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Review Paper

HYDATIDOSIS, A PARASITIC ZOONOTIC DISEASE: AN OVERVIEW

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Abstract: Hydatidosis or Echinococcosis is a parasitic disease caused by infection with tapeworms of the genus *Echinococcoccus*. Hydatidosis or Echinococcosis is a cestode infection which is important zoonotic disease of man. Disease in man is caused by metacestode stage or infectious larva of the canine intestinal tapeworm; Echinococcus species. The adult worms are found in dogs and other carnivores. Geographic distribution in recent years, Hydatidosis or Echinococcosis has been recognized as a public health problem of global dimension.

Keywords: Cestode, Hydatidosis, Parasite, Zoonosis.

INTRODUCTION

Hydatidosis is a disease prevalent in all sheep grazing countries i.e. Australia, New Zealand, Middle east countries, Turkey, Greece, USSR, Cyprus, Latin America and the far east. It is believed that there are relatively few countries in which Cestodes of genus *Echinococcus* are entirely absent. Cocci are also known to exist in India, where highest prevalence is reported in Andhra Pradesh and Tamil Nadu than in other parts of country. In some parts of Latin America human infection rates as high as 84.3 per 1 lakh people have been observed. A recent study at Delhi showed that approx 10% sheep slaughtered in Delhi slaughter house were infected with larval forms of parasite. Prevalence of disease was too high [1].

Hydatidosis or Echinococcosis is a parasitic disease caused by infection with tiny tapeworms of the genus *Echinococcoccus*.

Hydatidosis or Echinococcosis is classified as either Cystic echinococcosis or Alveolar echinococcosis.

Cystic echinocccosis, also known as hydatid disease, is caused by infection with the larval stage of *Echinococcusgranulosus*, 2–7 millimeter long tapeworm found in dogs (definitive

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host) and sheep, cattle, goats, and pigs (intermediate hosts). Although most infections in humans are asymptomatic, Cystic echinococcosis causes harmful, slowly enlarging cystsin the liver, lungs, and other organs that often grow unnoticed and neglected for years.

Alveolar echinococcosis, disease is caused by infection with the larval stage of *Echinococcus multilocularis*, 1– 4mm long tapeworm found in foxes, coyotes, and dogs (definitive hosts). Small rodents are intermediate hosts for *E.multilocularis.* Although cases of Alveolar echinococcosis in animals in endemic areas are relatively common, human cases are rare. AE posesa much greater health threat to people than cystic echinococcosis, causing parasitic tumors that can form in the liver, lungs, brain, and other organs. If left untreated, Alveolar echinococcosis can be fatal.

Causative Agent [2]

Echinococcus spp. are small tapeworms measuring about 7 mm in length. At present there are 4 species named as;

1. *Echinococcus granulosus*: It has worldwide distribution and maintained in the domestic transmission cycle involving the dogs has final host. In man the infective larva causes hydatidosis.

2. *Echinococcus multilocularis*: is restricted to the northern avenue. It has been detected in various countries i.e. Iran, Turkey etc. In man, the metacestode causes the “alveolar” type of disease.

3. *Echinococcus oligarthus*: a species occurring in central South America, suspected to cause disease in man.

4. *Echinococcus vogeli*: a species occurring in Central and South America and has been shown to cause polycystic hydatidosis.

LIFE CYCLE

Basically it is a “dog – sheep” cycle with man as an accidental intermediate host. The adult tapeworm lives in the small intestine of dog, which is definitive host for 2 – 4 years. The eggs are voided in the feces and contaminate the soil vegetation and drinking water. They are highly resistant and can survive for several months in pastures and household. Sheep, Cattle and other intermediate host become infected when they use vegetation which has been contaminated with feces from infected dog. Ingested eggs hatch in the intestine and larvae penetrate the intestinal lining and migrate to various organs as liver, lungs and brain and develop into hydatid cyst. The life cycle is completed when sheep or cattle viscera containing

hydatid cyst are eaten by dogs. Infected dogs begin to pass of the parasite approximately 7 weeks after infection. Man does not harbor adult worm [3].

SUSCEPTIBLE HOSTS

It is becoming increasingly evident that human behavior especially in relation to dogs and cats, uncontrolled slaughter of food animals, indiscriminate disposal of offal and carcasses and eating habits of the people play an important role in epidemiology of disease. Human infection is acquired usually in childhood through contact with infected dog. The impact of Hydatidosis can be described only in terms of human suffering, cost of medical diagnosis, hospitalization and surgery, man days lost as well as in terms of temporary or permanent incapacity. The retarded growth of animals and reduction in the quality and yield of meat, milk, wool and condemnation of offal are also very important point. Hydatid disease is an occupational disease of certain groups i.e. Shepherds and their family in the endemic areas and shoe makers [4].

MODE OF TRANSMISSION IN MAN

Human infection occurs by ingestion of Echinococcus with food, unwashed vegetables and water contaminated with feces from infected dog. Infection can also take place while handling or playing with infected dogs i.e. Hand to mouth or by inhalation of dust contaminated with infected eggs [5].

INCLUBATION PERIOD

Incubation period varies from months to years depending upon number and location of cysts.

CLINICAL SYMPTOMS

In man, symptoms of hydatid disease are usually manifested several years after exposure. Cyst grows from 5–20 years before they diagnosed. Size of the cyst may vary from a pin head to that of small football. It is estimated that more than 70% of the cyst become located in the right lobe of the liver and the rest in lungs, brain, peritoneum and kidney. The cysts are filled with watery fluid and contain large number of tapeworm heads. Cysts of small size generally cause asymptomatic infection. Large cysts however cause Jaundice. In vital organs they may cause severe symptoms and death [6].

DIAGNOSIS

1. Clinical: Based on history of residence in an endemic area, close association with dogs and the presence of slowly growing cystic tumour.

2. X-ray: A plain X-ray permits the location of the cyst. Modern techniques of diagnosis include ultrasonography and CT scan.

3. Serological test: Serological test with a high degree of sensitivity and specificity has been introduced, such as, Indirect Immunoflourescent test. ELISA is regarded as relatively simple method with a high sensitivity superior to that of some serological procedure.

4. Intradermal Casoni's test still in wide use since it is simple to perform the test [7].

TREATMENT [8]

1. There is no specific treatment except surgical removal of cyst.

2. Mebendazole and Praziquantel may be used.

PREVENTION AND CONTROL [9-10]

1. Preventing dogs from gaining excess raw offal at slaughter houses and on farms to bed animals. This involves control of slaughter houses, proper meat inspection and destruction of infected viscera.

2. Control of dogs: This involves elimination of stray dog, drastic reduction of dog population and effective dog registration system, surveillance of dogs based on periodic stool examination after administration of Arecholine hydrochloride followed by isolation and treatment of praziquantel. A single oral dose of 5 mg/kg body wt. will remove all adult worms from the dog.

3. Health education of the public: Particularly Butchers, Dog owners, Animal breeders and Shepherds are the basis of effective prevention.

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