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Original Article

Hydatid disease in Iranian children

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Background and Purpose: Hydatidosis is a major public health problem that can cause significant morbidity and mortality; however, it is possible to control and even eradicate the disease. This study was carried out to investigate pediatric hydatidosis in Iran.

Methods: Data were collected from the records of 31 patients admitted to the Children Medical Center Hospital in Tehran, Iran, with hydatidosis from 1995 to 2005. Data collected included demographic data, and information on clinical manifestations, type and site of cysts, laboratory results, and therapeutic procedures employed.

Results: Eighteen patients (58%) were male and 13 (42%) female. The mean age of patients was 8.3 years. On serological study, almost all patients (96%) were found to be positive for hydatidosis. Sixteen cases (52%) had a history of contact with dogs or sheep, and 6 (19%) had parents who were farmers. Cysts were found in the lungs and livers of 24 (77%) and 15 cases (48%), respectively, with 8 cases (26%) having simultaneous liver and lung cysts. Three patients (10%) had multiorgan involvement. The significant clinical manifestations of pulmonary hydatid cysts were cough (92%), fever (83%), and dyspnea (46%). Fever (100%) and hepatomegaly (87%) were the most common symptoms in cases with hepatic cysts. All patients underwent surgery and treatment with albendazole, and recurrence was observed in 2 cases (6%).

Conclusions: Hydatidosis is endemic throughout Iran. Thus, there are reasonable grounds to suspect hydatid cyst infection in patients presenting with cysts in any organ with either an appropriate residential or travel history or in the case of children, with parents in occupations such as sheep raising.

Key words: Child; Echinococcosis; Iran

Introduction

Hydatid disease is a parasitic infection that is widely endemic in Middle Eastern countries such as Iran [1]. The hydatid cysts of *Echinococcus granulosus* usually appear in the liver or lungs, but may also be found in other organs of the body, including the bones, heart, and brain [1-3]. The parasite is usually transmitted to adults through uncooked foods, but in children infection commonly takes place via accidental contamination from direct contact with the feces of dogs [4,5]. Hydatidosis is an important public problem in many parts of the world, especially in rural areas where sheep and cattle are raised [5,6]. Early diagnosis by serology and imaging techniques, and early medical and surgical intervention are the key to successful management of hydatidosis [1, 2]. This study was conducted to investigate the relatively high prevalence of hydatid disease in Iran, in light of the lack of general knowledge about the disease.

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Methods

A retrospective, descriptive study was carried out on the 31 patients diagnosed with hydatidosis among the 71,600 patients admitted to the Children Medical Center Hospital in Tehran, Iran, during the 10 years from 1995 to 2005. Demographic data, clinical manifestations, type and site of cyst, and therapeutic procedures employed were noted. Radiological data, including plain and lateral chest X-rays, computed tomography (CT) of the thorax and abdomen, and abdominal ultrasonography (USG) records, were collected from

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Table 1. Geographic distribution of the hydatid cases studied

Geographic area	No. of cases (%)
North	3 (10)
Northwest	4 (13)
Northeast	2 (7)
West	1 (3)
South	1 (3)
Southwest	1 (3)
Southeast	1 (3)
Central area	18 (58)
Total	31 (100)

the files. The Children Medical Center Hospital is a teaching hospital under the Tehran University of Medical Sciences and is a referral tertiary care centre. It admits patients from all over Iran and from a wide spectrum of socioeconomic levels.

Results

Among the 71,600 patients admitted to our hospital during the 10 years from 1995 to 2005, 31 patients (0.04%) were diagnosed with hydatidosis. The majority of the patients were male (18, 58%), and 13 patients (42%) were female. The mean age of these patients was 8.3 years. Most patients lived in the central areas of Iran (58%); 16% were from the west and northwest, and 10% were from the northern area (Table 1). Many patients (16, 52%) showed a history of contact with dogs or sheep, and 19% had parents who were farmers. Cysts were found in the lungs and liver in 77% and 48% of the cases, respectively. Eight cases (26%) had simultaneous lung and liver cysts, and 3 patients showed multiorgan involvement (Table 2). CT scan was done for 14 cases and all of them showed positive results for

Table 2. Site, number, and size of cysts in patients with hydatidosis

Case no.[a]	Lung cysts		Liver cysts	
	No. of cysts	Diameter of largest cyst (cm)	No. of cysts	Diameter of largest cyst (cm)
1	2	6.0	1	2.0
2	0	-	2	5.0
3	0	-	3	7.0
4	1	3.0	0	-
5	1	3.0	1	6.0
6	1	3.0	1	3.0
7	0	-	1	6.0
8	1	3.0	0	-
9	1	4.0	0	-
10	1	5.0	1	7.0
11	2	3.0	1	3.0
12	1	2.0	0	-
13	1	2.0	1	3.0
14	0	-	3	5.0
15	0	-	2	6.0
16	1	3.0	0	-
17	0	-	1	8.0
18	1	8.0	1	4.0
19	1	3.0	0	-
20	0	-	1	8.0
21	1	7.0	0	-
22	2	9.0	0	-
23	1	10.0	0	-
24	1	4.0	0	-
25	1	2.0	0	-
26	1	2.5	0	-
27	1	2.0	0	-
28	1	3.0	0	-
29	1	4.0	1	2.0
30	1	7.0	0	-
31	1	4.0	0	-

[a]Cases 6, 10, and 13 had multiorgan involvement.

