Eradication of Guinea Worm in Ethiopia

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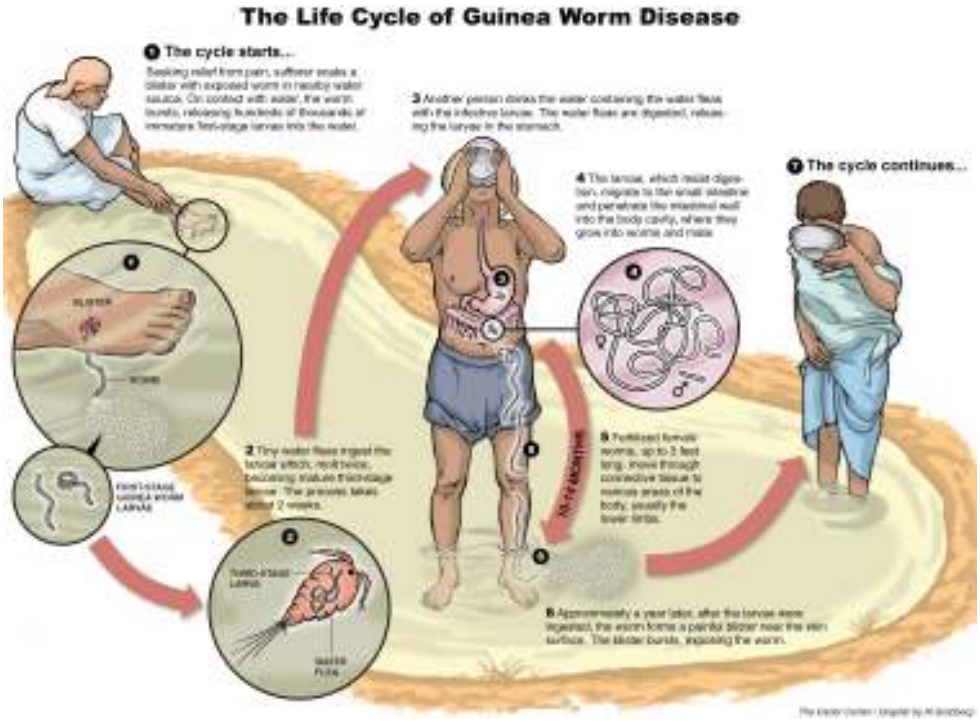
Introduction

Dracunculiasis, also known as Guinea worm disease (GWD), is an infection caused by the parasite Dracunculus medinensis. GWD is spread by drinking water containing the Guinea worm larvae, immature forms of the worm, and almost exclusively affects poor communities in remote parts of Ethiopia that do not have safe water to drink. GWD is considered by global health officials to be a neglected tropical disease as well as the first parasitic disease planned to be eradicated. The parasite migrates through the victim's subcutaneous tissues causing severe pain especially when it occurs in the joints. The worm eventually emerges from the feet most often, causing an intensely painful edema, a blister and an ulcer accompanied by fever, nausea and vomiting. Than the Infected persons try to relieve the burning sensation by immersing the infected part of their body in local water sources.This also induces a contraction of the female worm at the base of the ulcer causing the sudden expulsion of hundreds of thousands of first

