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Short Communication

Epidemiological and Clinical Characteristics of Patients with Hydatid Cysts in Khorasan Razavi Province, from 2011 to 2014

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Abstract

Background: This study aimed to investigate the epidemiological and clinical aspects of patients with hydatid cyst during 2011 to 2014.

Methods: This cross-sectional study was conducted in Khorasan Razavi Province, the Northeast of Iran, from 2011 to 2014. The study population was all cases with hydatid cyst who diagnosed in governmental and private laboratories, hospitals and health centers (HC) in Khorasan Razavi Province during 2011-14.

Results: The prevalence rate of hydatidosis was 1.44 per 100000 individuals. Of 357 cases, 54.9% were women, 40.3% rural, 45.8% housewives, and 3.4% were Afghan. The mean age of women was higher than that of men (39.13±18.9 compared to 34.7±17.9 yr, respectively, *P*-value=0.025). The highest proportion of cases (39.2%) was in the age group of 21-40 yr old. Abdominal pain was reported in 42.3% of cases. Liver involvement was the most common localization of hydatid cyst reported in 59.4% of patients, and 8.4% had multiple organ involvement. The common diagnosis methods of the disease were radiology (42.3%) followed by CT scan (37.8%). 45.9% of patients had domestic dog and hygiene principles of washing the vegetables was adhered by 6.7% of patients.

Conclusion: The prevalence of human hydatidosis, as a most important neglected disease, should be considered by health policy-makers in public health domain. In addition, educational programs to better recognition of the disease symptoms, and to identify the infection sources are needed in high risk group of population.

Introduction

Hydatid cyst disease is one of the most important zoonotic diseases, which occur, in larval stage of *Echinococcus granulosus* parasite. In this disease, canines such as dog, wolf, fox, and jackal (the final host) are infected by eating contaminated viscera, and small adult worms with size of 2-7 mm are formed in their intestines and begin to spawn. Canines repel the eggs of adult worms along with feces and infect the soil, water, and vegetables. Herbivores as the main intermediate host are infected by eating forage contaminated with the larvae of this parasite. Besides, human as the intermediate host is infected accidentally either by eating contaminated water and vegetables, or direct contact with contaminated dogs is infected to parasite egg of this disease; and hydatid cyst is usually involved the lung and liver in human (1, 2).

Epidemiological, clinical, and pathological symptoms of this disease depend on some factors such as age, gender, infection severity, cyst size, and the involved organ in the body (1, 2). This disease is common in most parts of the world especially in countries where animal husbandry is current. Contamination to this parasite is spreading in most tropical regions of the world and it is globally distributed in many countries such as Argentina, Peru, East Africa, Central Asia, China, and South America (3).

In endemic regions, the incidence rate of disease can be reached over 50 per 100,000 person-years with the prevalence rate of 5%-10% in human (3, 4). On the other hand, hydatidosis is among the most important human diseases with the high health and economic burden (5, 6). Iran is one of the areas that has been considered as hyper-endemic area by WHO in terms of close relationship of a high proportion of society with animals, traditional animal husbandry, and then contact with the sources of infection (7, 8). The prevalence rate of this disease in the intermediate host has reported as 11.5%-34.6% (9), and the prevalence rate of human hydatid cyst has been reported from 1.1% to 13.7% in different parts of Iran (10-12).

Assessment of the epidemiological and clinical aspects of the disease can help health policy-makers to focus on the main public health problems in the community and to assess the efficacy of control and preventive programs to limit the spread and transmission of the parasite in humans.

Hence, the present study aimed to determine the epidemiological and clinical status of human hydatidosis in Khorasan Razavi Province during 2011-14.

Materials and Methods

This cross-sectional study was conducted in Khorasan Razavi Province, the Northeast of Iran, in 2014. The study population was all cases with hydatid cyst who diagnosed in governmental and private laboratories, hospitals and health centers in Khorasan Razavi Province during 2011-14.

The data collection was performed using a checklist including age, sex, nationality, place of residence, occupation, infected organ, the number of cysts, the type of diagnosis (CT scan, MRI, radiology, sonography, Immunofluorescence, other), clinical symptom, and having risk factors such as how to wash vegetables and contact with dog.

Descriptive statistics including frequency tables and diagrams as well as analytical statistics including Chi square and T-student tests were used for data analysis. All statistical analyses were performed at 0.05 significance levels using Stata software, version 12 (Stata Corp, College Station, TX, USA). In addition, mapping the percentage of hydatid cyst cases was created using GIS software by cities. For considering ethical issues in data collection, it

should be noted that all information of the patients has been confidential and the information has been recorded with code and without mentioning name.

