Hepatic fascioliasis

Etiology :

1 – *Fasciola hepatica* is a most common and important liver fluke and has worldwide distribution

2- *Fasciola gigantica* is restricted to warmer regions including parts of Africa and Asia .

3 – Lymnaeid mud snails are intermediate host .

4 – Metacercaria onto herbage is the infective stage .

Epidemiology :

- ♦ The risks of hepatic fascioliasis is determined by the numbers of infected lymnaeid snails in the grazing area .
- ♦ The disease has predictable seasonal pattern in the regions were snails are active for only part of a year .
- ♦ Some lymnaeid snails have more aquatic habit than others but all restricted to damp or wet environment . In general they prefer non acidic , low laying swaby area with slowly moving water but land with small streams , spring , blocked drainage on spoilage from water troughs may also be potentially hazardous infecting ground .
- ♦ Land frequently irrigated is also highly suitable for infection to take place .
- ♦ Importance host snails of Fasciola hepatica include *Lymnaea truncata and Galba bulimoides* and others .

Pathogenesis :

Acute hepatic fascioliasis is caused by the passage of young *Fasciola hepatica* through the liver parenchyma . Clinical signs occur 5 – 6 weeks after the ingestion of large numbers of metacercaria . By this time the migration flukes are large enough to do mechanical damage to the liver . Acute hepatic insufficiency and haemorrhage results .

Quiescent spores of *C. novei* may become activated by the anaerobic necrotic condition created in liver parenchyma by migrating *F. hepatica* causing infectious necrotic hepatitis (Black disease) in sheep and cattle and sometime bacillary haemoglobinuria in cattle .

Chronic hepatic fascioliasis develop only after the adult flukes establish in the bile ducts and they cause cholangitis , biliary obstruction , fibrosis and leakage of plasma protein across the epithelium lead to edema especially in inter mandibular space .

Clinical findings :

♦ **Acute fascioliasis** in sheep most often occurs as sudden death without any clinical signs . It usually seen in the summer and autumn but may occurs at any time when sheep have opportunity to graze heavily contaminated herbages . If the disease is observed clinically in sheep it is manifested by

- Dullness .
- Lake of appetite .
- Pallor and edema of mucosa and conjunctiva .
- Pain when pressure is exerted over the area of liver .

● Deaths occur quickly and may be accompanied by passage of blood stained discharge from nostrils and anus .

Outbreaks are usually of short duration , most death occurs within a period of 2 – 3 weeks . Acute fascioliasis rarely occurs in cattle .

♦ **Subacute fascioliasis** : This form occurs mainly in sheep . the major clinical signs are weight loss , pallor of mucosa . Submandibular edema will be seen in only a few cases but many animals will resent palpation over the region of liver .

♦ **Chronic fascioliasis .**

♦ Chronic fascioliasis does not become apparent until several weeks after the danger of acute disease has receded .

♦ Affected sheep loss weight , develop submandibular edema (bottle jaw) and pallor of the mucosa over a period of a week .

♦ Shedding of wool may occur .

♦ The course of disease is often as long as 2 – 3 months in those which die . Many survive but may remain in poor condition for longer period .

♦ Cattle also loss weight especially lactating , fall of milk production , anaemia and chronic diarrhea may develop .

Clinical pathology :

■ **In acute fascioliasis there is**

♦ Severe normochromic anaemia , esonophilia and severe hypoalbuminemia .

♦ Increase in serum concentration of liver enzyme especially glutamate dehydrogenase and AST .

♦ Eggs will not be present in the feces as the flukes are still juvenile .

■ **In subacute and chronic disease .**

♦ Hypochromic microcytic anaemia , hypoalbuminemia and hyperglobulinemia .

♦ Submandibular edema and ascitis occur only occasionally in the subacute condition but more frequently in chronic disease .

♦ Serum gamma glutamyle transpeptidase concentration are raised , other liver function test are not significantly affected .

♦ The diagnosis of chronic fascioliasis can be confirmed by detection of large number of characteristic fluke eggs in the feces .

Necropsy findings .

♦ Acute fascioliasis .

● Badly damaged swollen liver .

● The peritoneal cavity may contain an excess of blood stained serum .

● The liver capsule may has many small perforations and subcapsular haemorrhage .

● The parenchyma show tracts of damaged tissue and is more friable than normal .

● The immature flukes are often so small that they are not readily discernible . They are most easily demonstrated by slicing a peace of liver thinly and shaking in water , permitting the flukes to settle at bottom .

● The size of the flukes may allow estimation of the duration of infection .

♦ **Chronic fascioliasis** .

● Leaf like flukes are present in grossly enlarged an thickened bile ducts .

● The bile ducts may protrude above the surface of liver and cysts may be present due to blockage of the duct with flukes and desquamated epithelial cells .

● Calcification of the bile ducts wall is common finding in the cattle but not in sheep .

● The hepatic parenchyma is extensively fibrosed and the hepatic lymph nodes are dark brown in color .

Differential diagnosis .

● **Acute fascioliasis .**

♦ Haemonchosis .

♦ Infectious necrotic hepatitis .

♦ Anthrax .

♦ Enterotoxemia .

♦ Eperythrozoonosis .

● **Chronic fascioliasis** .

♦ Copper and cobalt deficiency .

♦ Other internal parasitism including parasitic gastroenteritis particularly haemonchosis in sheep and ostertagiasis in cattle .

♦ Johne's disease .

Treatment :

♦ **Triclabendazole** is a specific compound for use against *F. hepatica* in sheep (10 mg / kg) and cattle (12 mg/ kg) . Highest dose are required for *F. gigantica* .

♦ **Albendazole** is broad spectrum antihelmentics also active against nematodes . It is effective against *F. hepatica* at dose rate 7.5 mg / kg in sheep and 10 mg / kg in cattle .

Netobimin (20 mg / kg) is metabolized to albendazole in the body and has similar activity against *F. hepatica* .

- **Closantel** will kill majority of flukes older than 4 weeks in sheep at dose of 10 mg /kg and will delay egg laying by animal grazing contaminated pasture for up to 12 weeks . It is also effective against *H. contortus* .
- **Clorsulon** is supplied in combination with ivermectin . Dose rate is 2 mg / kg by SC injection , it is effective against adults and 12 – 14 weeks immature flukes , but activity against 8 weeks old *F. hepatica* is variable .
- **Nitroxynil** is given SC at 10 mg / kg and has good efficiency against adult flukes but the dose has to be increased up to 50 % to obtain adequate control of acute fascioliasis . It can not be given orally as the rumen microflora reduce the compound to an inactive metabolite .
- **Oxyclozanide** is used orally in cattle , effective against the adult flukes but inactive against the immature forms . This compound has been combined with levamesole .

Control :

Periodic treatment with anti fluke drugs .