



## Prevalence of Human Cystic Echinococcosis: A Clinico-epidemiological Study in Northeast of Libya

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### Abstract

Cystic echinococcosis (CE) or hydatid cyst is the most important zoonotic disease that causes significant economic losses and public health problems worldwide. It is an endemic disease in the Mediterranean area that has not yet been fully documented in eastern Libya. This study was conducted to evaluate retrospectively 79 patients diagnosed with the CE disease at three hospitals in Benghazi and the main hospital in El-Beyda. Medical records were surveyed of infected patients with CE who had been operating in four hospitals from 2000 till end of 2002. Several parameters were studied, including age, sex, place of habitation, and the location of cysts. Of the 79 cases, 60.2% (n=48), 39.8% (n=31) were female and male respectively, with the mean age of 46 years (1– 90). The most affected age group was 1-10 years old (30.4% of the cases). A Single organ involvement was seen in the majority of patients. The cysts were most frequently found in the liver (55.7%), followed by the lungs (22.8%), then other organs (16.4%). Among patients, 5.1% had cysts in 2 organs (lungs and liver). The distribution of residence of patients showed that 44 (55.7%) of them were Benghazi residents, followed by El-Beyda residents by 12 (15.2%). Conclusion: The population in northeast of Libya is suspected to be at high risk for CE infection because many inhabitants have flocks of sheep or goats that are kept around dogs for protection.

**Key words:** Cystic Echinococcosis (CE), Medical records, epidemiological, Libya

### Introduction

Cystic echinococcosis (CE), a generally chronic endemic helminthic disease, is one of the most extensive helminth zoonotic diseases in human caused by infection with the larval stage of the tap worm, *Echinococcus granulosus*<sup>[1]</sup>. The life cycle of this parasite requires two mammalian hosts. The adult worm, which lives in the small intestine of dogs (definitive hosts), lays eggs expelled with the faeces of the infected animal, contaminating the surroundings. Humans can become infected by ingesting eggs that contaminate food or water, or from contact with infected dog faeces; the

consequence of a human infection is the growth of cysts in the liver, lungs, or other organs<sup>[1and2]</sup>. Infection with *E. granulosus* results in the development of one or several unilocular hydatid cysts that in humans develop mainly in the liver (70%), but also lungs (20%); and 10% of cysts can occur almost somewhere in the body<sup>[3]</sup>. High parasite prevalence is particularly widespread in the Middle East and in Arab North Africa<sup>[4 and 5]</sup>.

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In Libya, CE is a serious public health and livestock-related economic problem, with an incidence of more than 1 per 100,000 individuals within the Libyan population [6]. Whereas *E. granulosus* is the only species of the genus *Echinococcus* found in Libya [2 and 7]. Libyan people keep guard dogs, but there is little direct human: dog contact. Many people own a single dog, invariably kept outside and often chained up. Stray dogs are common, roaming the countryside to scavenge sheep carcasses etc., and such dogs could be the main reservoir of *E. granulosus* in Libya. Because of the minimal direct human: dog contact, transmission of hydatid disease in Libya is probably indirectly by ingestion of eggs from contaminated vegetables or drinking water [8]. Hydatid cyst is diagnosed by physical examination and radiological evaluation, and symptoms are related to size, location, rupture and infectivity of cysts. Therefore, data inferred from the hospital records are still considered the most dependable source of information on human hydatidosis. The aim of this study was to compile data from the hospital records of CE patients in four hospitals in the Northeast of Libya as an attempt to characterize aspects of the disease. **Material and Methods**

### Material and Methods

This prospective study included 79 cases of CE that were diagnosed and treated surgically at three Hospitals in the Benghazi city (Al-Jallah Trauma Hospital, 7th October Hospital and Children Hospital) and main hospital in El-Beida city between January 2000 and December 2002. Patients from different parts in the Northeast of Libya of were referred to these hospitals for surgery. All cases of surgically confirmed CE initially diagnosed by clinical and imaging (X-ray, ultrasound, and/or computerized tomography) findings. Questionnaire and full clinical examination that included history and physical findings, with special emphasis on geographic location, association with dogs or sheep, age at the time of surgery, gender, occupation, number of cysts and the anatomic location of cysts were recorded. The collected data were statistically analysed.