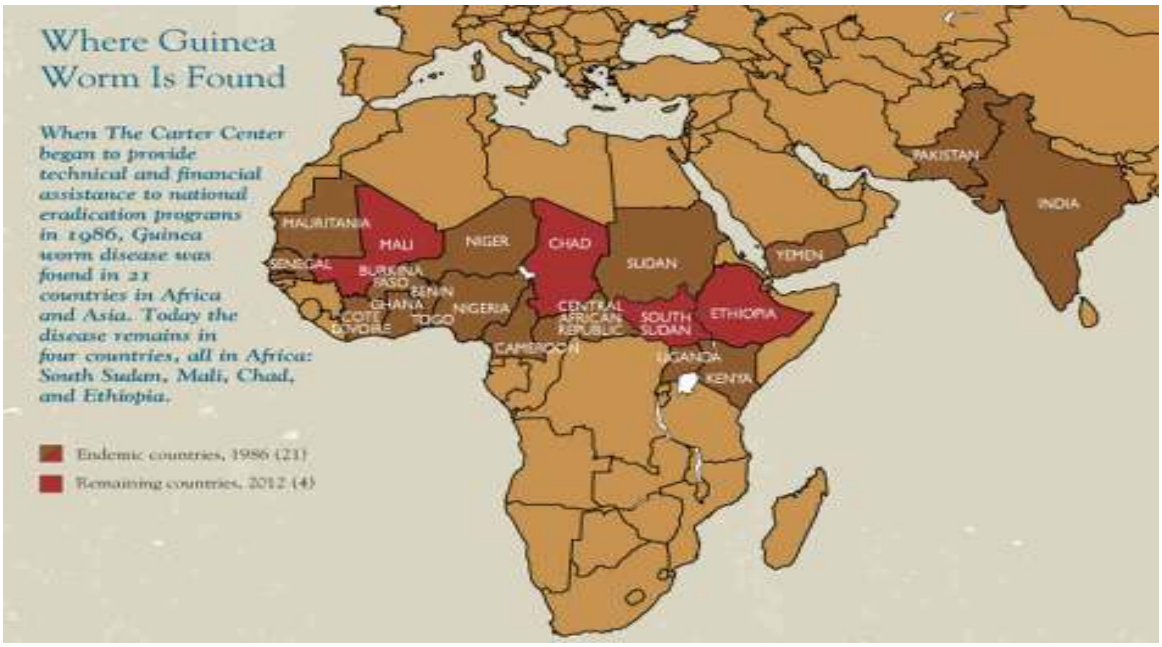
stage larvae into the water. They move actively in the water, where they can live for a few



days(WHO, 2012).

In 1986, the guinea worm disease (GWD) affected 21 countries and 3.5 million people annually (Carter Center, 2013). The disease starts with the worm's larvae entering the body via ingestion or drinking contaminated water. These larvae grow fast inside their host and create painful lesions in the skin. Once they exit the host, they continue the process of laying eggs in water body, and start the whole cycle over again. Due to guinea worm infection, many victims have suffered from disabilities that prevent them from working, going to school, and taking care of their family, and some even face death themselves. The top four nations still endemic with guinea worm disease include Mali, Chad, South Sudan, and Ethiopia. Today, the incidence of guinea worm disease has been reduced by more than 99 percent thanks to the efforts and hard work of the Carter Center and its partners (Carter Center, 2013). The disease inflicts disability and social and financial burdens on affected communities. Because there is no medication or

vaccine to eliminate guinea worm, control of the disease depends on not ingesting contaminated water, treating water sources with larvicides, and preventing people with emerging adult worms from entering water sources used for drinking so that adult female worms do not release more



larvae into the water.

Program A

The Ethiopian *Dracunculiasis* Eradication Program is operated by the WHO and the Carter Center whose main focus is to reduce the mortality and morbidity rate due to guinea worm disease (WHO, 2012). The WHO also provides technical support and equipment to the countries in need, in order to help them eradicate the disease. Operation EGW, along with the WHO, has a mission to eliminate GWD and help educate the Ethiopian public about guinea worm disease and the dangerous effects that GWD has on the victims. They also perform tests on water sources in the areas where guinea worm has been detected and carry out treatment to victims of guinea worm (WHO, 2012).

Program B

The Carter Center Program started in 1986, with one goal in mind: to eradicate the Guinea Worm disease (Carter Center, 2013). They worked together with various other organizations in order to work on their goals of eradicating this disease. Since there is no cure, meaning no medications or vaccines to prevent Guinea Worm, efforts have been going towards treating and removing the disease once it has entered the human body. The Carter Center's strategy has been to educate and hope to change the behavior of the people in the regions they are trying to reach (Carter Center, 2013). They teach people how to filter all drinking water and how to prevent transmitting the disease. Stronger efforts need to be taken in order to enforce a healthier lifestyle on this region. As well as people teaching the members of these communities about proper prevention methods (Carter Center, 2013).

