Epidemiological Characteristics of Patients With Hydatid Cysts in Qom Province Hospitals From 2001 to 2019

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Background: Cystic echinococcosis (CE), caused by the larval stage of the Echinococcus granulosus, is a common human and animal disease that occurs worldwide. This study aimed to investigate the clinic-epidemiological characteristics of patients with hydatid cyst in surgical cases from 2001 to 2019 in Qom hospitals.

Methods: This cross-sectional study was conducted in Qom province, the center of Iran, from 2001 to 2019. The study population included all cases with hydatid cyst who operated in governmental and private hospitals. The participants’ characteristics such as age, gender, occupation, place of residence, organ involved, clinical signs and, diagnosis and treatment methods were collected using a questionnaire. The statistical analysis was carried out using SPSS (version 23) software package.

Results: The results revealed that 53.21% and 46.79% of patients were females and males, respectively. Most cases were urban residents (57.69%), and 62.18% of them were housewives. Liver involvement was the most common localization of hydatid cysts reported in 73.7% of patients. The main diagnostic procedures were computed tomography scanning and indirect hemagglutination (IHA). Abdominal pain was reported in 62.2% of cases, and the most common treatment method for the disease was surgical (84.6%). Further, recurrence occurred in 13.47% of patients.

Conclusions: The results of this study showed that the majority of patients with CE were housewives. Therefore, proper washing of fruits and vegetables is very important. To prevent the occurrence of CE, the public awareness level should be increased. In addition, educational programs must be conducted by the Ministry of Health to identify whether the control measures are needed in the high risk population.

Keywords: Humans, Echinococcosis, Epidemiology, Zoonosis, Iran

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surrounding villages have increased the prevalence of this disease among urban and rural residents (10).

Epidemiological studies help health policymakers adopt appropriate prevention programs. Considering that limited studies have been conducted in Qom province in this regard, the present study aimed to determine the epidemiological status of surgical patients with hydatid cyst admitted to hospitals in Qom province from 2001 to 2019.

Materials and Methods

Study Area
The study was conducted in Qom, in the center of Iran. Qom is located 140 km (87 mi) to the south of Tehran. It has a hot summer semi-desert climate.

Samples and Data Collection
This cross-sectional descriptive epidemiological study investigated the records of 156 patients with surgical hydatid cyst in governmental and private hospitals in Qom province. The participants consisted of all patients who underwent hydatid cyst surgery at the beginning of 2001 to the end of 2019. After approving the project and obtaining the ethical code (IR.MUQ.REC.1397.172) from the research committee of Qom University of Medical Sciences, the necessary coordination was made with the hospital and the treatment staff to provide access to patients’ hospital records.

A questionnaire was used to collect the data, and information about participants’ characteristics such as age, gender, place of residence, occupation, organ involved, recurrence of disease, clinical signs, and diagnosis and treatment methods were recorded in the patient information registration form. After collecting the data and extracting them from the questionnaires, the information was recorded and then statistically analyzed.

Statistical Analysis
The statistical analysis was carried out using SPSS (version 23) software package. Absolute or percentages were used to describe categorical variables. For quantitative variables, depending on the distribution, results were expressed as mean ± standard deviations. A P value less than 0.05 was considered as statistically significant.

Results
From 2001 to 2019, 156 patients including 73 (46.79%) males and 83 (53.21%) females in Qom province were recorded for hydatid cyst surgery. According to Table 1, the majority of patients were within the age range of 26-35 years (n = 41), while the age range fewer than 15 years had the lowest frequency (4.48%). Among the participants in terms of occupation, housewives had the highest frequency (51.28%, n = 80).

Government employees and ranchers constituted a small number of cases. In terms of residence, 57.69% (n=90) of patients were urban and 42.31% (n=66) were rural residents, and urban residents were more infected than rural residents (Table 1).

Right liver involvement was reported in 47.43% (n=74) of patients, and 2.57% (n=4) were reported to have simultaneous liver and lung involvement. Furthermore, 75 (48.1%, n = 75) patients were diagnosed by CT scan method and 86.54% (n = 135) by the indirect hemagglutination (IHA) method (Table 2).

As indicated in Figure 1 and Table 3, the most common clinical symptoms in hydatidosis patients were abdominal pain (60.25%, n = 94) and nausea (39.75%, n = 62).

Table 1. Frequency of Patients With Hydatid Cyst

| Variables             | Sub-group | Hydatid Cyst Frequency |
|-----------------------|-----------|------------------------|
|                       | No.       | %                      |
| Gender                |           |                        |
| Male                  | 74        | 47.44                  |
| Female                | 82        | 52.56                  |
| Age group (y)         |           |                        |
| Up to 15              | 7         | 4.48                   |
| 16-25                 | 24        | 15.38                  |
| 26-35                 | 41        | 26.28                  |
| 36-45                 | 33        | 21.15                  |
| 46-55                 | 31        | 19.87                  |
| Over 56               | 20        | 12.82                  |
| Abundance job         |           |                        |
| Housewife             | 80        | 51.3                   |
| Freelance             | 31        | 19.87                  |
| Government job        | 3         | 1.92                   |
| Shepherd              | 9         | 5.76                   |
| Farmer                | 7         | 4.48                   |
| Others                | 26        | 16.66                  |
| Place of residence    |           |                        |
| Urban                 | 90        | 57.69                  |
| Rural                 | 66        | 42.31                  |
| Total                 | 156       | 100                    |