### Results and Discussion

The total number of CE surgeries recorded was 79 cases in the Northeast of Libya at four hospitals

that including in this study. In terms of geographical distribution, patients who treated surgically for CE were residents from different regions in the Northeast of Libya from Benghazi or surrounding area till Tubreq (Figure 1 and Table 1). The highest rate was found in Benghazi (55.7%), followed by El-Beyda and Al-Guba with 15.2% and 12.7% respectively. Of the 79 cases, 60.2% (n=48), 39.8% (n=31) were female and male respectively. Age distribution relating to 79 established cases of human CE by age groups was shown in (Table 2). Age of the patient varied between less than 10 years to above 80 years. The youngest patient operated was 1 years and the oldest was 90 years old, the highest surgical prevalence of the disease was found in the age group (1-10) years with 30.4% of the total number of cases. Cyst distribution in various anatomical sites is shown in (Table 3). Cysts were found most frequently in the liver (14/30 cases, 55.7%), followed by the lungs (12/6 cases, 22.8%). Four patients possessed cysts couple of organs. All of them had cyst(s) in the liver, with an additional cyst either in the lung. Females had more hepatic cysts than males. Single organ cases were more common in females than in males. An equal number of multiple organ infections were recorded in both genders. 16.4% of total case was recorded in other organs.



Figure1: Map of Northeast of Libya shows location of different regions of our study [9]

**Table 1: Demographic distribution of patients among different regions**

Name of City	Total No	%	Female	%	male	%
Benghazi	41	55.7	29	65.9	15	34.1
Al-Marj	5	6.3	3	60	2	40
El-Beida	12	15.2	4	33.3	8	66.7
Sahat	0	0	0	0	0	0
Al-Guba	10	12.7	7	70	3	30
Darna	3	3.87	2	66.7	1	33.3
Tubruq	5	6.3	3	60	2	40
Total	79	100	48	60.8	31	39.2

**Table 2: Age distribution of surgically confirmed CE cases at four hospitals**

Ages	Number of Cases	%
1-10	24	30.4
11-20	15	18.9
21-30	8	10.1
31-40	11	13.9
41-50	7	8.9
51-60	4	5.1
61-70	6	7.6
71-80	2	2.5
81-90	2	2.5
total	79	

**Table 3: Location of Hydatid cyst with single and multiple organ involvement**

Organ	Total No	%	male	%	Female	%
Liver	44	55.7	14	31.8	30	68.2
Lung	18	22.8	12	66.7	6	33.8
Liver+ lung	4	5.1	2	50	2	50
Other organs	13	16.4	3	23.7	10	76.9
Total	79		31	39.2	48	60.8

Cystic echinococcosis is a zoonotic infection that occurs worldwide. Hydatid cysts are one of the major parasitic infections in Libya that causes many health problems to human [10]. In this study, the infection rates in different cities (Benghazi, El-Beida, Al-Guba, Al-Marj, Tubruq and Darna) were (55.7%, 15.2%, 12.7%, 6.3% and 3.8%) respectively. This result may refer to the high number of populations in Benghazi comparison to

other cities, moreover, this finding similar to the study, which reported CE is prevalent in all domestic animals with variable rates of infection between the animal species and between the areas of Libya [11]. Our study presented 79 patients surgically treated for CE at four hospitals, 60.2% and 39.8% of them were female and male respectively. In line with other studies conducted that women had more hydatid surgeries than men in different studies [12], these studies were carried out in Iran [13], Turkey [14], Portugal [15], Jordan [16], Iraq [17] and Libya [18and19]. The reason for this is not clear, but genetic differences between two genders or life style behave [13and20]. In our finding, the age of the cases ranged from 1 to 90 years in both males and females. A surprise result of our study, the ratio of infection was found high in children between (1-10) years (30%), Although illness usually occurs approximately 5–10 years after infection, CE may present in individuals younger than 1 year of age and older than 75 years [21], this finding is consistent with our results. The explanation for that is not clear, and this may be refer to direct/indirect contact with infection dog with children between 5-10 years. Moreover, our study on cyst locations revealed that different organs were involved with CE. CE was detected more frequently in the liver (68.2%) than in the lungs (5.1%), a finding consistent with another study [22] reporting that cystic larvae develop mainly in the liver and pulmonary regions. This may be attributable to the fact that the liver and lungs are responsible for the primary filtration of blood comparison with other organs. Our results were based on medical registers in local hospitals, according to the available data from different hospitals and in the absence of statistically sound epidemiologic records, retrospective analysis of CE in this area. However, this may prove useful and provides a suitable indication of infection expressed an annual rate of hospital cases. Further studies are required to determine the prevalence, economic impact and risk factors of this disease in northeast of Libya.

**Conclusion**

The results of the simple present study were highlighted prevalence of human CE in northeast of Libya in comparison with reports from other studies. Furthermore, successful programs need to be applied for controlling and reducing this

disease. As a result the disease history was described along the last few decades in Libya and suggested that, the disease is continuing to spread throughout the country without any sign of the control programme.

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