



## Ultrasound Study of Hydatid Cysts in Various Age Groups and Gender; A Public Health Problem - Libyan Profile

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### دراسة الأكياس المائية باستعمال الموجات فوق الصوتية على مرضى من الجنسين وبمختلف الأعمار: مشكلة صحية في المجتمع - الصورة الليبية

#### الخلاصة:

الأكياس المائية مشكلة صحية في ليبيا وهذه الدراسة البحثية وصف لهذه المشكلة في منطقة زليتن كجزء من الصورة الصحية الليبية. تمت الدراسة على الحالات التي أحيلت لقسم الأشعة التشخيصية بمستشفى زليتن التعليمي لإجراء الفحص بجهاز الموجات فوق الصوتية وتم تصوير وفحص 1065 مريضا خلال مدة طولها 12 شهرا من يناير 2017 الى يناير 2018. وتشمل الدراسة الجنسين من الذكور والإناث من مختلف المجموعات العمرية.

كانت نتائج هذه الدراسة: من بين 1065 مريضا تم تصويرهم وتشخيصهم 504 (47%) من الذكور و 561 (53%) من الإناث ومن اجمالي المرضى الذين تم تصويرهم 7 (0.66%) حالات تبين أنها مصابة بمرض الأكياس المائية وهذه النسبة تتوافق مع ما جاء في الدراسات السابقة في ليبيا والمناطق الموبوءة الأخرى في العالم.

من الدراسة البحثية تبين أن أعلى إصابة بالمرض بين متوسطي الأعمار وأنها بين الإناث أكثر من الذكور تأكيدا لما جاء في الأبحاث التي أجريت سابقا. تناول البحث مراجعة للعوامل المسببة

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ومن بينها غياب السلطات المختصة في مكافحة المرض. كما تناول البحث الوسائل العلمية لتفادي المرض والقضاء عليه.

**ABSTRACT:**

*Purpose of study:* hydatid disease is a serious problem in Libya. The aim of this study was to describe this problem in Zliten city as a part of Libyan profile. *Materials and method:* this study conducted on referred 1065 patients to radiology department in the hospital for ultrasound examination, including various age groups during the period of 12 months, from January 2017 to January 2018. *Result:* total examined patients were 1065; males were 504 (47%) and females were 561 (53%) patients. From 1065 examined patients found 7 patients were affected with hydatid disease. *Conclusion:* hydatid disease in Libya is a public health problem. We described the problem by use of ultrasound examination for referred patients to the hospital. We found 7(0.66%) patients got infection with hydatid cysts from 1065 examined patients. The highest rate of infection was in the middle age group and higher in females than males similar to the literature studies.

**KEY WORDS:** Hydatid cysts, Ultrasound, Libyan patients, Age, Gender.

**INTRODUCTION:**

Echinococcosis or hydatid disease is a zoonotic infection due to larvae of the tapeworm echinococcus (E.). The most important species for human are E. granulosus causes (cystic echinococcosis) and E. multilocularis causes (alveolar echinococcosis). Less common types are E. vogeli causes polycystic echinococcosis and E. oligarthrus causes (unicystic echinococcosis). Hydatid disease is worldwide distributed and spread in most areas of the world. Currently affected one million people by the disease, and caused death of thousands of patients in the world, as well as was lost a high economic cost. The ingested contaminated food

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and water with eggs of the parasite or contact with infected animals cause quick spread of the disease.<sup>1</sup>

Libya locates in middle of North Africa that affected area with hydatid disease. The total Libyan population was 6.6 million according to a 2006 census. Most of Libyan population is in the main cities and coast of northern Libya.<sup>2</sup>

