Continuing the theme of parasite infection, this article takes a look at some specific species infections.

**Strongyloides**

*Strongyloides stercoralis* is an opportunist pathogen in several species of mammal, including humans and dogs. It is a soil nematode, just visible to the naked eye, which is acquired through soil contaminated with faeces and close household contact with infected people. Immunocompromised persons are also at risk of being infected. Malnutrition and HIV infection are known to play a role. These factors mean that the infestation is widespread in Africa and can be serious in extreme conditions. Warm, moist conditions favour *Strongyloides* infection, along with crowding and poor sanitation. The role of dogs in transmission is not clear. Improving sanitation is probably the most effective community preventive measure. The parasite is probably acquired in childhood and carried for life, but symptoms may only appear during intercurrent illness.

- **Clinical features.** The classic skin eruption is larva currens – consisting of itchy weals on the buttocks that become elongated, moving several centimetres an hour. Crops of urticarial lesions may occur in chronic infection, lasting for days at a time. As in other species of migrating larvae, cough and wheeze are a clinical feature, accompanied by eosinophilia and hilar enlargement. Pulmonary shadows may be seen on radiographs. Frank malabsorption and protein-losing enteropathy have been described, although gut manifestations are generally nonspecific. Disseminated strongyloidiasis is associated with predisposing conditions such as treatment with steroids, malignancy, immunosuppression or cachexia and should be included in the differential diagnosis of a severely ill patient with diarrhoea. Fever, shock, jaundice, disseminated intravascular coagulation and coma may occur.

- **Diagnosis.** This is not straightforward. Examination of the stool is not sensitive and specialised microscopic and culture techniques are needed.

- **Treatment.** Ivermectin is the drug of choice and a single dose of 200 µg/kg is effective. Disseminated strongyloidiasis may need treatment for 7 days.

**Ascaris lumbricoides**

This is a very prevalent infection, affecting up to 90% or more of people in tropical and temperate climates wherever human faeces contaminate soil. Although all ages carry the infection, young children have a higher worm load and so greater morbidity. Another nematode, this worm is larger than *Strongyloides* at 25 - 35 cm long. The adults can live for several years and the females produce as many as 200 000 eggs per day. The eggs do not infect directly; they need to form embryos while lying in the soil. This means that soil that appears clear of faeces may still be infective many months after the initial contamination. Embryonated eggs, when swallowed, release larvae into the stomach. These invade the intestinal mucosa, pass to the liver through the portal vein and then to the heart and lungs. From the alveoli, they pass into the bronchial mucous and are swallowed again, maturing once they reach the small intestine. The complete cycle, from eggs to adulthood, takes 2 months. This parasite is important in the developing world, particularly among children. Prevention goes hand in hand with community development.

- **Clinical features.** Abdominal pain and discomfort are common in infected and uninfected children, and authorities believe it is almost impossible to assess the effect of worms. However, a large burden of worms can cause mechanical obstruction, needing emergency surgery, particularly in the small intestine of children. They may also be involved in intussusception or volvulus. Obstructive jaundice results if worms migrate into the bile duct, as well as recurrent cholangitis or acute pancreatitis and peritonitis. Ectopic migration of worms to the larynx, trachea, bronchi, eyes, and ENT system can cause obstructive effects and even fatalities. Migration is promoted by fever, which explains why febrile children commonly vomit worms, or have worms in the nose. As the larvae migrate through the lungs they can cause allergic effects and eosinophilia, although these are more common in those who do not live in endemic areas. Ascaris infection is likely to have a negative contribution to nutrition and growth, although this has not been easy to demonstrate scientifically. The best established effect is of exacerbation of vitamin A deficiency, which in itself can lead to further malnutrition through effects on the intestinal mucosa.

- **Diagnosis.** This is by demonstrating eggs in the stool, which are easily recognised under the microscope.

- **Treatment.** Mebendazole and albendazole are the drugs of choice, equally effective. The dose of mebendazole is 100 mg twice daily for 3 days, or 500 mg as a single dose. Albendazole can be given as 200 mg twice daily for 3 days or 400 mg once.


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