

## **Family DICROCOELIIDAE**

These trematodes are small, lancet-like flukes occurring in the biliary and pancreatic ducts of vertebrates. Miracidia are present in the eggs when they are passed in the faeces; there is no redial stage during development in the snail.

Common name : Lancet fluke

Species : *Dicrocoelium dendriticum*

### **Hosts:**

Sheep, cattle, deer and rabbits.

**Intermediate hosts:** Two are required:

- (1) **Land snails** of many genera.
- (2) **Brown ants** of the genus *Formica*.

### **Site:**

Bile ducts and gall bladder.

### **Distribution:**

Worldwide. The prevalence in all the world & high prevalence in European countries .

### **Species:**

- *Dicrocoelium dendriticum*.
  
- *D. hospes*

### **Life cycle :**

The egg does not hatch until ingested by the first intermediate host, the land snail, in which two generations of sporocysts develop which then produce cercariae. The latter are extruded in masses cemented together by slime. This phase of development takes at least three months.

The slime balls of cercariae are ingested by ants in which they develop to metacercariae mainly in the body cavity and occasionally the brain. The presence of a brain lesion in the ant, induced by metacercariae, impels the ant to climb up and remain on the tips of the herbage, thus increasing the chance of ingestion by the final host. This phase in the ant is completed in just over one month in summer temperatures.

In the final host, the metacercariae hatch in the small intestine and the young flukes migrate up the main bile duct and thence to the smaller ducts in the liver. There is no parenchymal migration and the prepatent period is 10-12 weeks. The flukes are longlived and can survive in the final host for several years.

### **PATHOGENESIS**

Although several thousand *D. dendriticum* are commonly found in the bile ducts, the livers are relatively normal; this is presumably due to the absence of a migratory phase. However, in heavier infections there is fibrosis of the smaller bile ducts and extensive cirrhosis can occur, sometimes the bile ducts become markedly distended.

Clinical signs : In many instances these are absent. Anaemia, oedema and emaciation have been reported in severe cases.

### **EPIDEMIOLOGY**

There are two important features which differentiate the epidemiology of *Dicrocoelium* from that of *Fasciola* :

- **The intermediate hosts are independent of water** and are evenly distributed on the terrain.
- **The egg can survive for months on dry pasture**, presenting a reservoir additional to that in the intermediate and final hosts.

## **DIAGNOSIS**

### **ANTEMORTEM**

- Eggs may be found on fecal sedimentation.
- Eggs are brown, operculated, oval, 36–46 .10–20  $\mu\text{m}$ , containing miracidia; operculum may be difficult to see.

### **POSTMORTEM**

- The flukes are flattened, leaf-like, 6–10 . 1.5–2.5mm; found in bile ducts; because of their small size, they may be missed at necropsy.
- Biopsy of liver can be done for detection the fluke in the parenchymatous tissue.
- different methods ( ELISA & Immunodiagnosis ) .

### **Treatment**

- enerally do not treat domestic animals for infection; if heavy infections are present, can use albendazole at 15–20 mg per kg once or 7.5 mg per kg ,once and repeated 2–3 weeks later.
- Fenbendazole at 100–150 mg per kg has also been used.

### **CONTROL**

-This is difficult because of :-

**1-** The longevity of *D. dendriticun* eggs .

**2-**The wide distribution of the intermediate hosts and the number of reservoir hosts. Control depended on :

- Treatment of the affected animals
- Land snail should be controlled by use of molluscicidal agent
- Control of the ants by use of insecticidal agent
- Biological control can be done by rearing ducks which ingest the land snails.

## **Family PARAMPHISTOMATIDAE**

**SYNONYMS:** Gastrodiscoidiasis or gastrodiscoidosis

Adult paramphistomes are mainly parasitic in the fore stomachs of ruminants, although a few species occur in the intestine of ruminants, pigs and horses. Their shape is not typical of the trematodes, being conical rather than flat. All require a water snail as an intermediate host. There are several genera of which *Paramphistoraum* is *Paramphistomum*.

**Hosts:** Ruminants.

**Intermediate hosts:-** Water snails; principally *Planorbis* and *Bulinus*.

**Site:-** Adults in the rumen and reticulum and immature stages in the duodenum.

**Species:-** *Paramphistorruum cervi*  
- *P. microbotlcriunc*

**Distribution:** Worldwide. They are of little veterinary significance in Europe and America .

### **LIFE CYCLE**

Development in the snail intermediate host is similar to that of *Fasciola* and under favourable conditions (26-30°C) can be completed in four weeks. After ingestion of encysted metacercariae with herbage, development in the final host occurs entirely in the alimentary tract. Following excystment in the duodenum the young flukes attach and feed there for about six weeks before migrating forward to the forestomachs where they mature. The prepatent period is between 7 and 10 weeks.

## **PATHOGENESIS**

Any pathogenic effect is associated with the intestinal phase of the infection. The young flukes are plug feeders and this results in severe erosions of the duodenal mucosa. In heavy infections these cause an enteritis characterized by oedema, haemorrhage and ulceration. At necropsy the young flukes can be seen as clusters of brownish pink parasites attached to the duodenal mucosa and occasionally also in the jejunum and abomasum. The adult parasites in the forestomachs are well tolerated, even when many thousands are present and feeding on the wall of the rumen or reticulum .

## **CLINICAL SIGNS**

In heavy duodenal infections, the most obvious sign is diarrhoea accompanied by anorexia and intense thirst. Sometimes in cattle, there is rectal haemorrhage following a period of prolonged straining. Mortality in acute outbreaks can be as high as 90%.

## **EPIDEMIOLOGY**

Paramphistomosis often depends for its continuous endemicity on permanent water masses, such as lakes and ponds, from which snails are dispersed into previously dry areas by flooding during heavy rains. Paramphistome eggs deposited by animals grazing these areas hatch and infect snails. Subsequent production of cercariae often coincides with receding water levels making them accessible to grazing ruminants. In other areas, the situation is complicated by the ability of the snails to aestivate on dry pastures and become reactivated on the return of rainfall.

A good immunity develops in cattle, and outbreaks are usually confined to young stock. However, adults continue to harbour low burdens of adult parasites and are important reservoirs of infection for snails. In contrast, sheep and goats are relatively susceptible throughout their lives.

## **DIAGNOSIS**

This is based on the clinical signs usually involving young animals in the herd and a history of grazing around snail habitats during a period of dry weather. Faecal examination is of little value since the disease occurs during the prepatent period. Confirmation can be obtained by a postmortem examination and recovery of the small flukes from the duodenum.

## **TREATMENT**

Resorantel and oxiclozanide are considered the anthelmintics of choice against both immature and adult rumen flukes in cattle and sheep.

## **CONTROL**

As in *F. gigantica* the best control is achieved by providing a piped water supply to troughs and preventing access of the animals to natural water. Even then snails may gain access to watering troughs and regular application of a molluscicide at source or manual removal of snails may be necessary.