

Prevalence of cystic echinococcosis infestation sheep, goats and cattle in the Bayda city – Libya

Ahmad. M. H. Ekhnefer

Omar AL-Muktar university – faculty of scenes – zoology department

Email: eknefer2008@yahoo.com, Mobile: 00218923838363

Abstract

Cystic echinococcosis is the name given to the condition caused by the zoonotic Tapeworm *Echinococcus granulosus*. The tapeworm spends most of its adult life in the intestine of its (definitive hosts), canids and in particular the dogs and wolves. The tapeworm eggs become voided in the canids' faeces and as a result of ingesting the eggs, infection passes to the intermediate hosts, The importance of the study to estimate the prevalence of the parasite in the city of Bayda, as there are no studies that registered in this region, In the period 01.08.2004 to 08.01.2005 been doing field visits to massacres (alkhlele and atellal) Were examined 1565 samples, (715 sheep , 500 goats, and 350 cattle, as some intermediated hosts) in the Bayda city, and the inversion of the liver, lungs, were to determine the sex and age All intermediated hosts examined at slaughter. according results were the percentage of infection in sheep is higher than, goats, and cattle, the incidence infection in Cattle less than of goats, where (55.94, 40 ,28.57), respectively. From the study clear that there is a relationship between sex and infection, where he found that the rate of infection in females is higher than males, all Intermediated hosts in the study, Seen from result that there where if the increased age of increased incidence of infection , and that was apparent in all Intermediated hosts,

Key words: cystic , echinococcus, sheep, goats , cattle, Bayda city – Libya

{**Citation:** Ahmad. M. H. Ekhnefer. Prevalence of cystic echinococcosis infestation sheep, goats and cattle in the Bayda city – Libya. American Journal of Research Communication, 2014, 2(10): 11-22} www.usa-journals.com, ISSN: 2325-4076.

Introduction

Cystic echinococcosis is the name given to the condition caused by the zoonotic Tapeworm *Echinococcus granulosus*. The tapeworm spends most of its adult life in the intestine of its (definitive hosts), canids and in particular the dogs and wolves. The tapeworm eggs become voided in the canids' faeces and as a result of ingesting the eggs, infection passes to the intermediate hosts, commonly herbivores while grazing. However, human can become accidentally infected and hydatid cysts may develop throughout the body. Therefore, cystic echinococcosis or hydatidosis is a disease caused by the metacestode stage of *Echinococcus*. The disease is not apparent to farmers but is of considerable economic and public health importance (Ahmadi and Meshkehkar , 2011). In farm animals, it causes considerable economic loss due to condemnation of edible organs, decreased meat and milk production, reduced hide and fleece value and decrease in fecundity (Polydorou , 1981 and Romazanov , 1983). The incidence of human hydatid disease in any country is closely related to the prevalence of the disease in domestic animals and is high where there is a large dog population and high sheep production (Khuroo , 2002). The most frequent strain associated with human cystic echinococcosis (hydatidosis) appears to be the common sheep strain (G1) (Wani *et al* ., 2007). As hydatidosis is considered a serious problem for public health and the livestock economy, Abebe (2011). The aim of the study of to know prevalence of hydatid cysts in the Bayda city.

Methods

Area of study

Bayda City is located in Libya, specifically in the province of Green Mountain, the city's area is about 10 square kilometers, rises about 860 M Above sea level.

Sample collection and prevalence of the hydatid cysts

In the period 01.08.2004 to 08.01.2005 been doing field visits to massacres (alkhlele and atellal) Were examined 1565 samples, (715 sheep , 500 goats, and 350 cattle, as some intermediated hosts) in the Bayda city, has proven infection by observing the hydatid cysts in

the livers or lungs or livers - lungs of some slaughtered intermediated hosts visually, where then examine the entrails of slaughtered animals a thorough examination at the rate of 14 sacrificed sheep and 10 carcasses of goats and 7 carcasses cattle every seven days, and the inversion of the liver, lungs, were to determine the sex and age All intermediated hosts examined at slaughter.