The outlook for this particular program is to eradicate the Guinea Worm from Mali, Chad, South Sudan, and Ethiopia. The other partners involved are the National Ministries of Health, who oversee the domestic Guinea Worm elimination programs; they are responsible for training field workers and staff (CDCP, 2013). The World Health Organization plays an important role in starting the process of eliminating and assisting national programs. They are responsible for certifying Guinea Worm-free nations and different surveillance programs in Guinea Worm-free areas (CDCP, 2013). The Centers for Disease Control and Prevention provide the technical assistance and whether or not an individual is truly infected with Guinea Worms. UNICEF helps countries by providing safe sources of drinking water to areas that have been effected tremendously by an outbreak (CDCP, 2013).

Analysis

There were 542 verified cases of Guinea worm reported globally, of which 521 (96.1%) were reported in South Sudan. Protracted civil wars, an inadequate workforce, neglect of potable

water provision programs, suboptimal Guinea worm surveillance and case containment, and fragmented health systems account for many of the structural and operational factors encumbering South Sudan's Guinea worm eradication efforts.

In addition to partnering with the Ethiopia Ministry of Health, the Norwegian Church Aid, Ethiopian Federal Water Resources Development, the Carter Center's Guinea Worm Eradication Program in Ethiopia partners with Health and Development International, to provide a reward system in all endemic areas to improve reporting and detection of cases. These are monetary rewards given to people in the community with cases who report early. The rewards are incentives for infected community members to remain at a health facility, for the duration of their illness, and be provided three meals a day, a place to sleep, and free medical care until all worms have been removed. Through the use of case and vector controls, health education, provision of safe water, provision of filters, and training of village-based volunteers, the number of cases of Guinea Worm disease has been decreased by more than 97 percent between 1994 and 2003. Gambella reported 41 indigenous cases, and only seven cases of dracunculiasis has been reported in 2013. The efforts of the Carter Center and WHO has proven to be a great success in achievements in the eradication process.

Case Studies

The first case study was conducted during the early eradication efforts of GWD in the African countries of Nigeria and Ivory Coast. They focused most of their efforts on the construction and maintenance of clean water supplies. This proved to be very effective as an 81% reduction of GWD cases was reported in 20 Nigerian villages provided with boreholes and water pumps. Similar results were reported in Ivory Coast, after the construction of 12,500 boreholes, indicat-

ing a decrease of GWD from 67,123 cases in 1966 to only 1,889 cases in 1985 (Cairncross et al. 2002).

The second case study presented by UNICEF in Rajasthan India from 1985 to 1993 focused on the surgical extraction of the worm. This approach despite being invasive produced promising results: In the three districts in Rajasthan where extraction was practiced , the number of GWD cases decreased by 83% in the 8 year period compared to only 50% decrease in districts where surgical extraction was not practiced (Cairncross et al. 2002).

Conclusion

There is no vaccine to prevent nor is there any medication to treat the disease. However prevention is possible and it is through preventive strategies that the disease is on the verge of eradication. Some of these strategies are: Surveillance to determine actual caseload distribution and trends in response to control measures. Educating community members from whom worms are emerging to avoid immersing affected parts in sources of drinking water. Filtering potentially contaminated drinking water using cloth filters or filtered drinking straws. Providing safe drinking water from boreholes or hand dug wells. Containment of transmission through voluntary isolation of each patient to prevent contamination of drinking water sources, provision of first aid, and manual extraction of the worm. Surveillance, community education, potable water provision, and case containment remain weak facets of the program. Governments and international foundations have taken a stand to end the harmful effects of this guinea worm disease in the planet.

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