

Incidence of Human Hydatid Disease in Iraq: A Review.

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Abstract: *The incidence history for hydatid disease among Iraqi population is reviewed. The distribution of the disease is mentioned in different communities. The incidence rates are also illustrated in relation to age and occupation. Hydatid disease is the most common infection in Iraq. Thus, Iraq is endemic for the disease. It is zoonotic disease and dogs, foxes and wolves are the definitive hosts where the *Echinococcus granulosus* live in the small intestine. It is a public health problem. Transmission can occur by contact with infected dogs, soil, water or unclean green vegetables contaminated with eggs of the parasite. The disease might lead to a serious pathological effects or even would interfere with normal functions of human organ. The hydatid cyst could occur in any part of the human body except the nail. The cost of chemotherapy and surgical operation is high. Therefore, implantation of a national control program is essential to apply. The control measures would include proper inspection for carcasses of slaughtered domestic animals, eradication of the stray dogs and periodical anthelmintic treatment for domestic dogs.*

Keywords: Human, Hydatid disease, Incidence, Iraq.

Introduction

Humans get infected by ingesting contaminated food or water with *Echinococcus granulosus* eggs passed from infected carnivores, or through handling pet or infected dogs (1). The stray dogs, as a definitive host, of the adult *E. granulosus*, play the most important role in the distribution of infection. In the Middle-East, hydatid disease is one of public health problems including economic losses and zoonotic behavior in many countries of the world (2). The disease in human and livestock's is caused by *E. granulosus* larval stage while the adult stage lives in the small intestine of carnivores animal as dogs, foxes and wolves which lead to contamination of the environment with its eggs. On the other hand, sheep, goats, cattle, camels, buffaloes, pigs and donkeys plays as suitable intermediate hosts, have been reported its infections with hydatid cysts in Iraq, Iran, Jordan, Lebanon, Syria, Kuwait, Saudi Arabia and sheep-raising countries as Australia and New Zealand (1,3-5). Therefore, Iraq is endemic and enzootic for the disease. The cost was measured previously in Iraq as million dollars (6).

Human loss due to morbidity and mortality is great in addition to high cost of treatment and surgical removal of the cyst and hospitalization (3,4,7). Furthermore, the economic losses occur via destruction of the infected animal viscera or carcass as well as the reduction in milk, wool and meat production. The aim of this review is to report the relevant research on hydatid disease in Iraq and so would give a better understanding about the disease.

Results and Discussion

Since Iraq is endemic and enzootic for hydatid disease in addition to the presence of high population of stray dogs, this review is conducted to elaborate the public health problem of the disease in all provinces. Incidence rates were considered according to age, sex, occupation and residency. This would give a better understanding about the situation of the disease. Consequently, this review would involve in the reduction of morbidity, mortality, cost of chemotherapy and surgical treatments. In addition, this would help in initiation and implantation of control measures for the disease in the country.

The data were collected using the Google Scholar, PubMed databases and personal communication as well. All papers were gathered and reviewed.

The incidences of hydatid disease in different populations are reviewed in different Iraqi provinces (Table 1, Figure 1). The review has been approved by the Ethical Committee of the College of Medicine, University of Basrah, Iraq.



Figure 1. Map for Iraqi provinces.

The present review revealed that the high incidence of human hydatid disease in many provinces in Iraq (Table 1). So, the disease is endemic in the country. All researchers have confirmed that the high incidence was reported among females rather among males. According to occupation, most infected women were housewives (Table 1) except Hama et al., (8) in Sulaimania have recorded animal breeders are highly affected. This is can be explained by the fact that women come into close contact with the infection sources such as infected dogs, soil, water or vegetables contaminated with the eggs of *E. granulosus*.

Regarding to the risky groups, the most frequent distribution of seropositivity was among animal breeders (7.79%), veterinarian assistant (7.3%) and veterinarian (5%), that reflects the direct contact of these groups with the animals which might carry the eggs as these eggs stick to their skin or may be due to their close contact with contaminated soil. Similar studies were conducted (9) in Kirkuk and Tikrit and indicated that the veterinarian and animal breeders were significantly at risk. A very high rate of seropositivity among butchers (57.6%) and housewives (43.58%) has proved a suggestion that they have more chances of exposure to the parasite eggs (9).

