

HYDATID DISEASE IN CHILDREN: A different pattern than adults

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ABSTRACT

Hydatidosis is endemic in Iran. We studied hydatid cyst pattern in children, compared it with adults and present our experience. In 40 children, 76 cyst were found. There were multiple large lung cysts unilateral or bilateral in children. In the liver, the chief complaint was abdominal pain and in the lung it was chest pain and asthma-like symptoms. Lung cysts were operated first and liver cysts were postponed for 3-6 months in patients who had both liver and lung involvement. All patients were prescribed albendazole for 10 days before surgery and continued for three months. The patients were followed up by abdominal ultrasonography and chest-X-Ray every 3 months. We didn't use any scolical agents intraoperatively. Contrary to adults, incidence of involvement is equal in lung and liver (41% and 43%). Combined lung and liver involvement is more frequent in children than adults (16% vs. 4%). However, surgical complications are less frequent in children and their outcome is better.

KEY WORDS: Hydatid disease, Children, Cyst.

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INTRODUCTION

Hydatidosis, also known as cystic Echinococcosis (CE), is a parasitic infection of the liver and other organs by the flatworm *Echinococcus granulosus*.¹ Hydatidosis is the most frequent cause of liver cyst in the world.² The ingested ova borrow through the intestinal mucosa and travel to the liver through the mesenteric vein. A few ova may pass the liver and get trapped in the lungs.³ Synchronous pulmonary and hepatic hydatid disease may occur in 4% to 25% of cases.⁴ Hydatid cyst can

be seen in other organs for example heart, pancreas, spleen, CNS and etc.⁵⁻⁸ Hydatid disease can invade the inferior vena cava.⁹ Hydatidosis is also the most frequent parasitic lung disease.¹⁰ In a large study the most common symptom was chest pain 79/1% and in 86% of patients the cysts were unilateral.¹¹ Surgery is necessary in most cases but it must be conservative with preservation of the organ and ablation the cyst cavity. Complex forms, such as disseminated disease and secondary lung hydatidosis (metastasis or bronchogenic) are difficult to treat and may be considered malignant.¹⁰ The most common complication was residual pleural space and delayed air leakage.¹² But surgery of pulmonary hydatid disease remains the best treatment which aims to remove the cyst or its remnants and obliterate the residual cavity.¹³ Benzimidazole carbamates are effective against CE.¹⁴ Albendazole a more recently developed benzimidazole is more effective than mebendazole.^{1,14} Administration of albendazole for 4 to 8 weeks may decrease the incidence of recurrence.³ Trauma as a cause of

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hydatid cyst rupture leads to various clinical sequelae,¹⁵ as anaphylactic shock or dissemination of disease that was seen in Iran. Computed tomography is currently the most sensitive diagnostic tool for demonstrating hydatid cyst rupture.¹⁵ Hydatid cyst is endemic in Iran. There are many studies of Hydatidosis in adults, but only few articles regarding rate and pattern of involvement in children have been published. In this article, we studied hydatid cyst pattern in children and compared it with adult's type in our experience and their outcome. We hope this report to be useful for early diagnosis and treatment of the disease in children to prevent associated morbid complications.

PATIENTS AND METHODS

This study is a retrospective and descriptive study performed in hospitalized patients under age 15 years in Imam Khomeini Medical center in Ahwaz, Iran from 1994 to 2000 who were operated for Hydatid cyst. Data was collected by searching through patients' files in hospital archives, considering different factors such as age, sex, location of involvement, cyst size, symptoms, managements and outcome. Then, all patients were followed up in surgical outpatient clinic by surgeon that operated the patient and all relevant information was recorded in their files, for four years. Then, all the collected data was analyzed and results compared with the similar studies done earlier.

RESULTS

In 40 children under 15 years (24 male, 16 female), a total of 76 cysts were found. Albeit some cases had more than one cysts in one or more organ simultaneously. Twenty five

Table-I: Relation between size and site of Hydatid cyst

Site	Liver	Lung	Other organs	Sum
5cm	16(22%)	9(13%)	4(6%)	29
6-10	11(15%)	22(29%)	1	34
11-15	6(8%)	4(5%)	1	11
16-20	1(1%)	1(1%)	-	2
Sum	34	36	6	76

Table-II: Relation between size of hydatid cyst and age of patients

Age(Year)	Size (cm)				Total
	5	6-10	11-15	16-20	
1-5	4(5%)	6(8%)	1(1%)	---	11
6-10	21(27.6%)	20(26%)	5(6.5%)	---	46
11-15	4(0.5%)	8(11%)	5(7%)	2(3%)	19
Total	29	32	9	2	76

patients hailed from urban and 15 from rural area. Isolated liver was involved in 17 cases while the lung was involved in another 17 cases. Remaining 6 cases had multiple organs involved along with liver or lung. Details about size and site of hydatid cyst is mentioned Table-I.