**RISK FACTORS OF HYDATID DISEASE INFECTION IN LIBYA:**

- \* Geographical location of Libya and availability of hosts making the environment contaminated with the parasite.
- \* The exposed human by cystic echinococcosis connecting to occupation especially farmers, veterinarians and butchers or during livestock breeding or exposure during hunting as well as ingestion of contaminated food or contaminated drinking with parasite eggs.
- \* The high incidence of hydatid disease in Libya most likely due to home slaughter and there were no abattoirs governmental inspectors. In Libya, there is a high population of sheep, goats and camels that are the intermediate host with dogs and are definite host. These animals live on the contaminated graze and gets infection with eggs of the hydatid disease tapeworm.
- \* Slaughtering of animals for production meat without veterinarians supervision is common in Libya (in last three decades). Usual slaughtering is in corners of butcher shops without government inspection.
- \* Human behavior in Libya is increasing risk of infection to livestock due to feeding of raw viscera and scavenging dead animals to dogs in festivals of marriage days that maintains highly infected farm and stray-dogs. Dog feeding of infected offal is the most commonly risk factors for canine infection with *E. granulosus*.
- \* The stray-dogs roam anywhere in Libyan country even in the cities and villages (Picture 1,2).

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- \* Lack of anti-helminthic treatment for infected dogs (treatment and vaccination programme for animals is the responsibility of Libyan government). This may explore aggressive public health problem in future.
- \* Lack of general people knowledge. Individual families kept dogs for guarding, herding, hunting or companionship and these dogs pass their feces at the vegetables and fruits in the farms that sent to the public markets.<sup>2-8</sup>
- \* The serious economic and political changes with government collapse followed by retardation of health services and country destruction may lead to more serious health problems nearby.



Picture 1: A stray-dog defecates on the graze of a square in one city in Libya (early morning). This place is a children's play area at evening time

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Picture 2; Stray-dogs stayed near to a house in village

**HISTORY;**

The recognized affected humans by hydatid disease were since 2000 years. Recognition of the disease was by the ancient scholars; Hippocrates, Aretaeus, Galen and Rhazes.

In Libya, Medulla in 1931 reported the echinococcosis granulosis in livestock and stated that the cystic echinococcosis is common in camels. Cicogna in 1961; studied the prevalence of hydatid disease in sheep and cattle in western Libya and reported that the examined animals were respectively infected with the disease. Later many investigators in Libya collected abattoir data and stated the rate of infection with the disease in animals.<sup>4</sup>

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Dar F.K and Taguri S, retrospectively studied hydatid disease confirmed surgically and found the incidence was 0.85% of all admitted patients in the hospital in Benghazi-Libya. The study showed no significant difference in infection between males and females, but the susceptibility difference in age groups was widely suggested. The major number of hydatid cysts in adults was highly affected the liver followed by lung, whereas in children, the major number of infection was in the lungs followed by the liver, as well as the infection was very rare in other parts of the human body.

Ashour, et al in 1978 studied calcified abdominal masses that appeared on x-ray as multiple opacities in abdominal field (Figure 1). These calcified masses believed to be calcified hydatid cysts when reported in the first time in Libya.<sup>9</sup> In the same time Gamil F.A, in Benghazi-Libya reported number of cases of hydatid cysts presented with acute abdomen.<sup>10-12</sup> One study in Libya during period of (1972-1979) 22,979 hospitalized patients and among these patients 111 (0.5%) were infected with hydatid cysts.

Chyczewski L, et al in 1983, admitted patients in surgical department-Zliten Teaching Hospital in Zliten city found abdominal calcified masses shown on X-ray which were similar findings reported by Ashour et al in Benghazi-Libya. They removed these calcified masses from the patients and they described morphologically and microscopically structures of these masses in details proving calcified death hydatid cysts. This pattern of calcification is most likely due to long time of hydatid disease infection.<sup>13,14</sup>

In last years many studies of hydatid cysts was underwent in Libya including study by Shambesh M.A et al during (1994-1995) ultrasound survey 20,220 people >1 month old. 339 (1.7%) screened patients have abdominal hydatid disease.<sup>15</sup>

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Figure I: X-ray showed multiple calcified masses in the abdominal field

**MATERIALS AND METHOD:**

From January 2017 to January 2018 more than 1000 patients referred to our department in Zliten hospital for ultrasound examination. Male patients were 504 and female patients were 561. The ages of patients were between 3 months and 95 years old. Analysis of the studied data correlated with age and gender. Ultrasound used (Philip – ClearVue 350) with curved transducer of frequency 3.5 MHz and 7.5 MHz for examination of the superficial parts.

