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Hydatid disease of liver: A Review

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Abstract

Hydatid human disease is mainly caused by infection with the larval stage of Echinococcus granulosus. It is an important parasitic infection of humans, which follows the accidental ingestion of eggs excreted in the feces of infected dogs. It is found in all over the world mostly in grazing areas. This is asymptomatic but with the passage of time form fluid filled cyst that effect major organs like liver, lungs, heart, brain and bones etc. These cysts may burst and cause life threatening problems. Other symptoms include loss of apitite, anemia, weakness, weight loss, vomiting, abdominal pain, jaundice and shortness of breath.

To review the hydatid disease of liver, so that physician should understand the pathology, manifestations and treatment of this disease and will help control the disease in future. We performed PUBMED, EMBASE, and CENTRAL searches for research papers of hydatid disease. Surgical removal of cysts is the treatment of choice. In operable case, mebendazole and albendazole should be prescribed.

Keywords: Hydatid Disease, Liver, Treatment of Hydatid Disease, Literature Review

Introduction

Hydatid disease is also known as echinococossis and hydatidoses. It is zoonotic disease caused by ova of Echinoc gyanulosus [1]. Tapeworm infect dogs and other carnivores. Humans get infection from animals that are infected with this tapeworm and also with ingestion of parasitic eggs found in contaminated food, water or soil. this infestation occur in world wide.Life cycle of this parasite involves only 2 hosts, one definitive and the other intermediate [2]. Humans act as an accidental intermediate host. The intermediate host ingests the eggs, which hatch into larvae, which infest the liver, lungs, muscles, and other organs of the intermediate host [3, 4].

Tapeworms live in the guts of animals or humans. It is a hematogenous infection in the larval stage of tapeworm stuck in some certain sides of body where they develop fluid filled sac called hydatid cyst. The cyst may form in major viceras mainly in liver and lungs but also occur in heart, brain and bones. Immature forms of tapeworm exist in cysts and their size can increase ranging from 5 to 10 cm. With the passage of time many cysts may die but some can exist for many years and cause serious complications.

Cysts have daughter cysts if they are unleashed then spread throughout the body. It is a serious potentially fatal disease. Hydatidoses are not contagious and not spread by person-to-person

contact. This disease is found in regions where dogs are kept in houses and people remain in contact with dogs. Discharge of dogs has ova that are responsible for communication of disease to human [5]. Sometimes, this disease occurs in people who eat salad on which ova is deposited [6]. This paper is an attempt at a meta-analysis searching for research papers on hydatid disease.

There is an introduction about nature and development. The treatment about operative procedures is discussed extensively. There appear to be radiological images and indeed the radiological aspects of this condition are considered. Surgical removal of cysts is the treatment of choice. In operable case, mebendazole and albendazole should be prescribed.

Incubation Period

It varies from 12 months to years in man, depending on number of cysts and their locations and how rapid they grow.

Dogs begin to pass eggs 5–7 weeks after infection.

Pathology

The larval stage of E. granulosus enters liver through portal vein and form large, fluid filled cyst, usually in the right lobe [7]. Hematogenous spread occurs primarily in liver. Other viscera are also infected including 20% brain and 20% bone. Tissue assemblage and proliferation occurs in slowly enlarging cysts. In 80% of cases a solitary cyst in a single organ affects the individual. A primary cyst of liver is complex of three layers. Adventia (pseudo cyst), Laminated membrane(ectocyst) and Germinal epithelium(endocyst).

Structures of Hydatid Cyst

Hydatid liver cyst comprised of three layers. Ectocyst is found externally and is made up of fibrous tissues. Middle layer and is made up of proteinaceous material. Endocyst is innermost layer of cyst [8, 9]. Hydatid cyst contains hydatid fluid that is crystal clear and contains hooklets and scolices. Hadtid cyst also contains brood capsule that develops within the cyst by geminal epithelium and is attached by pedicles. Within brood capsule, scolices (head of future worms) develop.

When the laminated the laminated membrane becomes damaged, it disintegrates, and brood capsule becomes free and grows into daughter cysts. Mother cyst ceases to exist, and hydatid fluid and its content are confined by adventitia only. Exogenous daughter cysts are formed when germinal layer protrudes outward the external side of cyst which if left untreated cause recurrence after remission. The hydatid cyst is growing slowly approx. 1 to 3 cm/ year.

Signs and Symptoms

Parasite may die, fluid is absorbed and all that remains is an encapsulated, laminated, bile-stained membrane. In long standing cases, cyst wall may calcify. Usually, cysts enlarge gradually and become manifest by their size. Complications arise [10]. stated the complication related to pleura. stated the complications related to central nervous system [11]. Clinical presentation is often non-specific and may be asymptomatic.It takes months to year to develop symptoms after ingestion of egg. Nonspecific signs include loss of appetite, loss of weight and weakness.

