Fasciola Hepatica

Synonyms: liver fluke, liver rot

Description

Fascioliasis is caused by two species of parasitic flatworms or trematodes that mainly affect the liver. The two species of trematodes that cause fascioliasis (Fasciola hepatica and Fasciola gigantica) are leaf-shaped worms, large enough to be visible to the naked eye (adult F. hepatica measure 20-30 mm x 13 mm; adult F. gigantica measure 25-75 mm x 12 mm). They cause similar diseases in humans.\(^1\)

\(F.\ hepatica\) is a trematode (fluke) parasite that infests humans and many species of animals. \(F.\ hepatica\) is the usual cause of fascioliasis. It is one of the largest flukes, measuring up to 3.5 cm by 1.5 cm. The parasite lives in the liver and bile duct. Its hosts include herbivorous mammals and it is found in 46 species of domestic and wild animals as well as in man. The intermediate host is the \(Lymnaea\) genus of snail which lives in marshy areas and standing water. \(F.\ gigantica\) may also cause similar human disease, and several other species cause disease in animals. \(Fasciola\ halli\) and \(Fasciola\ californica\) infest sheep and cattle in the USA and may be synonymous with \(Fasciola jacksoni\) which infests elephants in Africa and India, \(Fasciola nyanzae\) whose host is the hippopotamus, and \(Fasciola magna\) which infests mostly deer, but also cattle and sheep.

Epidemiology

- \(F.\ hepatica\) is found in all continents except Antarctica. \(F.\ hepatica\) infects various animal species, but mostly herbivores.\(^2\) It affects ruminants much more than man.
- Fascioliasis is one of the most economically important parasitic diseases of livestock, causing disease in sheep and other domestic animals in Latin America, Africa, Europe, and China.
- Of the 750 million people who live in endemic areas, over 40 million are thought to be infected in total by food-borne trematodes.\(^3\)
- Specific figures for \(F.\ hepatica\) are estimated at 2.4 million in 61 countries and the number at risk is more than 180 million throughout the world.\(^4\) It is most common in Bolivia, Ecuador, Egypt and Peru, but is also found in European countries, including France, the UK, Spain and Portugal. The incidence has apparently increased over the a period of 20 years.

Life cycle\(^2\)

- Immature eggs are discharged in the biliary ducts and in the stool. The eggs release miracidia, which invade a suitable snail intermediate host.
- In the snail the parasites develop into cercariae, which are released from the snail and encyst as metacercariae on aquatic vegetation or other surfaces.
- Mammals become infected by eating contaminated vegetation. Humans become infected by ingesting contaminated freshwater plants, especially watercress.
- After ingestion, the metacercariae encyst in the duodenum and migrate through the intestinal wall, the peritoneal cavity, and the liver parenchyma into the biliary ducts, where they develop into adults. The adult flukes live in the large biliary ducts of the mammalian host.
- Human infection by consumption of raw liver from infected sheep, goats, and cows has also been reported.
Presentation[^2]

Although seen typically as a disease of developing countries, it does present in Europe and the developed world.

**Acute fascioliasis**
- In its severe form it occurs in sheep but rarely in man and requires large numbers of parasites, usually over 10,000, to be ingested. Large numbers of migrating larvae invade the liver and cause a traumatic hepatitis that is frequently fatal. Sometimes the liver capsule may rupture into the peritoneal cavity, causing death from peritonitis.
- More usually the invasive phase lasts many weeks, with the most common symptoms being intermittent fever, hepatomegaly, and abdominal pain, although up to 50% of infections may be subclinical.[^6]
- Abdominal pain is usually in the epigastrium or right hypochondrium.
- Other symptoms include malaise and wasting. Urticaria and eosinophilia are usual.

**Chronic fascioliasis**
- After reaching the liver, there is then a latent phase lasting months or even years, when infection is asymptomatic.
- However, with maturation there may be an obstructive phase causing hepatitis, cholangitis, or pancreatitis. Fasciola spp. are not adapted to using man as a definitive host and so the flukes may cause ectopic infections, especially in the lungs and subcutaneous tissues where they may form cysts.
- Halzoun is one such type of infection following consumption of raw liver. There is severe pharyngitis, dysphagia, sensation of a foreign body in the throat, and possibly airways obstruction.

**Differential diagnosis**
The potential list is vast, but amongst it are:
- Various forms of hepatitis.
- Amoebiasis.
- Leishmaniasis.
- Schistosomiasis.

**Investigations**
- FBC will usually show eosinophilia and probably anaemia. ESR may be raised.
- LFTs may show evidence of hepatocellular damage or evidence of obstruction.
- Stool microscopy may show the pathogen or the eggs.[^2]
- Various immunocassays are available and enzyme-linked immunosorbant assay (ELISA) tests are sensitive and specific.[^2]
- X-ray of the liver may show tract-like small abscesses and subcapsular lesions.
- Even with pulmonary symptoms, CXR is rarely rewarding.
- Ultrasound of the gallbladder and biliary tract may show adult worms as focal areas of increased echogenicity.[^7]
- Cholangiography may reveal multiple cystic dilatations of the ducts. Large cystic dilatation, small cystic ectasia, and mulberry-like dilatation are considered diagnostic of fascioliasis.

**Management**

**Non-drug**
Bed rest and a protein-rich diet are recommended. Iron and vitamins may be required.

**Drugs[^2]**
If dealing with such a case, seek expert advice. Triclabendazole is the drug of choice. Praziquantel is not effective and therefore not recommended.

**Surgical**
- Parasite removal at endoscopic retrograde cholangiopancreatography is effective in the biliary stage.
- Ascending cholangitis may require surgery.

**Complications**
- It is often associated with anaemia, especially in children.
- Pancreatitis.[^8]
- Biliary fibrosis.
- Rarely, cholangiocarcinoma can occur.

**Prognosis**
The disease rarely kills in humans. The prognosis is excellent with adequate treatment.
Prevention

- Water-grown vegetables should be washed with 6% vinegar or potassium permanganate for 5-10 minutes, which kills the encysted metacercariae. This approach is more successful than attempts to halt the consumption of raw vegetables.
- Cook water-grown vegetables thoroughly before eating.
- Avoid sewage contamination of growing areas.
- Use of molluscicides is the most frequent public health intervention, as it prevents the transmission of many other trematodes, including Schistosoma spp.
- Treatment of animals to reduce the reservoir and reduce stock losses has been used. Until the introduction of single-dose triclabendazole, bithionol was the only available treatment, much limited by expense and treatment duration.
- For the future, vaccination would seem to be a feasible option.\footnote{9}

Further reading & references

- Fasciola: Endoparasites and Ectoparasites; Southampton University
- Fascioliasis; World Health Organization
- Fascioliasis; DPDx, Centers for Disease Control and Prevention
- Hillyer GV; Fasciola antigens as vaccines against fascioliasis and schistosomiasis.; J Helminthol. 2005 Sep;79(3):241-7.

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