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**RESULTS:**

Ultrasound study performed for referred 1065 patients. They include 504 (47%) male patients and 561 (53%) female patients. Patients aged between 3 months and 80 years. The youngest affected patient aged 10 years. From 1065 examined patients, there were 7 (0.66%) affected patients with hydatid cysts. The cysts had characterized ultrasonic features of the hydatid disease.

Age groups (years)

	5 – 20	21 – 35	36 – 50	> 50
No. of cases	1	1	4	1
% of cases	14.28%	14.28 %	57.16%	14.28%

Table 1: Age distribution of affected patients with hydatid cysts

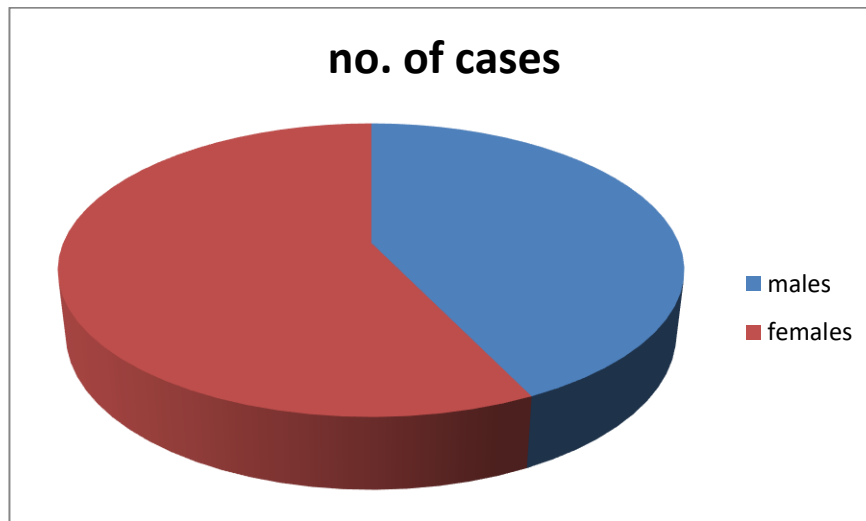
Most of hydatid disease infection affected the middle age (group 36 – 50 years) and the lowest infection with hydatid disease affected the children, young adults and the old people (more than 50 years) table 1.

Hydatid disease affected the females more than males; female patients with hydatid disease were 4 (57%) and male patients were 3 (43%) only (Figure 1).



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Graph I: Sex distribution of the affected patients with hydatid disease

These results were not different from results of the previous studies in Libya and other endemic countries.

**DISCUSSION:**

The hydatid disease is endemic to hyper-endemic in Libya since long time-period. In northeast of Libya was about 0.85 % of admitted patients in the hospitals during (1972 - 1979) were affected by hydatid cysts. In northwest of Libya was about 0.5% of all admission during (1971–1976) were affected by hydatid disease.<sup>3,10,15</sup> In this study which was conducted on 1065 examined patients using ultrasound during 12 months (between January 2017 and January 2018). Ultrasound described the characteristic hydatid cyst features in detail. CT scan supporting the diagnosis (Figure II,III).

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Figure II: Ultrasound abdomen showed Crumpled membrane inside the cyst in liver