The highest incidences were reported among age group of 31-40 years among females and 41-50 among male patients (4,10). Nevertheless, Mahdi & Benyan, (11) Have recorded an incidence among age group of 3.5-18 years. Children are considered to be more exposed to infection because they play with the soil or sand and having close contact with dogs, or dog feces, and since the clinical signs of hydatid disease may take 10 to 15 years or more to develop their symptoms may not be detected until adulthood.

As observed in the present review, liver involvement was predominant in both males as well as females (4,11-13). The liver is known to be the primary filter for the invasive migrating larvae, but there is as yet no satisfactory explanation why in some instances the lung acts as a primary site of infection (14). There are 2 types, fertile and sterile cyst. They may interfere with organ functions and may reach a size of 15 Cm in diameter containing a liter of fluid. The osseous cyst lead to erode the bony structure and consequently permanent injury or fracture. The cyst is centrally fluid-filled cavity surrounded by germinative layer, laminated membrane and outer fibrous layer belong to the host. The fluid contain brood capsules and free scolices called hydatid sand.

The high incidence of human hydatid diseases might be due to high population of infected stray dogs in the country. The infection rate among stray dogs might from 25-79.1% (15-17). The source for dog's infection can be due to feeding them a raw offal of slaughtered animals at home or abattoir which might be infected with a cyst of *E. granulosus*. Therefore, the environment was assumed to be highly contaminated with millions of *E. granulosus* eggs, exposing humans and animals to the threat of acquiring infection.

2. Conclusions

Although the incidence rates of hydatid disease are varied from one area to another according to the degree of personal and community hygiene, sanitation and climatic factors are relatively common in Iraq. Hydatid disease has been observed among all types of communities and population from both urban and rural regions of Iraq. Adults and children of both sexes are infected. It has been said of Iraq "if you detect an abdominal mass, there is 50% chance that is a hydatid". Therefore, an urgent and efficient preventive and control measures is essential.

Even an adequate treatment for hydatid disease is available, the morbidity is still high. The disease could occur anywhere in the human body except the nail.

Implementing a national control program should include a primary health care, health education, Proper inspection for carcasses of slaughtered domestic animals, burning or buried an infected organ or carcass, proper water supply, environmental sanitation, nutrition and mass screening. In addition, it is so essential to eradicate the stray dogs and periodical anthelmintic treatment for domestic dogs.

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Table 1. Incidence of hydatid disease among different populations in the Iraqi provinces.

Reference	Province	Highest incidence		Male No. (%)	Incidence Female No. (%)
		Age (years)	Occupation		
Benyan & Mahdi, (2).	Basrah	31-40	Women work as animal breeders.	20 (32.8)	41(67.2)
Mahdi et al., (3).	Basrah	31-50	Housewives	34 (41.5)	48 (58.5)
Molan & Baban, (18).	Babylon during 1980-1986	21-50	Housewives	105 (35.2)	193 (64.8)
Mahdi & Benyan, (11).	Basrah, children 3.6-18 years old	10-14	Children	28 (48.8)	30 (51.7)
Al-Barwari et al., (19).	Erbil during 1980-1989.	21-30	Housewives	71 (46.4)	82 (53.6)
Molan, (4).	Thi-Gar, 1-70 years old.	41-50	Housewives	40 (41.7)	56 (58.3)
Saeed et al., (6).	Arbil during 1990-1998			2459 (49.4)	2514 (50.6)
Saida & Nouraddin, (12).	Erbil	10-61	Housewives	56 (37.5)	93 (62.4)
Hama et al., (8).	Sulaimania during 2006-2011, 15->35 years old.	>35	Animal breeders	46 (46.9)	52 (53)
Mahdi et al., (20).	Nassiriyah , age 12-60 years old.	12-40	Housewives	7 (25.9)	20 (74.1)
Al-Mkhtar AS, Qasim IK, (21).	Mosul during 2012-2013, Serological examination for ages 7-70 years.	31-40	Housewives	8 (33.3)	16 (66.7)
Shakir & Hassan, (22).	Kirkuk	31-60	Housewives	(42.6%)	(57.4%)
Mahamed et al., (13).	Najaf, 5-70years old.	21-30	-	25 (39)	64 (61)
Al-Marsomy, (23).	Baghdad	31-40	Housewives	(30%)	(70%)
Issa et al., (24).	Duhok	21-30	Housewives	21 (33.9)	41 (66.1)