Table 2. Frequency of Patients With Hydatid Cyst Based on the Involved Organ and Diagnosis Method

| Variables             | Sub-group | Hydatid Cyst Frequency |
|-----------------------|-----------|------------------------|
|                       | No.       | %                      |
| Involvement organ     |           |                        |
| Right liver           | 74        | 47.43                  |
| Left liver            | 28        | 17.9                   |
| Right lung            | 33        | 21.15                  |
| Left lung             | 12        | 7.69                   |
| Liver and lung        | 4         | 2.57                   |
| Other organs          | 5         | 3.2                    |
| Total                 | 156       | 100                    |
| Diagnosis method      |           |                        |
| Sonography            | 42        | 26.92                  |
| CT scan               | 75        | 48.1                   |
| MRI                   | 1         | 0.64                   |
| Sonography and CT scan| 33        | 21.15                  |
| Sonography and MRI    | 2         | 1.28                   |
| CTS and MRI           | 1         | 0.64                   |
| Sono, CT scan, and MRI| 2         | 1.27                   |
| Total                 | 156       | 100                    |
| Serological diagnosis |           |                        |
| IHA                   | 135       | 86.54                  |
| ELISA                 | 21        | 13.46                  |
| Total                 | 156       | 100                    |

Note: CT: Computed tomography; MRI: Magnetic resonance imaging; IHA: indirect hemagglutination; ELISA: Enzyme-linked immunosorbent assay.
Table 3. Frequency of Patients With Hydatid Cysts Evaluated by Clinical Symptoms

| Clinical Sign          | No  | Yes   | %    |
|------------------------|-----|-------|------|
| Abdominal pain         | 62  | 94    | 39.75|
| Dyspnea                | 119 | 37    | 76.3 |
| Salty sputum           | 133 | 23    | 85.26|
| Hemoptysis             | 134 | 22    | 85.9 |
| Chest pain             | 122 | 34    | 78.3 |
| Cough                  | 116 | 40    | 74.35|
| Nausea                 | 94  | 62    | 60.25|
| Vomiting               | 117 | 39    | 75.0 |
| Decreased appetite     | 101 | 55    | 64.74|
| Weight loss            | 121 | 35    | 77.57|
| Fever chills           | 101 | 55    | 64.74|
| Headache               | 128 | 28    | 82.1 |
| Eosinophilia           | 97  | 59    | 62.17|

The alkaline phosphatase liver enzyme levels raised in 25% (n = 39) of patients, and 77.56% (n = 121) of patients underwent both chemical treatment and surgery at the same time. Regarding how albendazole was administered, 55.13% (n = 86) of patients took albendazole continuously. The majority of patients (75.65%, n = 118) were infected with a single cyst, and 4.48% (n = 7) of them had more than 4 cysts, while 13.47% (n = 21) of patients had a recurrence.

Discussion

Hydatid cyst is a common parasitic infection in humans and animals that occurs worldwide and causes basic public health problems and economic damage. This disease is endemic in Iran, and human cases have been reported in almost all provinces across the country (11). The present study aimed to determine the epidemiological status of surgical patients with hydatid cyst admitted to hospitals in Qom province from 2001 to 2019.

Our findings showed that out of 156 patients, 82 (52.56%) were females and 74 (47.44%) were males. The findings of the current study indicated this infection was more frequent in women compared to men. This might be due to the greater contribution of women to agricultural and animal husbandry in this region. This result is consistent with the obtained results of other Iranian studies (12-14) and other countries (15,16). Similar to other studies in Zanjjan (17), Isfahan (18), Jordan (19), and Yasuj (20), most patients were in the age range of 26-35 years. It seems to be due to the prevalence of infection in young people which eventually becomes symptomatic at the age of 26 to 35 years owing to the limited and slow growth of the cyst.

The results obtained from this study showed that housewives had the highest proportion of infection (51.28%, n = 80), which is similar to the results of other studies (21,22). It seems that women, especially housewives, are more exposed to the disease due to their main role in preparing and cooking family food, and they are more likely to encounter vegetables and fruits contaminated with parasitic eggs than men.

In a study on surgical cases of hydatid cyst in Ahvaz hospitals during 2004-2014, the highest prevalence of the hydatid cyst was in the right lobe of the liver (26.1%). This is consistent with the results of the present study. Among the imaging methods in Ahvaz, sonography and magnetic reasoning imaging had the highest and lowest use in the diagnosis of the disease, respectively, but in our study, CT scan had the highest percentage (23).

Similar to the current study, most studies conducted...
on the prevalence of the hydatid cyst identified the liver as the most involved organ (2,24-27) with a 57.5%, 68%, 74.3%, 77%, and 43% frequency, respectively. Only two studies carried out in the North West of Iran and Bulgaria indicated that lung was affected more than the other organs (28,29), although these studies were conducted among children.

Moreover, the results of this study indicated that the incidence of the disease in Qom during the mentioned period is significant. Further, more comprehensive and up-to-date studies are need to educate and inform the public about this disease and to control and interrupt the parasite cycle. Abandoned and stray dogs seem to play an important role in establishing the parasite cycle; accordingly, a solution must be found to control them.

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Conflict of Interests
The authors declare no conflict of interests.

Ethical Approval
This study was approved by the research committee of Qom University of Medical Sciences (IR.MUQ.REC.1397.172).

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