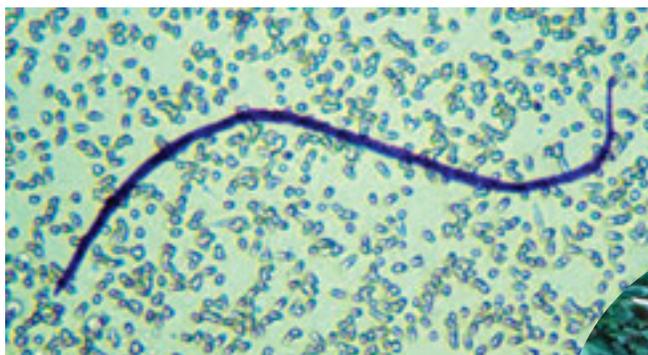


► diseases and disorders

► Elephantiasis

Extreme swelling in the arms and legs is the most visible effect of the parasitic disease known as lymphatic filariasis, or elephantiasis. According to the World Health Organization (WHO), more than 120 million people are affected by this disease worldwide, of which 40 million are disfigured and incapacitated. One-third of those infected live in India, one-third in Africa, and most of the remainder in South Asia, the Western Pacific, and parts of the Americas. From a global standpoint, the WHO claims that elephantiasis is the second-leading cause of permanent and long-term disability, because the deformity caused by the mutilation of the limbs and even the genitals causes not only physical crippling but also serious psychosocial damage.



The disease is caused by *Wuchereria bancrofti* and *Brugia malayi*, parasitic filarial worms that live almost exclusively in humans. These worms settle in the body's lymphatic system, infecting the immune system by disrupting the network of nodes and vessels that maintains the fluid balance between the body's blood and tissues. The parasites live in the body for approximately four to six years, laying millions of minute larvae that circulate in the blood.

Transmission occurs through mosquitoes, which bite infected individuals and pick up the worm larvae, also called microfilariae, that develop in the infective stage within 7–21 days. The microfilariae then make their way to the mosquito mouth and biting parts. As the mosquito continues biting people, the microfilariae are injected into their blood, reproducing and spreading throughout the bloodstream. Swelling results from the accumulation of parasites in the blood vessels, which restrict circulation and cause fluid to increase and build up in surrounding tissue. Disease symptoms sometimes do not occur until years after infection. Researchers are unsure of the reason, but the worst symptoms generally appear in adults, and more often in men. In communities where elephantiasis is prevalent, the WHO estimates that 10–50% of men suffer from genital damage, including hydrocoele, which is when the scrotum becomes filled with fluid.

Because of the role of mosquitoes, the incidence of elephantiasis is continuing to increase in tropical and subtropical areas where

the disease is already well established. According to the WHO, one of the main causes of this increase is the rapid and unplanned growth of cities, which creates ideal breeding sites for the mosquitoes. In areas where elephantiasis is endemic or widespread, chronic and acute symptoms tend to develop at an increased rate among newcomers in the local population who have not built up immunity to the disease.

The WHO has pursued two courses of action: controlling the transmission of elephantiasis in communities, especially where the disease is endemic, and controlling the effects of the disease by treating the individual. Both approaches have a significant public health component, because damaged tissues are susceptible to both primary and secondary infections. Therefore, hygiene measures in addition to antibiotics and antifungal agents are important in preventing infections and also in the repair and recovery of tissues already damaged by repeated filarial and bacterial infections.

The two most important drugs against elephantiasis are ivermectin and diethylcarbamazine (DEC), which kill both the microfilariae and the adult worms. The medications are simple to take, safe, and inexpensive. They also have proved effective against other diseases prevalent in the tropics and subtropics, such as intestinal worms, lice, and scabies. In addition, new diagnostic tools have been developed to make it easier and faster for doctors to identify the parasitic worms that cause elephantiasis in the bloodstream.



An elephantiasis victim's legs in Luzon, Philippines.

heavily infected villages, even in the first year of administration, according to the WHO.

In addition, both DEC and another drug, albendazole, have been shown to kill adult worms in infected cases. Ivermectin has a sterilizing effect on adult female worms, and combinations of all three drugs are important areas for future investigation regarding the adult worms.

—JULIE L. McDOWELL

For more information

National Institute of Allergy and Infectious Diseases, National Institutes of Health; www.niaid.nih.gov.
Lymphatic Filariasis Elimination, Control, Prevention, and Eradication; www.filariosis.org.
The World Health Organization; www.who.org. ■