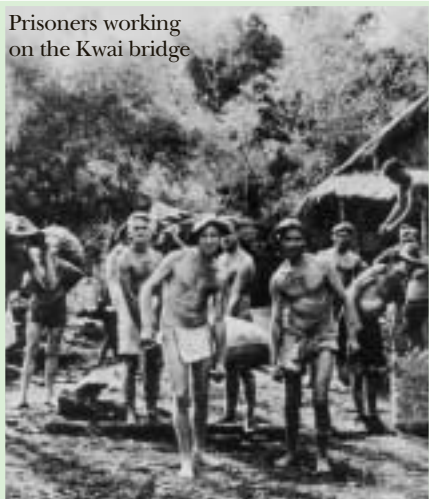


# Strongyloidiasis

A funny sounding name, for a funny sort of illness. **Ellen Welch** and **Geoff Gill** explain how the consequences of this tropical disease can be far from funny

Prisoners working on the Kwai bridge



TOP PHOTO

## An example from recent history

Shortly after the second world war it became obvious that many of the men who had been held captive in the Far East had contracted strongyloidiasis, especially those prisoners who were forced to work on the infamous Thai-Burma “death” railway. This 400 km railway line, engineered by the Japanese in an attempt to win the war, stretched through mountainous jungle in northern Thailand over to Burma (now Myanmar). A year of exhausting work with primitive tools, in areas rife with tropical diseases, led to the deaths of 20 000 Allied prisoners and 100 000 Asian labourers, and a railway that never fulfilled any useful purpose.

Among the host of tropical diseases contracted by the men,<sup>3</sup> the tropical jungle environment of the Burma railway provided perfect conditions for development of the filariform *Strongyloides* larvae, which infected the men through the soles of their poorly shod feet as they worked.

Tropical medicine is a subject that is often neglected from medical student timetables, so few junior doctors will be aware of the existence of the tiny parasite *Strongyloides stercoralis*, the causal agent of strongyloidiasis. This strange sounding disease is uncommon in the United Kingdom, but it’s a big problem around the world. Consequences can be fatal, and in countries where it is rare, it is important to recognise it in patients returning from the tropics. Globally, the prevalence of strongyloidiasis is estimated at 100 million cases.

## What is strongyloidiasis?

*Strongyloides stercoralis* is a soil dwelling nematode worm (2 mm by 0.4 mm in size), common in the wet tropics of South America, Africa, and South East Asia. The complex parasite has a dual life cycle involving both parasitic and free living stages. Adult worms can survive and reproduce both in the small intestine of man and in the soil, giving rise to a variety of possible routes for infection. During direct development, adult eggs hatch in the intestine into rhabditiform larvae, which are passed in the stool. Under favourable conditions they mature in the soil into filariform (infective) larvae that are capable of penetrating the skin of humans. The rhabditiform larvae also have the ability to develop into free living adult worms that exist in the soil independently of humans—this is known as indirect development. Once the infective larvae have penetrated the skin, they travel to the lungs via the circulatory system, where they migrate up the airways, reach the oesophagus, and are swallowed back down to the intestine where mating occurs, completing the cycle.

## Who gets it?

Anyone in tropical countries can get it. The usual mode of infection is via larval penetration through the soles of the feet, when walking barefoot on contaminated soil. Infection is associated with poverty and unsanitary conditions and is usually found in rural areas, institutional settings, and lower socioeconomic groups. Since the larvae thrive in warm, wet soil, exposure to the parasite in the United Kingdom is extremely rare.<sup>1</sup> Dogs, cats, and other mammals can also harbour the parasite.<sup>2</sup>

## Clinical features

Clinical features of strongyloidiasis are variable and differ if the infection is acute

or chronic. In the acute stage of infection, diarrhoea (sometimes with dysentery or steatorrhoea), and abdominal pain predominate, while the pathognomic larva currens rash is the main feature in the chronic illness. This typical serpiginous rash (follows a snake-like track) can appear and disappear, usually around the trunk, in a few hours or days, which distinguishes it from the similar, longer lasting cutaneous larva migrans rash of hookworms. Rarer features of the infection relate to the passage of larvae through the lungs, which can give rise to pulmonary infiltrates, pneumonitis, and asthma. Chronic infection with *Strongyloides stercoralis* has been well documented in ex Far East prisoners of war,<sup>4-7</sup> persisting asymptotically for over 30 years in some cases.

## Why does it last so long?

In cases of chronic strongyloidiasis, the life-cycle of the parasite is completed entirely within the host. In the lower gastrointestinal tract, filariform larvae can penetrate the bowel mucosa or perianal skin and then pass via the tissues to the lungs. This “autoinfection” process means that *Strongyloides* can persist in humans for decades, even after departure from endemic areas.<sup>5</sup>

## Hyperinfection

Strongyloidiasis can persist for decades, with either vague symptoms or none at all—but is still an extremely important disease to detect, since potentially fatal hyperinfection may occur. During periods of immunosuppression, the worms multiply and autoinfection is increased. The larvae migrate through the bowel wall, taking with them Gram negative organisms that can lead to peritonitis and multiorgan involvement.<sup>6,9</sup> The hyperinfection syndrome is difficult to treat and is nearly always fatal, making it important to screen at risk patients embarking on immunosuppressive treatment.

## Diagnosis and treatment

Strongyloidiasis should be considered as a possible cause of diarrhoea (with or without blood) in tropical countries. Rhabditiform larvae of *Strongyloides* in the stool is diagnostic for the infection, but stool examination is notorious for its lack of sensitivity.<sup>5</sup> Hypereosinophilia is suggestive of the infection, but lack of it does not exclude the diagnosis. In the past, some

patients were subjected to the duodenal string test, but this was an unpleasant procedure that yielded poor results.<sup>10</sup> Underdiagnosis of strongyloidiasis was a major problem before the development of an enzyme linked immunosorbent assay for *Strongyloides* (ELISA).

The antihelminth drug thiabendazole was the only treatment available for many years,<sup>11</sup> although it was occasionally ineffective and caused unpleasant side effects in most patients.<sup>12</sup> A dose of 400 mg of



albendazole, however, taken twice daily for three days, has shown a six month cure rate of 81%, with negligible side effects, and has been the favoured drug since 1993.<sup>13</sup>

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