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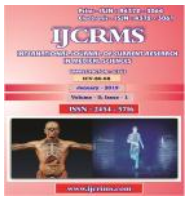

Review Article

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'A review of Filariasis'

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Abstract

Filariasis is a parasitic disease caused by an infection with roundworms of the Filarioidea type. These are spread by blood-feeding diptera as black flies and mosquitoes. This disease belongs to the group of diseases called helminthiases.

Eight known filarial nematodes use humans as their definitive hosts. These are divided into three groups according to the niche they occupy in the body:

Lymphatic filariasis, Subcutaneous filariasis, Serous cavity filariasis. World Health Assembly resolution WHA50.29 encourages Member States to eliminate lymphatic filariasis as a public health problem. In response, WHO launched its Global Programme to Eliminate Lymphatic Filariasis (GPELF) in 2000. In 2012, the WHO neglected tropical diseases roadmap reconfirmed the target date for achieving elimination by 2020.

Keywords: Introduction, Symptoms, Diagnosis, Treatment, Prevention, Prospects of elimination, Research teams, WHO's response, Conclusion.

Introduction

Filariasis is a disease group caused by filariae that affects humans and animals (ie, nematode parasites of the family Filariidae). Of the hundreds of described filarial parasites, only 8 species cause natural infections in humans. The World Health Organization (WHO) has identified lymphatic filariasis as a major cause of disability worldwide, with an estimated 40 million individuals affected by the disfiguring features of the disease.

In lymphatic filariasis, repeated episodes of inflammation and lymphedema lead to lymphatic damage, chronic swelling, and elephantiasis of the legs, arms, scrotum, vulva, and breasts.

Symptoms of Falaria:

Adult worms live in the lymph vessels and nodes, while the younger forms are found primarily in the blood. The symptoms are seen four to twelve months after infection, and usually begin with swelling and inflammation in the genitals or extremities. Other symptoms include fever, pain and swelling of lymph glands, headache, and inflammation of the lymph drainage areas,

swelling of the scrotum, skin rashes and blindness. Progression of the disease often causes enlargement of the legs resulting in a condition called elephantiasis or lymphatic filariasis. This enlargement occurs due to the presence of lymphoedema or presence of fluid in the tissue spaces that may begin to accumulate in the first 24 hours. The skin becomes thick and rough and the increase in the size and weight of the affected parts lead to disability.

Diagnosis:

Filariasis can be diagnosed by conducting a blood test that directly shows the presence of worms. Circulating filarial antigen is a standard test for diagnosing *Wuchereria bancrofti* infections.

Treatment:

The treatment of filariasis consists of using medicines that kill the worms combined with the treatment to relieve the symptoms. Diethylcarbamazine or ivermectin are effective drugs in the treatment of most filarial infections. Other drugs include albendazole and mebendazole. Antihistamines or corticosteroids can decrease allergic reactions.

-In case of elephantiasis, one needs to take a yearly dose of medicine that kills the microscopic worms in the blood. This does not kill the adult worms, but it does prevent transmission of the disease to other persons. Even after the adult worms die, swelling of arms, legs, breasts, or genitals, may be present. One may keep the swelling from getting worse by: Carefully washing the swollen area with soap and water everyday.

-Using anti-bacterial anti-fungal creams on the wound.
-Elevate and exercise the swollen arm or leg to move the retained fluid and improve lymph flow.
-Use compression bandages to reduce accumulation of fluid in the legs.

Prevention:

Prevention includes giving medicine that kills the microscopic worms, to the entire community in the areas where the infection is prevalent. Avoiding mosquito bites is another form of prevention. These mosquitoes usually bite between the hours of dusk and dawn. One can follow these steps, if living in an infected area: Sleep under a mosquito net. Use mosquito repellents on the exposed skin. Take a yearly dose of medicine that kills the worms in the blood.

Prospects for elimination:

Filarial diseases in humans offer prospects for elimination by means of vermicidal treatment. If the human link in the chain of infection can be broken, then notionally the disease could be wiped out in a season. In practice it is not quite so simple, and there are complications in that multiple species overlap in certain regions and double infections are common. This creates difficulties for routine mass treatment because people with onchocerciasis in particular react badly to treatment for lymphatic filariasis.

Research teams:

In 2015 William C. Campbell and Satoshi Ōmura were Co-awarded half of that year's Nobel prize in Physiology or Medicine for the discovery of the drug avermectin, which, in the further developed form ivermectin, has decreased the occurrence of lymphatic filariasis,

WHO's response:

Lymphatic filariasis impairs the lymphatic system and can lead to the abnormal enlargement of body parts, causing pain, severe disability and social stigma.

856 million people in 52 countries worldwide remain threatened by lymphatic filariasis and require preventive chemotherapy to stop the spread of this parasitic infection.

In 2000 over 120 million people were infected, with about 40 million disfigured and incapacitated by the disease.

Lymphatic filariasis can be eliminated by stopping the spread of infection through preventive chemotherapy with safe medicine combinations repeated annually for at least 5 years. More than 6.7 billion treatments have been delivered to stop the spread of infection since 2000.

499 million people no longer require preventive chemotherapy due to successful implementation of WHO strategies.

A basic, recommended package of care can alleviate suffering and prevent further disability among people living with disease caused by lymphatic filariasis.

Stopping the spread of infection through large-scale annual treatment of all eligible people in an area or region where infection is present; and alleviating the suffering caused by lymphatic filariasis through provision of the recommended basic package of care.

Cause and transmission:

Lymphatic filariasis is caused by infection with parasites classified as nematodes (roundworms) of the family Filariodidea. There are 3 types of these thread-like filarial worms:

Wuchereria bancrofti, which is responsible for 90% of the cases

Brugia malayi, which causes most of the remainder of the cases

Brugia timori, which also causes the disease.