Results

In total, 357 hydatid cyst cases had been registered in the health centers during the periods 2011-14 in all parts of Province. The prevalence of hydatidosis was 1.44 per 100000 individuals. Fig. 1 shows the percentage of hydatid cyst cases by county. The most percentage of the cases is related to the northern cities. The most percentage of cases was related to the cities Mashhad (51.8%), Ghoochan (7.8%), Neishabour (7.0%), and Fariman (4.8%), respectively.

Demographic characteristics of studied patients by sex are shown in Table 1. Of 357 cases, 54.9% were women, 40.3% rural, 45.8% housewives, and 3.4% were Afghan. The mean age of women was higher than that of men (39.13±18.9 compared to 34.7±17.9, respectively, *P*-value=0.025). About 21% of cases were younger than 20 years old. Farmers and ranchers were included the small number of cases.

Torbatheidarieh	1
Neishaboor	2
Sabzevar	3
Bardskan	4
Kashmar	5
Joghtai	6
Jovin	7
Khoshab	8
Firoozeh	9
Ghoochan	10
Dargaz	11
Chenaran	12
Torghabeh shandiz	13
Mashhad	14
Kalat	15
Sarakhs	16
Fariman	17
Torbatjam	18
Zaveh	19
Bakhazar	20
Taibad	21
Khavaf	22
Mahvelat	23
Rashtkhar	24
Gonabad	25
Bajestan	26
Khalilabad	27

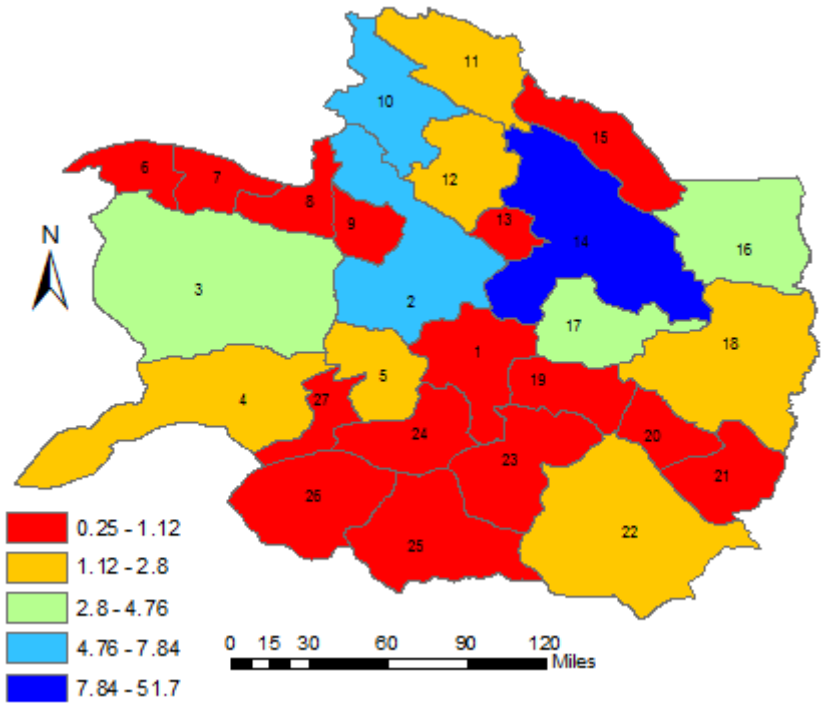

Fig. 1: Percentage of hydatid cyst cases by county in Khorasan Razavi Province in 2011-14

Table 1: Demographic characteristics of patients with hydatid cyst by sex in Khorasan Razavi Province in 2011-14

Variable	Subgroup	Male (n=161)	Female (n=196)	*P*-value [a]
Location	Urban	87(54.0)	126(64.3)	0.050
	Rural	74(46.0)	70(35.7)	
Age group	0-20	35(21.7)	40(20.4)	0.209
	21-40	69(42.8)	71(36.2)	
	41-60	41(25.5)	51(26.0)	
	>61	16(10.0)	34(17.4)	
	Continuous [b]	34.7±17.9	39.1±18.9	0.025
Job	Employed2	2(1.2)	4(2.1)	0.001
	Farmer3	26(16.2)	3(1.5)	
	Housekeeper4	7(4.4)	156(80.0)	
	Rancher6	12(7.4)	0(0.0)	
	Student7	22(13.7)	21(10.8)	
	Other5	92(57.1)	11(5.6)	

*Data are presented as number (%). [a]Statistical analysis was done using Chi-square. [b] Comparing mean age was done using *t*-test.

The most common symptom of cases was related to the cities Mashhad (51.8%), Ghoochan (7.8%), Neishabour (7.0%), and Fariman (4.8%), respectively. Moreover, 45.9% of patients had domestic dog and hygiene principles of washing the vegetables was adhered by 6.7% of patients and 64.4% were washed the vegetables with water alone (Table 2).