Mostly signs and symptoms depend on the site of hydatid cyst and pressure exerted on surrounding tissues and may include nausea vomiting, abdominal pain and shortness of breath. If lungs are affected, signs include chronic cough. Right hypochondrium pain occurs. Jaundice is seen in some patients. Other features include skin rashes, pruritus and allergic reactions and fever. It may rupture into peritoneal cavity, alimentary canal, biliary channels and plural cavity [12].

Diagnostic Investigations

Clinical diagnosis is made on association of man with dogs and showing slowly growing cystic tumor. X-ray, computerized tomography, ultrasound will locate the hydatid cyst. . Blood tests to check the patient's immune response to parasite may be helpful. Biopsy and ultrasound guided puncture may also be performed for differential diagnosis of cyst from abscess and tumor. Serological test is specific and sensitive. They are the immunofluorescent test and ELISA test. Casoni intradermal skin test is simple and is performed with ease.

But the test cannot be said to be highly specific. Sera negative persons may require microaspiration under ultrasound guidance and anthelmintic coverage to avoid leakage and anaphylactic reaction. The aspirated specimen under microscope will reveal thick laminated cyst wall and brood capsule as well as the structure of protoscolex with hooks [13-16].

Immunity

Innate immunity develops in the form of active cellular reaction consisting of macrophages, giant cells and eosinophils. Humoral immunity also develops as evidenced by serological tests, but its exact nature and mechanism is uncertain.

Treatment

It is complicated to treat the disease. Treatment depends on the size and location of the cyst. Drugs that kill the tapeworm are used in some situations and drug may inject in cyst. Surgery is the most common treatment for removing cyst. Percutaneous treatment of cyst with PAIR (puncture, aspiration, injection, re-aspiration) technique is also used.

Drug Treatment

It has little value except in recurrent cases, with multiple cysts, and when spillage occurs during operation.

(A). Mebendazole (Erizole) 400-600 mg TDS for 21-30 days

(b) Albendazole (Generic Name), (Zental), is a safer alternative.

Operation

Treatment of cystic hydatid disease has traditionally involved surgical removal of cysts. But care should be taken so that cysts remain intact. Cysticidal agents are used to prevent the spread of infection in case of rupture of cyst during operation. The cyst is exposed by an incision that gives best access. Abdominal packs are arranged extremely carefully and precisely, so as to isolate infected portions of liver from peritoneal cavity. A large pack, swapped out in solution of either hypertonic NaCl or Na-hypochlorite is placed around exposed liver. The cyst is aspirated and a suitable quantity of a scolicidal solution is injected, so as to render the cyst of about three quarters full [17-21].

Treatment of Hydatid Disease in Childhood with Mebendazole

Conducted a study to investigate the efficacy of mebendazole therapy in comparison with surgery [22]. Fifty-six patients

were selected for study. Diagnosis was done by ultrasonography and pulmonary radiograms. Initially cysts were confined to the lungs. Surgically treated patients were twenty-seven. Recurrence occurred in eight patients after a mean period of 3.6 yrs. Mebendazole was administered regularly to thirty patients. Dose of mebendazole was 50 mg/kg. 11.7 months were the mean duration of treatment. Cured patients were twenty-one patients and they discontinued the mebendazole therapy.

Nine patients continued the mebendazole therapy and dramatic improvement was observed in seven patients. Minimal radiographic changes were observed in the other two patients. Minimal scars were left after vanishing of the lung cysts. Liver cysts were turned into inactive forms. Age, duration and severity of the disease were similar in both treatment groups. The recurrence rate of surgically treated children was more than drug-treated children [22].

Postoperatively

Reported that Mebendazole is effective in hydatid disease and prevents recurrence [23, 25].

Prevention and Control

Entrails of slaughtered sheep should not be fed to dogs. My hands should be washed before eating. The public should be educated about the risk of exposure to dogs and environmental contamination of their feces.

Wash fruits and vegetables before use. Wash your hands before eating anything. After handling pets wash your hands thoroughly. Avoid direct contact with objects that are soiled with dog faces. Do not kiss dogs and don't allow them to lick people's face Viscera of sacrificed animals of intermediate hosts should be properly disposed so that dogs may not have access to it.

Pet dogs should be periodically put to deworming preferably every six months. Surgical resection is the most common procedure. If primary cyst ruptures in surgery, praziquantel (biltricide), a protoscolicidal drug reduces the possibility of secondary cysts. The use of mebendazole (vermox) and albendazole (zentel) have been used successfully and may be the preferred treatment in many cases before surgery is attempted.

Conclusion

Operative procedure is the best choice for treatment of hydatid cyst. Other treatment strategies are percutaneous drainage and medical treatment using benzimidazole compounds (albendazole, mebendazole).

Ethics Statement

This is a review article and there is no need of approval from ethical committee

Conflict of Interest

There is no conflict of interest

Disclosure Statement

None of the authors have a financial or proprietary interest in the subject matter or materials discussed in the manuscript, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

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