Adult worms lodge in the lymphatic vessels and disrupt the normal function of the lymphatic system. The worms can live for approximately 6–8 years and, during their life time, produce millions of microfilariae (immature larvae) that circulate in the blood.

Mosquitoes are infected with microfilariae by ingesting blood when biting an infected host. Microfilariae mature into infective larvae within the mosquito. When infected mosquitoes bite people, mature parasite larvae are deposited on the skin from where they can enter the body. The larvae then migrate to the lymphatic vessels where they develop into adult worms, thus continuing a cycle of transmission.

Lymphatic filariasis is transmitted by different types of mosquitoes for example by the Culexmosquito, widespread across urban and semi-urban areas, Anopheles, mainly found in rural areas, and Aedes, mainly in endemic islands in the Pacific.

Symptoms:

Lymphatic filariasis infection involves asymptomatic, acute, and chronic conditions. The majority of infections are asymptomatic, showing no external signs of infection while contributing to transmission of the parasite. These asymptomatic infections still cause damage to the lymphatic system and the kidneys, and alter the body's immune system.

When lymphatic filariasis develops into chronic conditions it leads to lymphoedema (tissue swelling) or elephantiasis (skin/tissue thickening) of limbs and hydrocele (scrotal swelling). Involvement of breasts and genital organs is common. Such body deformities often lead to social stigma and sub-optimal mental health, loss of income-earning opportunities and increased medical expenses for patients and their caretakers. The socioeconomic burdens of isolation and poverty are immense.

Acute episodes of local inflammation involving skin, lymph nodes and lymphatic vessels often accompany chronic lymphoedema or elephantiasis. Some of these episodes are caused by the body's immune response to the parasite. Most are the result of secondary bacterial skin infection where normal defences have been partially lost due to underlying lymphatic damage. These acute attacks are debilitating, may last for weeks and are the primary cause of lost wages among people suffering with lymphatic filariasis. Large-scale treatment (preventive chemotherapy): Elimination of lymphatic filariasis is possible by stopping the spread of the infection through preventive chemotherapy. The WHO recommended preventive chemotherapy strategy for lymphatic filariasis elimination is mass drug administration (MDA). MDA involves administering an annual dose of medicines to the entire at-risk population. The medicines used have a limited effect on adult parasites but effectively reduce the density of microfilariae in the bloodstream and prevent the spread of parasites to mosquitoes.

The MDA regimen recommended depends on the co-endemicity of lymphatic filariasis with other filarial diseases. WHO recommends the following MDA regimens:

Albendazole (400 mg) alone twice per year for areas co-endemic with loiasis

Ivermectin (200 mcg/kg) with albendazole (400 mg) in countries with onchocerciasis

Diethylcarbamazine citrate (DEC) (6 mg/kg) and albendazole (400 mg) in countries without onchocerciasis

Recent evidence indicates that the combination of all three medicines can safely clear almost all microfilariae from the blood of infected people within a few weeks, as opposed to years using the routine two-medicine combination.

WHO now recommends the following MDA regimen in countries without onchocerciasis:

Ivermectin (200 mcg/kg) together with diethylcarbamazine citrate (DEC) (6 mg/kg) and albendazole (400 mg) in certain settings

The impact of MDA depends on the efficacy of the regimen and the coverage (proportion of total population ingesting the medicines). MDA with the two-medicine regimens have interrupted the transmission cycle when conducted annually for 4–6 years with effective coverage of the total population at risk. Salt fortified with DEC has also been used in a few unique settings to interrupt the transmission cycle.

At the start of GPELF, 81 countries were considered endemic for lymphatic filariasis. Further epidemiological data reviewed since, indicate that preventive chemotherapy was not required in 10 countries. From 2000 to 2016, 6.7 billion treatments were delivered to more

Morbidity management:

Morbidity management and disability prevention are vital for improving public health and are essential services that should be provided by the health care system to ensure sustainability. Surgery can alleviate most cases of hydrocele. Clinical severity and progression of the disease, including acute inflammatory episodes, can be reduced and prevented with simple measures of hygiene, skin care, exercises, and elevation of affected limbs. People with lymphoedema must have access to continuing care throughout their lives, both to manage the disease and to prevent progression to more advanced stages.

The GPELF aims to provide access to a minimum package of care for every person with associated chronic manifestations of lymphatic filariasis in all areas where the disease is present, thus alleviating suffering and promoting improvement in their quality of life.

Success in 2020 will be achieved if patients have access to the following minimum package of care:
-Treatment for episodes of adenolymphangitis (ADL);
-Guidance in applying simple measures to manage lymphoedema to prevent progression of disease and debilitating, inflammatory episodes of ADL;

-Surgery for hydrocele;

-Treatment of infected people with antifilarial medicines.

Vector control:

Mosquito control is a supplemental strategy supported by WHO. It is used to reduce transmission of lymphatic filariasis and other mosquito-borne infections. Depending on the parasite-vector species, measures such as insecticide-treated nets, indoor residual spraying or personal protection measures may help protect people from infection. The use of insecticide-treated nets in areas where *Anopheles* is the primary vector for filariasis enhances the impact on transmission during and after MDA. Historically, vector control has in select settings contributed to the elimination of lymphatic filariasis in the absence of large-scale preventive chemotherapy.

Conclusion

8 October 2018, The World Health Organization (WHO) congratulated three more countries in its Western Pacific Region for having eliminated lymphatic filariasis as a public health problem. Palau, Viet Nam and Wallis and Futuna join 11 other countries1 validated by WHO for achieving this milestone, signalling continued global progress against this profoundly disfiguring and disabling neglected tropical disease.

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