

Review Article

Pulmonary Echinococcosis

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Abstract

Human Echinococcosis is an old disease described in ancient times by Hippocrates as a cyst full of water in the liver. Rudolphy was the first to use the term hydatid disease in human in 1808. Hydatid disease is a zoonosis caused by the tapeworm of *Echinococcus* spp. The hydatid disease is prevalent where livestock is raised in association with dogs. The human being is affected by the disease when man accidentally swallowed the eggs of the parasite *Echinococcus* releasing the larva in that will migrate to various body organs. Political instability in endemic areas of hydatid disease like Syria and Iraq are expected to increase the spread of the disease and this effect will not appear now. The immigration of large number of people to other countries in Europe will make the diagnosis and control of the disease more difficult.

INTRODUCTION

Echinococcosis (hydatid disease) is a zoonotic parasitic disease of human and mammals caused mainly by the larval stage of dog tapeworm *Echinococcus granulosus*. The common sheep/dog cycle is usually considered as the major source of human contamination. The definitive hosts (dogs) harboring the adult worms in their intestinal tract without causing symptoms. The worms pass eggs in the dog stool, which are ingested by herbivores or humans; the eggs hatch releasing larvae (oncosphere) that invade through the intestinal wall and evolve to hydatid cysts [1-3]. The parasite is prevalent in areas where livestock is raised in association with dogs including Australia, Latin America, Eastern Europe, Africa and the Middle East [4].

Life cycle

The adult worm inhabits the small intestine of the definitive host, has three proglottids which contain large number of eggs which pass out in feces of dogs, and these eggs can survive for one year, flies and wind help to spread these eggs.

Once these eggs are swallowed by the intermediate host the embryos will enter the portal circulation and will travel usually to liver and lung where they develop into cysts filled with fluid and protoscolices formed from the germinal layer of the cyst which can grow into daughter cysts. An alternative path to the lung is the intestinal lymphatics with the entry into the circulation by the way of the thoracic duct, possible eggs inhalation as a cause of primary lung disease [5]. Pulmonary hydatid may occur following ruptured hepatic cyst. When the daughter cysts are ingested by the definitive host they grow to mature worm in 4-7 weeks.

Epidemiology

The prevalence of the disease in humans and animals is not well known in most countries. However, some assessments show that prevalence in humans is quite high. Moreover, following

the introduction of modern diagnostic techniques such as serology, radiography, ultrasonography and computer scanning, it has become evident that asymptomatic cases of hydatid disease are common.

In endemic areas dogs, cats and other domestic animals are in close contact with humans, poor hygienic conditions, consumption of uninspected meat and products of animal origin is common. Many animals are slaughtered in fields where the parts unsuitable for consumption are rejected and are eaten by dogs or other carnivores.

In some countries the contaminated entrails of the slaughtered sheep and goats usually are treated chemically and buried underground. Moreover, getting rid of stray dogs together with that maintain good hygienic conditions. This makes the occurrence of this disease unlikely [6].

In most endemic areas the lung is the second organ to be affected by the disease, in our study about hydatid disease in Qatar the lungs were involved in 16% of cases [6], this was similar to the incidence in Greece [7].

Presentation

Pulmonary hydatid disease is usually asymptomatic, it might be discovered accidentally during chest X-ray examination. The radiological findings with unruptured pulmonary cysts are one or more homogeneous oval, sharply demarcated mass lesions [Figure 1]. They range in size from 1-20 cm [Figure 2,3] and occur particularly in the middle and lower zone [Figure 3]. Hepatic cysts are found in approximately 10% to 25% of cases of pulmonary hydatid [8]. Moreover, pulmonary hydatid disease affects the right lung in approximately 60% of cases, 30% exhibit multiple pulmonary cysts, 20% bilateral cysts, and 60% are located in the lower lobes [9].

Occasionally, an unruptured cyst results in cough, hemoptysis, or chest pain [10]. One of our patients was diagnosed as asthma

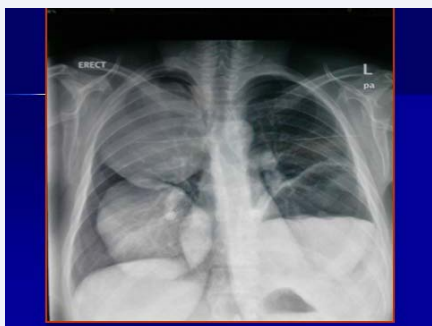


Figure 1 Chest X-ray showing two intact hydatid in the left lung and one ruptured Cyst in the right lung.



Figure 2 Pulmonary hydatid removed by surgery.



Figure 3 Hydatid of lung before removal.



Figure 4 MRI showed two intact pulmonary hydatid and one hepatic cyst.

and was treated with bronchodilator for one year with no improvement [11]. Subsequent clinical features of Echinococcal granulosis infection depend upon the cyst site and size. Small cysts may remain asymptomatic indefinitely, but cysts may enlarge to more than 20 cm in diameter and cause symptoms by compressing adjacent structures. However, symptomatic hydatid disease of the lung more often follows rupture of the cyst.

The cyst may rupture spontaneously or as a result of trauma or secondary infection [12]. Symptoms may result from the release of antigenic material and secondary immunological reactions that develop following cyst rupture ranging from urticarial and wheezing to life threatening anaphylaxis though fatal anaphylaxis is uncommon [5].

Diagnosis

In the majority of cases of pulmonary hydatid disease serology and radiological investigations are helpful for establishing the diagnosis. Plain chest x-ray can show the cyst clearly and can show ruptured cyst. CT confirms the diagnosis by detecting the presence of daughter cysts with sensitivity 90-97% [13]. MRI demonstrates the features of the cyst adequately [Figure 4]. Fluorodeoxyglucose positron emission tomography may allow distinction between metabolically active lesions and non enhancing metabolically inactive cases [14]. Eosinophilia was seen in 24% of our patients in Qatar [6]. Serology, Cystic echinococcosis is one of the few parasitic infections in which the basis for laboratory diagnosis is primarily serology [15]. In our patients serology was positive in all patients [6].

Treatment

Surgery remains the treatment of choice for hydatid disease of the lung and a parenchyma-saving operation together with albendazole administration are highly effective.

CONCLUSION

Cystic echinococcosis is the most common parasitic disease of the lungs and it is a public health problem of worldwide importance [16]. The political instability in endemic areas in the middle east is going to affect the control of the disease and its spread in the population because of the collapse of health system, this effect will not appear now because of the slow growth of the cysts. The migration of the people from endemic areas to Europe will lead to re emergence of the disease in the European countries. Progress in control can only be expected if health authorities attribute a higher priority to this disease and implement modern diagnostic and control options.

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