mild to severe and often include jaundice, fatigue, abdominal pain, loss of appetite, nausea, vomiting, dark urine, and pale stool. In chronic cases, particularly with hepatitis B and C, symptoms may not appear until significant liver damage has occurred.

Causal Agents:

Hepatitis is caused by several viruses: hepatitis A virus (HAV), hepatitis B virus (HBV), hepatitis C virus (HCV), hepatitis D virus (HDV) and hepatitis E virus (HEV).

These viruses are the primary agents responsible for viral hepatitis, each transmitted through different routes.

and with varying severity and progression.

General Causes:

The general causes of hepatitis differ based on the type of virus. Hepatitis A and E are usually transmitted through ingestion of contaminated food or water.

Hepatitis B, C, and D are primarily spread through contact with infected blood or bodily fluids, which occur through sharing needles, unscreened blood transfusions, sexual contact and from mother to child during child birth.

Non-viral causes include excessive alcohol consumption, certain medication, and autoimmune diseases.

Preventive Measures:

Preventive measures for hepatitis include vaccination, safe drinking water, proper sanitation and hygiene practices.

Regular public health efforts, such as vaccination programs and education on safe practices, are vital in preventing the spread of hepatitis. Vaccines are available for hepatitis A and B, which also indirectly protect against hepatitis D.

Treatment:

Treatment for hepatitis depends on the type and severity of the infection. Hepatitis A and E typically do not require specific antiviral treatment and are managed with supportive care, including rest, hydration and proper nutrition.

Chronic hepatitis B is often treated with medications like tenofovir or entecavir, while hepatitis C^{can} often be cured with direct-acting antivirals (DAAs).

Polio

Polio (poliomyelitis), is a highly contagious viral disease caused by the poliovirus. It primarily affects children under five years of age and can lead to irreversible paralysis. In severe cases, the virus attacks the nervous system, causing permanent disability or even death.

Symptoms:

The symptoms of polio can vary widely. While many individuals infected with poliovirus are asymptomatic, about 1 in 4 people experience flu-like symptoms such as fever, fatigue, headache, vomiting, stiffness in the neck, and pain in the limbs.

In a small percentage of cases, the virus causes paralysis, which is often permanent.

Causal Agents:

Polio is caused by the poliovirus, which is a member of the Enterovirus genus within the Picornaviridae family. There are three serotypes of poliovirus:

type 1 (PV1), type 2 (PV2) and type 3 (PV3).

Each serotype can cause paralysis.

General causes:

Polio is primarily transmitted through the fecal-oral route, which means that the virus is spread through ingestion of food or water contaminated with the feces of an infected person. It can also be spread through oral transmission via saliva.

Preventive Measures:

Preventive measures for polio revolve around vaccination and improving hygiene. The two types of vaccines are the inactivated poliovirus vaccine (IPV) and the oral poliovirus vaccine (OPV).

IPV is administered via injection and provides systemic immunity, while OPV is administered orally and provides both systemic and intestinal immunity.

Treatment:

There is no cure for polio; treatment focuses on managing symptoms and preventing complications. Supportive care includes pain relief, physical therapy to prevent deformities and improve muscle function, and mechanical ventilation if breathing muscles are affected.