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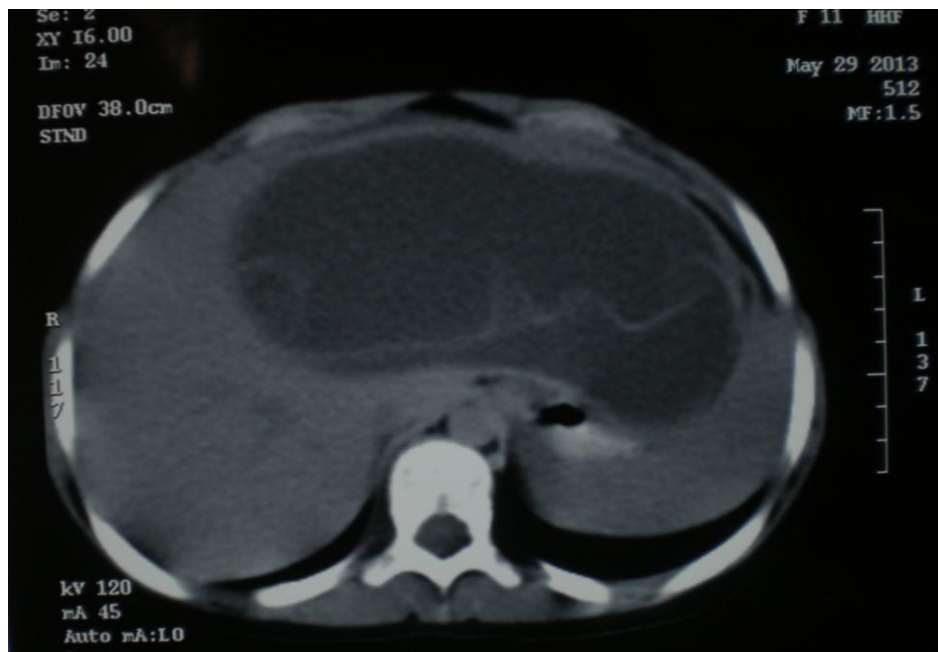


Figure III: CT scan supporting diagnosis of hydatid cyst in the liver

The results of our study were not different from the previous other studies of hydatid disease in Libya using ultrasound screening for patients in northeast and northwest of the country. Among 1065 examined patients 7 (0.66%) were affected with hydatid cysts (table 1).<sup>3,15</sup>

This important public health problem in Libya presented during long time, it thought to become more serious in future due to presence of multifactorial risks.

**PUBLIC HEALTH PROBLEM IN LIBYA:**

Unfortunately, complete absence of control programs in Libya for hydatid disease in last decades although many factors indicating to advancing the problem;

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Stray-dogs make round in farms of vegetables and fruits with absence of any sign of attempt to prevent these plants from contamination that handled to the markets in various Libyan cities. The end-result is the people infection with the disease via the contaminated foods.

Stray-dogs and cats live within the large cities and eat any disposable things including infected offal and carcasses foods. Government attempt in this environmental condition is absent.

In the previous studies in Libyan north, the rate of the disease infection in human being recorded and ranged 0.5-0.85%. In another study of ultrasound-serologic hydatid disease survey in northwest of Libya showed a prevalence rate of 1.4% (Shambesh et al 1999). Many researchers reported more than 50% of some species of livestock are infected with hydatid disease and high rate of infection in dogs need urgent control program.<sup>7,15</sup>

**CONTROL AND PREVENTION OF THE DISEASE;**

- \* Health education program is necessary (radio, television, newspapers). Importance of teaching children and students in schools and universities to prevent infection by wash the hands with water and soap before handling food.
- \* Good hygiene must be taken and precaution regarding food (vegetables, fruits and others) safety. Do not consume any suspected food or any drink to be contaminated by feces of dogs.
- \* Echinococcosis controlling by preventing transmission of the disease and control areas of the stray-dogs that disseminate echinococcus eggs with preventing the animals from consuming the infected meat.
- \* Control dogs feces by prevent dogs from roaming or soiling the immediate environment.
- \* Prevent the grazing animals from hydatid disease infection by vaccination reducing the prevalence of infection in human.
- \* Restrict home and shop slaughter of livestock.
- \* Keep dogs away from source of food in farms and homes.

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- \* In abattoir, the veterinarian supervision on slaughter is very important.
- \* Control program for both human and animal by using laboratory and imaging newly developed tools.
- \* In high population of contacted people with hydatid disease eggs such as children who play with infected dogs the serological tests may be helpful in detect cysts in early stages.
- \* Disposable the infected sheep carcasses and offal immediately and correctly, as well as prevention of dogs from getting slaughterhouse.<sup>1,5</sup>

**CONCLUSION:**

Hydatid disease is an important health problem in Libya and needs further study. During the period from January 2017 to January 2018 were referred 1065 patients to the hospital for abdominal ultrasound. Among this number of the examined patients were about 0.66 % had get infection with hydatid disease. The studied cases treated surgically in the hospital or planned for treatment. Accurate information about the hydatid disease with investigations of the intermediate and definite hosts is the role and bases of control as well as prevention of the disease.

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