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An Overview of Fasciolosis: Impact, Life cycle, and Control Measures in Livestock

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ABSTRACT

Fasciolosis, caused by the liver fluke *Fasciola hepatica*, presents a significant threat to livestock, resulting in substantial economic losses within the industry. This parasitic disease affects various animals, including sheep, goats, cattle, and buffalo, and can even pose a risk to humans as a zoonotic disease. The lifecycle of *Fasciola hepatica* involves complex stages, including transmission through intermediate hosts such as snails. Clinical manifestations range from asymptomatic cases to severe symptoms such as anemia, decreased milk production, and even death. Diagnosis relies on clinical signs, post-mortem examinations, and detection tests such as ELISA. Treatment primarily involves anthelmintic drugs, with Triclabendazole being the drug of choice. Control strategies encompass herd health programs, snail population control, regular deworming, and maintaining proper hygiene. Implementing these measures is crucial for minimizing losses and ensuring the health and productivity of livestock.

Introduction

Parasites pose a great risk to the animals. They cause huge economic losses to the livestock industry. It causes mortality of animals, reduces the fertility of animals and decreases the production of both the meat and milk of animals. There are different parasites which cause diseases in animals. These may be either ecto-parasites or endo-parasites [1]. In case of endo-parasitism various infections in ruminants like Fasciolosis, Schistosomiasis, Giardiasis, Amoebiasis, Ascariasis etc. are of major importance in livestock. In Pakistan, *Fasciola hepatica* is of major concern in the areas close to the canals, rivers or water bodies. It causes a disease named as Fasciolosis in animals. It is a trematode and is commonly known as liver fluke [2].

Morphology

Liver fluke is a leaf shaped trematode. It measures about 3.5cm in length and 1.5cm in width. It is large enough to be seen with the naked eye. Its anterior portion is broader compared to the posterior portion. At the anterior end, a cone is present. Two suckers named oral and ventral are present [3].

Hosts

Fasciola hepatica affects a number of species of animals. The animals which may be infected include sheep, goat, cattle, buffalo, dog etc. Fasciolosis also affects man which means it is a zoonotic disease. Snail acts as intermediate host for the transmission of this disease [4].

Life Cycle

Fasciola hepatica lives in the bile duct. Its life cycle starts from eggs which are passed out in the feces. Hatching of these eggs takes place in the water and these develop into miracidium. It is the miracidium stage which infects the snail. In the snail, this miracidium undergoes further development into sporocyst, sporocyst into radia and radia converts into cercariae. Now these cercariae are released from the snail and attach to the vegetation. On this vegetation, these cercariae encyst to form the metacercariae. Metacercariae is the infective stage. These metacercariae are ingested by the definitive host and reach the small intestine. In the small intestine, these metacercariae excyst and reach the liver tissue by penetrating through the intestinal wall and peritoneal cavity. These further penetrate the liver tissue to the bile duct and become adult. These adult flukes now start laying eggs. These eggs travel to the duodenum with the bile and are passed out of the body of definitive host in feces [5].

Clinical Manifestation

Clinical manifestation of disease depends upon the number of metacercariae ingested. It may be either asymptomatic in cattle or may show severe clinical signs in sheep. It may be either acute or chronic. Acute form is seasonal while chronic form occurs in all seasons. In acute form, there is distended painful abdomen, anemia and sudden death. In chronic form, the signs observed include sub-mandibular edema, dullness, decreased milk production and anemia [6]. Fasciolosis also pre-disposes the animal to Black Disease which is caused by *Clostridium novyi* [7].

Diagnosis and Treatment

Diagnosis is based on history, clinical signs, post-mortem findings and detection tests like ELISA. Oval operculated eggs are also observed in feces. In post-mortem, immature worms in the parenchyma of liver, migratory tracts of worm and adult worms in the bile duct are observed. Plasma level of gamma-glutamyltransferase may also help in diagnosis as its level is increased in liver damage [8,9]. Various anthelmintics are used for the treatment of Fasciolosis in animals. Drug of choice for the treatment of Fasciolosis is Triclabendazole as it is effective against all stage of the *Fasciola hepatica*. Other drugs which may be used are Albendazole, Oxyclozanide, Nitroxynil and Closantel [10].

Control

Control of this disease is thus very important to minimize the losses. Control is directed towards overall herd health program. Limit the spread of disease by controlling population of snails. Treat the infected animals and do regular deworming of the animals. Drain off the land areas close to the shed of animals and spray molluskacides. Hence, we can avoid such parasitic losses in livestock industry by focusing on proper control measures, deworming at regular intervals, rotational grazing and proper hygiene.

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