Interestingly in the lung group two patients had more than one cyst in one lung and two others had more than one cyst in both lungs. Details about size of hydatid cyst and age of patient is shown in Table-II. All patients were successfully operated. In the liver Group 9 patients had at least two cysts in the liver. The main complaint in 22 patients was abdominal pain, 14 patients had abdominal mass, 22 had chest pain and 8 had asthma-like symptoms. Ten patients (6 in lung, 4 in liver) were asymptomatic who were discovered incidentally during workup for another reason. In patients who had both lung and liver involvement we operated on the lung by thoracotomy first and laparotomy for liver cyst was postponed for 3-6 months.

In one case that had bilateral lung cysts (Fig-1, 2), Right thoracotomy was followed by left thoracotomy in three months. All 36-lung cysts during thoracotomy underwent drainage of cyst, removal of germinative layer, repair of air-leak and finally obliteration of cavity by capitonage. Out of 34 liver hydatid cyst 28 underwent omentoplasty while the remaining 6 were managed by external drainage due to huge cyst, small and inappropriate omentum or difficult cyst location behind the liver. In the remaining 6 cases who had hydatid cyst in other organs 3 in spleen, two in omentum and one in pelvis, all were operated on splenectomy, omentectomy and removal of cyst respectively. We did not find any serious postoperative



Fig-1: Chest radiography of a 6 year old girl with multiple cysts bilaterally.



Fig-2: CT scan of the same patient with the liver cysts

complication, including chronic air-leak in thoracotomy cases or bile-leak in liver cases. But postoperative atelectasis was common which were treated by chest physiotherapy and in some cases with bronchoscopy by lavage, suction of airway secretions and mucus plaques. We had no mortality. All patients were given albendazol 20mg/kg orally daily for at least three months. All patients were followed by abdominal ultrasonography and chest-x-Ray every three months. No cyst recurrence or major chronic complication was noted during 48 months follow up. We did not use any scolicalid agent in our operations. We carefully isolated cyst during surgery to prevent possible leaks, by drainage or intact removal of cyst.

DISCUSSION

Hydatid disease is generally caused by the larval stage of infestation of the dog tapeworm, *Echinococcus granulosus*.³ Despite equal distribution of the disease in both sexes in adult population.^{1,2} In our study it was more frequent among males in children. Contrary to our expectations, the disease was more prevalent in urban population (59% urban vs. 41% rural). This emphasizes the need for more sanitation in both rural and urban areas. This is also a warning for health organizations to imply firm policies to stop the cycle of the parasite in cities. Contrary to adult population organ involvement in decreasing order, liver (70%), lung (25%), we found almost equal incidence in lung and liver in children (41% and 43% respectively).¹⁶⁻¹⁸

Combined lung and liver involvement is more frequent in children (16%) than adults (4%).¹⁷⁻²⁰ It seems that in children scolexes have more ability to pass from liver barriers than adult. It may be due to less density of the liver in children. In adults usually cysts larger than 5cm become symptomatic and then diagnosed, but in children we found 40% were symptomatic with cysts smaller than 5cm. This may be due to small visceral capacity in children. In two cases we found cysts size were 16-20cm which contradicted the theory that hydatid cyst grows 1cm every year.¹ Interestingly, in children large lung cysts (6-10cm) are common (29%) which should be further evaluated.^{21,22} Since multiple organs involvement is more common in children, once a cyst is detected in one organ one has to search and rule out other organs for involvement, especially lungs before any surgery, due to increase risk of anesthesia. Occasionally bilateral involvement of lungs is seen. Twenty seven percent of our cases were asymptomatic and detected incidentally. As in adults, the most presenting symptoms in liver and lung were abdominal pain (73%) and chest pain (57%) respectively.²

In our experience we had no major morbidity or mortality. With early diagnosis and proper managements hydatid cyst in children has an excellent outcome.

CONCLUSIONS

In conclusion hydatid cyst involvement in children in liver and lungs has a different pattern than adults. Simultaneous involvement

of both liver and lung is more frequent in children. Surgical complications are less frequent and their outcome is better. However, more extensive studies and longer follow-up is necessary for better understanding about its recurrence, need for use of scolicalid agents and drugs.

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