Table 3. Clinical signs and symptoms in 24 patients with lung hydatid cysts

Characteristic	No. of cases (%)
Cough	22 (92)
Fever	20 (83)
Dyspnea	11 (46)
Chest pain	10 (42)
Hemoptysis	2 (8)
Tachypnea	1 (4)
Perspiration	1 (4)

Table 4. Clinical signs and symptoms in 15 patients with liver hydatid cysts

Characteristic	No. of cases (%)
Fever	15 (100)
Hepatomegaly	13 (87)
Abdominal pain	10 (67)
Weight loss	9 (60)
Anorexia	2 (13)
Nausea	2 (13)
Vomiting	2 (13)
Hematemesis	2 (13)

hydatid cysts. However, USG was positive for only 15 patients (48%). Single unilocular cysts in the lungs and liver were seen in 15 (48%) and 3 patients (10%), respectively (Table 2). Three cases had multiple cysts in the lungs, with the largest one being 9 cm in diameter. Four patients had multiple cysts in the liver, with the largest being around 7 cm in diameter (Table 2).

The most common clinical manifestations of pulmonary hydatic cysts were cough (92%), fever (83%), dyspnea (46%), and chest pain (42%) [Table 3]. In patients with hepatic hydatid cyst, fever (100%), hepatomegaly (87%), abdominal pain (67%), and weight loss (60%) were the prominent signs and symptoms, while anorexia (13%), nausea (13%), and vomiting being less frequent (Table 4). Almost all cases (25/26, 96%) were positive for the immunofluorescence antibody. White blood cells were in the range 1300-21,800/μL, with a mean value of 9649/μL and a neutrophil predominance. Some patients (19%) showed eosinophilia >27%. Erythrocyte sedimentation rate (ESR) was in the range 10-120 mm/h, with a mean of 67 mm/h. Seventy one percent of cases (17/24) had ESR >50 mm/h. All patients underwent surgery and treatment with albendazole, and recurrence was seen only in 2 (6%) of the cases.

Discussion

Hydatid cyst disease is an extensive epidemiological problem in developing countries like Iran, particularly in the cattle- and sheep-raising areas. In our study, the incidence of hydatid disease was higher in males (58%) than in females (42%), and increased with age. Studies by Sadeghian in Iran [7], Kandeel et al in Egypt [8], and Gabriele et al in the Mediterranean [9] have shown similar results; however, a study by Tiaoying et al in China found a higher prevalence in females [10]. Almost 60% of the patients studied were living in the central areas of Iran, and 16% were from the west and northwest of the country. Two previous studies had reported cases only in western Iran [11,12]. More than half the cases studied (52%) had a history of direct contact with dogs or sheep and 19% had parents who were farmers. The most probable cause of infection in other patients might be contamination from uncooked foods or raw vegetables. This finding implies that risk factors associated with hydatid infection could include dog ownership, the frequency of contact with dogs and sheep, and certain occupations. The most frequently affected organ in children was the lung (77%). This is in contrast to adults, in whom the liver was found to be the most infected site [13,14]. CT scans demonstrated hydatid cyst infection in all patients for whom the procedure was carried out (14/14); however, USG only had 54% positive diagnostic yield. USG techniques are useful for defining most cysts in the abdomen, but most of the cases studied had lung involvement. The majority of the patients (61%) had a single organ cyst. Multiple cysts in a single organ were seen in 22.5% of the patients. The most common clinical manifestations of pulmonary hydatid cysts were cough (92%) and fever (83%). The most common clinical symptoms in hepatic cases were fever (100%) and hepatomegaly (83%). The incidence of these symptoms was similar to the results of previous studies in other regions [7-10]. Surprisingly, 96% of the cases (25/26) showed positive results for the immunofluorescence antibody. Serological studies can, thus, be useful in confirming the diagnosis of echinococcosis, even though the possibility of false-negative results associated with the procedure have been reported to be as high as 50% in cystic hydatid disease of lungs or when only young, intact liver cysts are present [6]. The ESR values of >50 mm/h seen in many cases (71%) could be due to bacterial superinfections. Some patients (19%) even showed eosinophilia, even though eosinophilia is more often absent in patients with hydatid disease [4]. In order

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to reduce postoperative complications and the recurrence rate after surgery, all patients were given a single-course treatment of albendazole prior to undergoing surgery.

Hydatidosis is an endemic disease throughout Iran. Thus, there are reasonable grounds of suspecting hydatid cyst infection in patients presenting with cysts in any organ with either an appropriate residential or travel history or in the case of children with parents in occupations such as sheep raising.

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