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Malaria: A life threatening disease

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Abstract: **The word malaria comes from 18th century Italian mala meaning bad and aria meaning air. Most likely, the term was first used by Dr. Francisco Torti, Italy, when people thought the disease was caused by foul air in marshy areas. It was not until 1880 that scientists discovered that malaria was a parasitic disease which is transmitted by the anopheles mosquito. The mosquito infects the host with a one-cell parasite called plasmodium.**

Keywords: **Malaria, disease, parasite, chloroquine, Plasmodium falciparum.**

I. INTRODUCTION

Malaria is transmitted exclusively through the bites of mosquitoes. This bite introduces the parasites from the mosquito's saliva into a person's blood. The parasites then migrate to the liver where they mature and reproduce. There are more than 100 species of Plasmodium, which can infect many animal species such as reptiles, birds, and various mammals. Four species of Plasmodium have long been recognized to infect humans in nature. In addition there is one species that naturally infects macaques which has recently been recognized to be a cause of zoonotic malaria in humans.

There are some additional species which can, exceptionally or under experimental conditions, infect humans. Charles Louis Alphonse Laveran, a French army surgeon stationed in Constantine, Algeria, was the first to notice parasites in the blood of a patient suffering from malaria. This occurred on the 6th of November 1880. For his discovery, Laveran was awarded the Nobel Prize in 1907. Previously, the common line of treatment for malaria was to administer the drug chloroquine [1-5]. The main ingredient in all anti-malarial drugs is an extract from a plant called Qinghaosu that produces. Chemically, artemisinin is a sesquiterpene lactone containing an unusual peroxide bridge. This peroxide is believed to be responsible for the drug's mechanism of action [6-11].

II. METHODS

Information has been collected through literature review, online search and discussion.

Symptoms:

Malaria infections are characterized by fever, headache, muscle ache, chills, fatigue, and vomiting usually appearing 7 to 15 days after being bitten by an infected mosquito. In cases with P. vivax and P. ovale, relapses may occur weeks or months after being infected. P. falciparum symptoms are more severe and include behavioural changes, confusion, seizures, anemia, respiratory failure, kidney failure, coma and shock. If not treated immediately, P. falciparum malaria can lead to death. Treatment includes artemisinincombination therapy (ACT) and supportive care of symptoms.

Prevention:

There are a number of options that travellers can take to prevent malaria, including antimalarial medication, using anti-mosquito sprays or lotions, and sleeping under a permethrin-treated bed net. For complete protection guidelines, medication contraindications and alternatives, as well as the geographic distribution of the infection. Awareness of malaria and the importance of control measures have been successfully used to reduce the incidence of malaria in some areas of the developing world. Awareness of malaria also inform people to cover over areas of stagnant, still water, such as water tanks that are ideal breeding grounds for the parasite and mosquito, thus cutting down the risk of the transmission between people.

Liver dysfunction:

Plasmodium vivax, Plasmodium malariae, Plasmodium ovale, plasmodium falciparum and plasmodium knowlesi are the different species of malaria. These species are introduced into the human blood stream through the bite of an infected mosquito; the life stage of malaria at this point is called a "sporozoite", and they pass first to the liver, where they undergo an initial stage of replication, before passing back into the blood and invading red blood cells. The malaria parasites that invade red blood cells are known as merozoites, and within the cell they replicate again, bursting out once they have completed a set number of divisions. It is this periodic rupturing of the red blood cells that causes most of the symptoms associated with malaria, as the host's immune system responds to the waste products produced by the malaria parasites and the debris from the destroyed red blood cells. Parasitized red blood cells become sequestered in small blood vessels and association between high parasitized red blood cells load in the livers of malaria patients with jaundice, hepatomegaly and liver enzyme elevation.

Diagnosis:

Malaria must be recognized promptly in order to treat the patient in time and to prevent further spread of infection in the community via local mosquitoes. Malaria should be considered a potential medical emergency and should be treated accordingly. Delay in diagnosis and treatment is a leading cause of death in malaria patients.

Eradication effort:

Attempts are being made to eradicate the parasite worldwide. The Organization, Malaria No More in 2006 set a public goal for the elimination of malaria from Africa by 2015, and plans to dissolve after accomplishment of the goal. Vaccines for several malaria are in clinical trials, which are intended to provide protection for children in endemic areas and reduce the speed of transmission of the disease. The latest research towards the eradication of malaria, scientists developed a method that can affect the pathogen's ability to be transmitted from one host to another [12-14].

Treatment of malaria:

Previously, the common line of treatment for malaria was to administer the drug chloroquine. Chloroquine was discovered by a German, Hans Andersag, in 1934 at Bayer I.G. Farbenindustrie A.G. laboratories in Eberfeld, Germany. He named his compound resochin. Through a series of lapses and confusion brought about during the war, chloroquine was finally recognized and established as an effective and safe antimalarial in 1946 by British and U.S. scientists. But over the years it has been found that the drug was ineffective against Plasmodium Falciparum – the plasmodium that causes falciparum malaria. This plasmodium has more or less developed a resistance to the drug rendering it ineffective – leading to the breed of cholorquine-resistant mosquitoes that cause multi-drug resistant malaria. The main ingredient in all antimalarial drugs is an extract from a plant called Qinghaosu that produces. Artemisinin, also known as Qinghaosu, and its derivatives are a group of drugs that possess the most rapid action of all current drugs against Plasmodium falciparum malaria. Treatments containing an artemisinin derivative are now standard treatment worldwide for P. falciparum malaria. Artemisinin is isolated from the plant Artemisia annua, sweet wormwood, a herb employed in Chinese traditional medicine. It can now also be produced using genetically engineered yeast. Chemically, artemisinin is a sesquiterpene lactone containing an unusualperoxide bridge. This peroxide is believed to be responsible for the drug's mechanism of action. Few other natural compounds with such a peroxide bridge are known. The drug therapies being used in India include, using combination of drugs namely Artimisinin-based combination therapy, analogues of existing drugs (different and more potent forms of the drug) namely atovaquonone and proguanil and drug resistant reversers. Now a day Spiroindolones is used for the treatment of malaria. This drug has been found to have the potential to block the parasite's signalling pathway leading to its destruction at an early stage in the disease.

III. CONCLUSION

Malaria is a disease of poverty. The malaria parasites that invade red blood cells are known as merozoites, and within the cell they replicate again, bursting out once they have completed a set number of divisions. It is this periodic rupturing of the red blood cells that causes most of the symptoms associated with malaria.

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