Ascaris Lumbricoides—The Ubiquitous Roundworm

Maj S S Wijesinha*

MSc, FRCSE, FRCSI, RAMC (TA)

219 (Wessex) General Hospital, RAMC (V)

Capt C Y Wijesinha

MB BS, DTM&H, SLAMC (V)

Colombo Military Hospital, SLAMC (V)

Introduction

The undergraduate curriculum in most British medical schools today rarely teaches more than a vague idea of tropical diseases. In today's Army, a high proportion of personnel serves overseas, and tropical diseases can easily be imported by parasites taking 'free rides' in the bodies of their hosts into the UK¹. Frequently, patients who acquire such diseases are at great risk of their illness being unrecognised or incorrectly treated.

Recent WHO reports estimate that the roundworm *Ascaris lumbricoides* infects about a quarter of the world's population, making it the most common intestinal helminth in man. The route of infection is peroral, i.e. eggs swallowed by an individual hatch in the intestine and liberate a larva. The larva migrates through the intestinal wall and reaches the lungs via the circulation. Further growth and development occurs in the lung and finally the larva penetrates the alveolar wall, reaches the pharynx, is swallowed and develops into an adult worm that lives for a year or more, lying free in the lumen of the small gut. The eggs produced by the fertilised females pass out with the faeces. These eggs can survive for long periods in moist soil—in 1953, Mueller² in Berlin experimentally contaminated a garden with roundworm eggs and found them viable after six years!

Ascaris infection is prevalent in regions where sanitation is poor, fresh night soil is used as a fertiliser, and flies abound. This is the situation in most tropical and sub-tropical countries. Roundworm disease has been reported from countries as far apart as the United States and Poland, South Africa and Sri Lanka, Korea and Nigeria. Absence from

the British literature is probably due, not to lack of incidence but to lack of detection.

Clinical features and treatment

Ascaris infection can present to the medical officer in three ways:

1. Pulmonary Ascariasis
2. Intestinal Ascariasis
3. Complications caused by wandering worms.

Pulmonary Ascariasis

Once the eggs are ingested, larvae develop within the intestinal lumen. These burrow through the gut mucosa into the bloodstream and are carried into the lungs. Here they can cause a variety of clinical signs, ranging from a mild cough with eosinophilia, to a severe lung infection accompanied by haemoptysis, fever and bronchospasm. This type of pneumonia occurs 7 to 14 days after infection, and is known as Loeffler's syndrome.

Only symptomatic treatment should be given, since dying larvae cause greater harm in the lungs than living ones. In severe cases, steroids are effective.

Intestinal Ascariasis

Most patients harbouring intestinal roundworms have no symptoms apart from vague abdominal discomfort, intermittent loose stools and episodes of nausea. In children, particularly with heavy worm loads, apathy, anaemia, urticarial rashes and even malnutrition may be seen. We have seen children as young as six months harbouring roundworms.

On examination, gentle abdominal palpation usually reveals mobile masses that change in size, shape and position, i.e. loops of gut containing worms. These may show on plain X-ray (Figure 1). Recently, Ellman *et al*³ (1980) described the radiological features by which intestinal Ascariasis may be diagnosed on

*Now: Consultant Surgeon, Military Hospital, Colombo.

Fig. 1 Plain radiograph of abdomen showing whorls of roundworms

Fig. 2 Contrast study (Barium enema) of intestine showing roundworms in the ascending colon

plain radiography. Barium studies, if performed, outline the worms within the intestine (Figure 2).

In our experience, a raised eosinophil count in peripheral blood is often not seen. Serological tests, though available, are inadequate for practical use; diagnosis is confirmed by finding live ova in the stools. The finding of roundworms in the intestine, even though the patient is asymptomatic, makes treatment mandatory to prevent possible complications. Today several effective drugs are available e.g.

1. Piperazine citrate elixir (containing 750 mg per 5 ml) given as a single dose:—

Adults and children over 12 years	15 ml
Children 5 to 12 years	10 ml
Children 2 to 5 years	5 ml
Children up to 2 years	75 mg per kg
2. Mebendazole (Tablets or suspension)
Three day course of 100 mg bd
3. Levamisole (Tablets or suspension)
Single dose of 2.5 mg per kg

Complications of Ascariasis

Dangerous complications can arise from the wanderlust of these worms and their propensity to explore orifices, ducts and cavities. They may be vomited up or passed per rectum; worms have been known to crawl out of the nose or even through a nasogastric tube! They can enter the bile ducts, pancreatic duct or appendix—thus simulating gall bladder disease, pancreatitis or appendicitis (Figure 3). Worms in the biliary tree can invade the liver parenchyma to cause abscesses—or, dying in the biliary tree, can induce a granulomatous inflammatory reaction producing chronic stricture⁴. Especially in children, where the size of the gut lumen relative to the bolus of worms is small, intestinal obstruction and intussusception can occur. Rarely, the finding of worms lying free in the peritoneal cavity in association with gut perforation has been reported⁵.

The medical officer serving in this country is unlikely to see many cases of roundworm disease—in contrast to practice overseas. However, a know-

Fig. 3 Specimen of appendix containing roundworms

ledge of the condition and its complications, together with an awareness that it can indeed be present in the UK today will help prevent an easily curable patient going away undiagnosed and inadequately treated.

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