The majority of patients (70.5%) were infected with a single cyst, and 24.5% of them had multiple cysts. One hundred fifty one (42.3%) of patients were diagnosed by radiology method and 37.8% by CT scan method. The most common clinical symptom in the hydatidosis patients was abdominal pain (42.3%), after that hepatomegaly (27.4%), chest pain (21.6%), and cough (8.7%) were other common symptoms. Liver involvement was reported in 59.4% of patients, and 8.4% had multiple organ involvement (Fig. 2).

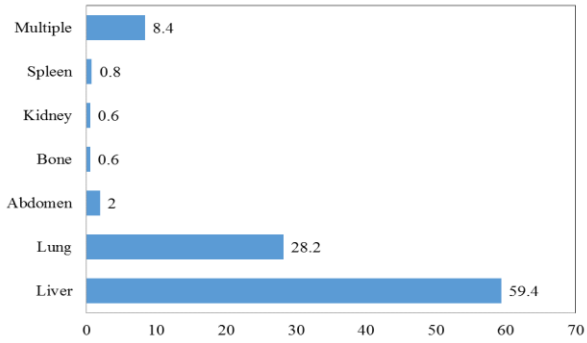

Fig. 2: Status of organ involvement in the patients with hydatid cysts in Khorasan Razavi province during 2011-14

Table 2: Risk factors of hydatid cysts in the patients in Khorasan Razavi Province in 2011-14

Variable	Subgroup	Number	Percent
Contact with dog	Yes	164	45.9
	No	193	54.1
Consumption type of vegetables	Washing with water alone	230	64.4
	Washing with water and detergent	87	24.4
	Washing with water and disinfectants	16	4.5
	All three methods	24	6.7

Discussion

The prevalence of human hydatidosis was 1.44 per 100,000 individuals in Khorasan Razavi Province. Previous studies conducted from different parts of Iran found the annual incidence of 1.33 in Hamadan (13), and 0.54 in Kermanshah (14) per 100,000 population. In addition, the rate of infection varied from 1.79% in Ardabil (11) to 13.8% in Khozestan (12).

Our findings showed that the highest proportion of hydatidosis (39.2%) in the age group of 21-40 years old. According to some factors such as geographical region, culture, and workforce; age can play an important role on the occurrence of the infection. In this regard, previous studies have reported the highest proportion of hydatidosis in the different age groups. For example, the age group of 60-69 in Isfahan (10), 40-49 year in Ardabil (11), and 30-60 year in Qom (15). Based on a review study, the range of 20-40 years old as the age group of the highest proportion has been reported (7).

The findings of this study showed the most percentage of infection in women than men (54.9% compared with 45.1%, respectively). This might be due to more contribution of women to agricultural and animal husbandry in this region. The high frequency of the disease in women than men is consistent with the obtained results of other Iranian studies (16, 17) and other countries (18, 19). However, some studies reported the higher rate of infection in men (10, 11, 15). Moreover, as stated in the previous studies conducted in Iran (7, 20), the housewives had the highest proportion of infection. It may be due to the more likely to contact with the source of contamination especially vegetables contaminated to parasitic eggs.

In our study, the highest proportion of hydatidosis was urbanite. There are some reasons for this finding. For example, the most percentage of the province's population is urbanite and another might be a good-quality disease reporting. There are conflicting results in this regard; some studies reported the same result with our study (11, 15, 20, 21), and other reported inconsistent result (8, 22).

We found that abdominal pain was the main symptom with a proportion of 42.3% in the patients. Studies conducted in Turkey (23) and Iran (24) has reported a proportion of 77.6% and 66% for this symptom, respectively. In our study in line with previous reports (24, 25), liver was the most common localization of hydatid cyst. About 8.4% of the patients in this study had multiple organs involved and it was 12.3% in another study in Iran (24).

The common diagnosis methods of the disease were radiology (42.3%) followed by CT scan (37.8%). In a study to determine the pattern of hydatid cyst during 2000-10 in Tehran revealed that ultrasonography and CT scan were the most used imaging methods (24). Our findings demonstrate that these methods are the available tools for detecting hydatid cyst in Iran.

Concerning risk factors of infection with hydatidosis, our results found that 45.9% of individuals were in contact with dog, 64.4% of them have washed the vegetables with the water alone and 6.7% have washed the vegetables by hygiene principles of washing. Consequently, focus of improvement in education level of the society could be better. In Bulgaria (25) 90% of the affected children had sustained contact with dogs.

Conclusion

The prevalence of human hydatidosis, as a most important neglected disease, should be considered by health policy-makers in public health domain. In addition, educational programs to better recognition of the disease symptoms, and to identify the infection sources are needed in high risk group of population.

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