Public Health Practice

No transmission of dracunculiasis in Egypt for two centuries

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Despite occasional assertions to the contrary, no convincing evidence has been found of guinea-worm disease (dracunculiasis) being transmitted in humans in Egypt during the nineteenth and twentieth centuries. The confusion appears to be caused mainly by imported cases and the incidence of the disease in animals.

Egypt is the source of our earliest evidence of dracunculiasis. A calcified *Dracunculus* (also known as “guinea worm” and less frequently as “dragon worm” or “serpent worm”) has been found in an Egyptian mummy, and writings in the Ebers medical papyrus, dating from about 1550 BC, are thought to refer to dracunculiasis. Some writers have suggested that it is only recently that the disease disappeared from Egypt, but no definite evidence has been found to support this view.

Dracunculiasis has a very distinctive pathology (see box), and the long thread-like worm is easily recognized by local people in endemic areas. It is transmitted in stagnant and semi-stagnant water in such sources as small ponds, pools left by dried-up streams, and step wells. There are records in India, Saudi Arabia and West Africa of local people removing the 30–100 cm long threadlike worm from the body by slowly winding it round a stick.

Cases of dracunculiasis are recorded in medical works by late Classical and Arabic writers living in or near the endemic areas in the Middle East. The renowned Muslim physician Avicenna (Abu Ali Ibn Sina, 980–1037 AD) in Persia provided the first scientific description of the clinical symptoms of the disease, which he called *irk al medina*, “Medina thread”. In addition to implying that its provenance was Medina, in Arabia, he suggested that the worm may have been found in Egypt, though he did not specify where. Today, the only recent reports of cases of dracunculiasis originating in the Middle East have come from Yemen, where 89 cases were reported to WHO and verified in 1993 and 1994.

**External and imported cases**

An extensive study of English and French printed sources has failed to provide any evidence for the transmission of dracunculiasis within the present borders of Egypt since the time of the Napoleonic invasion in 1798. From 1899 to 1924 Sudan was administered from Egypt, and there are some records of the
disease occurring in Egypt during that period, but they actually refer to present-day Sudan, where dracunculiasis is still endemic.

Antoine Clot-Bey, who founded the first Western-style medical school in Egypt, wrote that guinea-worm had been almost unknown before the conquest of Sennar by Mohammed Ali Pasha in 1821 (1). However, he wrote:

When I came to Egypt in the winter of 1825, I found in the Abu Zaabal Hospital about one hundred affected individuals ... I observed it in a large number of Arab military men ... with Negroes and even in two Europeans.

He noted that most of these cases came from Hedjaz (now in Saudi-Arabia), Nubia (south of Aswan on the Nile), and Ethiopia. In 1847, a Dr F. Pruner, who travelled widely in the Middle East, Abyssinia and the Sudan, stated that the disease was no longer present in Egypt but was found in several provinces of the Sudan (2). There are many other records of dracunculiasis cases in the Sudan.

Most of the cases mentioned as occurring in Egypt are likely to have been acquired outside the country’s present borders. Because the

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### A preventable nightmare

**The disease**

Dracunculiasis is caused by the parasitic worm Dracunculus medinensis or “guinea worm”. The adult female, which carries from 1 to 3 million embryos, can measure up to a metre in length and 2 mm across. The parasite migrates through the victim’s body, causing severe pain, especially in the areas around the joints. The worm eventually emerges (from the feet in 90% of cases), causing an intensely painful oedema, a blister and then an ulcer. When the worm perforates the skin, pain is accompanied by fever, nausea and vomiting. In less serious cases, elimination of the worm will leave the patient disabled for two to four weeks. If there is more than one worm, or if more complex damage is caused by the worm’s migration and emergence, or if secondary infections occur, the patient can remain severely ill for several months.

**Transmission**

The female guinea worm releases her embryos in stagnant water. A crustacean called the cyclops, measuring from 0.5 to 2 mm in length, swallows a single larva, which makes its way to its host’s abdomen and becomes infectious after about two weeks. When a human being drinks water containing infected cyclops, the cyclops are destroyed by human gastric juices, and the infectious larvae are liberated. They puncture the intestine of the drinker, and enter the tissues. One year after the water containing the infected cyclops has been consumed, the fully grown female worms start to migrate through the infected person’s body.

**Epidemiology and control**

The disease occurs in India and Yemen, and in 16 African countries south of the Sahara. In 1994, 164 973 cases were reported to WHO, of which 99.7% originated in Africa. An estimated 120 million people are at risk of infection in Africa, and 10 million in Asia. WHO’s Dracunculiasis Eradication Programme started in 1982, in conjunction with the United Nations International Drinking-Water Supply and Sanitation Decade (1981–1990). In 1991, the World Health Assembly declared its commitment to eradicating the disease by 1995. An 82% reduction in cases was achieved between 1989 and 1994. Control activities are centred on filtering or treating suspect drinking-water in endemic areas, thus breaking the cycle of transmission.
disease takes a year to develop, the worm could emerge when the host was in Egypt, having entered his or her body further up the Nile, in Ethiopia, or elsewhere. This was the case with the well-known traveller James Bruce, who suffered severely from dracunculiasis while in Egypt in 1773, after travelling in Ethiopia in search of the source of the Nile (3).

Similarly, a century later, in 1875, the resident physician at Port Said reported a case of the infection in a young Greek sailor who had probably picked it up elsewhere. The physician, called Vauvray, stated that none of his colleagues had ever noted cases of dracunculiasis in Egypt.

**Occurrence in animals**

A source of some confusion about the status of dracunculiasis among humans in Egypt may be the many references that have been made to its incidence in animals. For instance, in 1893, Littlewood, a veterinary surgeon, wrote a paper entitled “Guinea-worm in Egypt”. He began by quoting Clot-Bey to the effect that the disease had become very common “since Nubians were enlisted into the Egyptian regiments”, but then confined himself to an account of its occurrence in animals (4).

Khalil, a leading Egyptian parasitologist, wrote in 1932:

> in recent years no human case of *Dracunculus medinensis* infection was observed in Egypt. Only one case was admitted to Kasr el Ainy Hospital in 1923 which on investigation proved to have been contracted in Yemen or the Anglo-Egyptian Sudan. The patient arrived a few months before in Egypt ... During the last four years, 2 dogs were observed infected with *Dracunculus* and in both cases it was certain to be of Egyptian origin (5).

There is no clear evidence for dracunculiasis transmission within Egypt in the nineteenth or twentieth centuries. Ghalioungui considers it to be just possible that at the time when Clot-Bey observed 100 cases in the Abu Zaabal Hospital in 1825, small ponds in the vicinity could have provided temporary transmission sites (6). However, taking all the evidence together, the cases reported in Egypt during the period are much more likely to have occurred among people who had travelled in known endemic areas, such as Ethiopia, Saudi Arabia and the Sudan. There are no recent reports of the disease in Ministry of Health records. Physicians who have practised for many years in Egypt, even in the far south, have not seen cases of the infection.

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**References**


