Public Health

Chagas disease: hidden affliction and visible neglect

Background and epidemiology: In September 2005, Médecins Sans Frontières (MSF) hosted the Canadian launch of a photography exhibition[1] and feature documentary (www.chagasthemovie.com) about Chagas disease. This parasitic disease, which is endemic to South America, affects 16 million people and claims up to 50 000 lives every year.

The venue, outfitted with an insulated back screening room, was a discreet, darkened bar aptly called In Camera, situated in a regentrified block of Queen Street in downtown Toronto. The event itself was somewhat intoxicating — photos and film displayed with an echo of the giddy, lingering aftermath of the recently concluded Toronto International Film Festival. But starkly juxtaposed against the mood was the sobriety of the topic and the scope of the need, a message not lost on the attentive audience — journalists and physicians who left the in-camera session charged with the duty to spread both light and word on this neglected disease.

Chagas is caused by *Trypanosoma cruzi*, a parasite that shares some of the evasive and survival tactics of other notorious pathogens that cause latent illness and delayed manifestations, such as *Mycobacterium tuberculosis* and *Treponema pallidum*. *T. cruzi* is transmitted to humans by triatomine bugs (Fig. 1), large bedbugs that deposit feces on the skin while they bite. When people rub the bite wound or subsequently their eyes or mouth, the feces, which contain the parasite, enter the bloodstream. Chagas disease can also be transmitted during pregnancy from mother to baby and via infected blood transfusions or organ transplants. The United States and Canada were alerted to the emerging presence of this disease in the northern hemisphere in 2002, after reports of 3 immunosuppressed organ recipients in the United States who contracted *T. cruzi* infection.[2]

WHO/TDR/Stammers

Fig. 1: An adult *Rhodnius prolixus* taking a blood meal through someone's skin. Vectors of Chagas disease that bite people range from the mid–United States (e.g., California) southward throughout the Americas and also include *Triatoma* species and *Panstrongylus megistus*.

Chagas disease progresses in stages. In the acute, immediate aftermath of infection when the parasite can be found in the blood, there are no telltale symptoms other than perhaps a fever, hepatosplenomegaly and swollen lymph glands. An inflammatory reaction, chagoma, may occur at the site of infection. About 8 weeks after initial infection, the transient parasitemia resolves and the asymptomatic indeterminate stage begins, which may last for many years.

Much later, in a proportion of infected people, the disease manifests with cardiac (cardiac dilatations, arrhythmias and conduction abnormalities) and intestinal (megaesophagus, megacolon) involvement. These later problems are thought to result from antigenic crossreactivity between the parasite and its human host, which generates an aberrant, destructive cell-mediated response.[3]

Clinical management: There is no simple or rapid diagnostic test for Chagas disease. In the acute phase, diagnosis is established by demonstration of the parasite in the blood, by direct examination or after hemoconcentration, culture or xenodiagnosis (in which uninfected triatomine bugs are allowed to feed on the patient, to see if the parasite can subsequently be recovered in the feces of the bug). As the disease progresses, it becomes more difficult to detect; 2 or 3 tests are often required to make a definitive diagnosis.

Either of 2 remedies, both unfortunately beset by logistical problems, can be used to treat Chagas disease during the acute phase. Nifurtimox, developed in 1960, is commercially available for US$48 per treatment regimen — the equivalent of a month of a Bolivian miner's salary. Benznidazole is available with delays of up to 4 months owing to constraints in the supply of the drug's active ingredient. Neither drug is effective once the disease has progressed to the chronic stage. These drugs are not dispensed in pediatric versions, which complicates the treatment of children.

Prevention: Chagas disease is a disease of poverty and international neglect. Efforts to eradicate the triatomines persist, but pesticide administration appears to be patchy and largely ineffective. Since treatment is toxic and resource-intensive and people can be reinfected, MSF now administers treatment to patients only when the local infestation rate is below 3%.

In the short term, MSF is urging that production of nifurtimox and benznidazole be secured and that pediatric versions of these drugs be developed. MSF is also urging research and development efforts both to improve diagnostic tests to identify all stages of the disease and to discover simple, less toxic and more efficient treatments for all forms of Chagas disease, in adults and children alike.

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DOI:10.1503/cmaj.051442

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