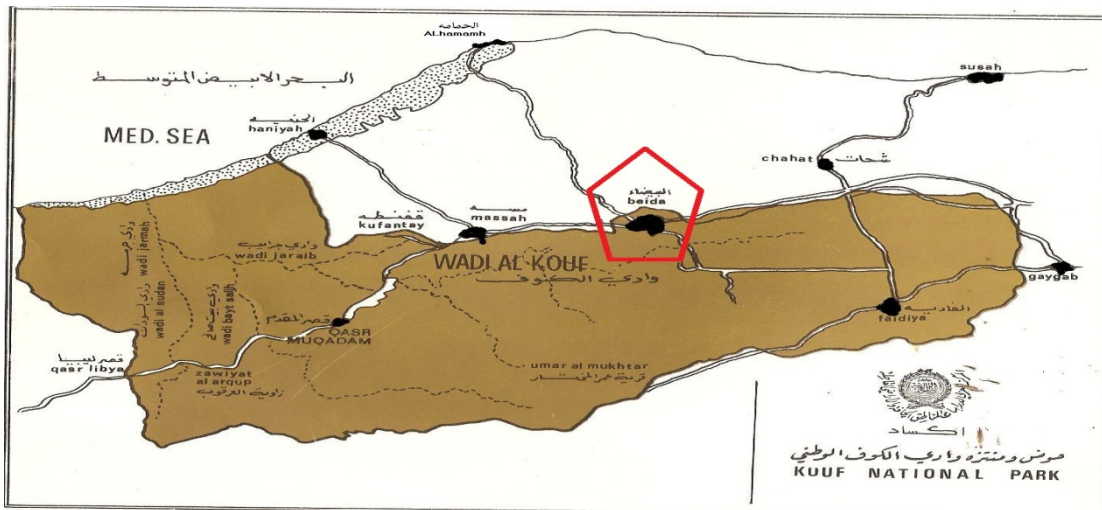


Fig (1) Map of the study area, the mark refers to the site area of study.



Figure (2) Shows of female's liver of sheep infected by hydatid cysts.



Figure (3) Shows of female's lung of sheep infected by hydatid cysts.

Statistical analysis

Statistical analysis was performed on a computer using the program MINITAB (15) by Chi-square test Chi-square test for incidence infection of overall in sheep, goats and cattle, and infection rates of males and females together for each intermediated host separately and intermediated host together, and according by age of each intermediated hosts separately and together intermediated hosts. As well as for the infection according organs .

Results

Table (1) Shows prevalence of the infection among sheep, goats and cattle

Intermediated hosts	Total .N	No.of infection	% of infection
Sheep	715	400	55.94
Goats	500	200	40
Cattle	350	100	28.57

By statistical analysis Chi-Sq, the results among sheep, goats and cattle were as follows:

P <0.05 when the degree of freedom = 2 and the chi-square value of 30.567

2. overall incidence between sheep and goats .

P <0.05 when the degree of freedom = 2 and the chi-square value of 29.924

3. overall incidence between sheep and cattle .

P <0.05 when the degree of freedom = 2 and the chi-square value of 29.157.

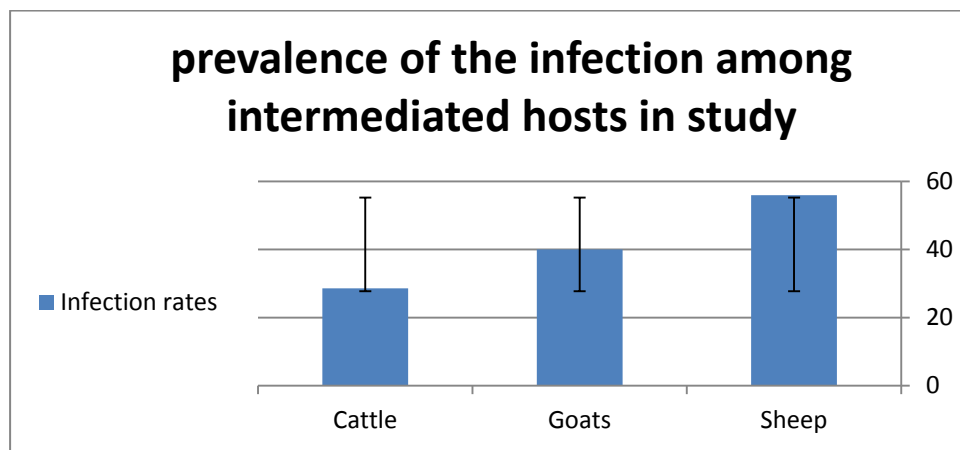


Figure (4) Shows prevalence of the infection among intermediated hosts in study.

Table (2) Shows Infection rates by sex in overall carcasses of sheep and goats and cattle

Intermediated hosts	Total . No. Examined	No. of Males infection	%Of infection	No. of females infection	%Of. infection
Sheep	715	160	22.38	240	33.57
goats	500	60	12	140	28
Cattle	350	25	7.14	75	21.43

By statistical analysis Chi-Sq, the results were as follows :

1- overall incidence between male and female sheep :

$P < 0.05$ when the degree of freedom = 1 and the value of chi-square 12.527

2- .overall incidence between male and female goats :

$P < 0.05$ when the degree of freedom = 1 and the value of chi-square 26.786

3- overall incidence between male and female cattle :

$P > 0.05$ and the degree of freedom = 1 and the value of chi-square = 21.96

4- .overall incidence between males and females of intermediated hosts in study :

$P > 0.05$ and = 2 degrees of freedom and the value of chi-square = 40.86.

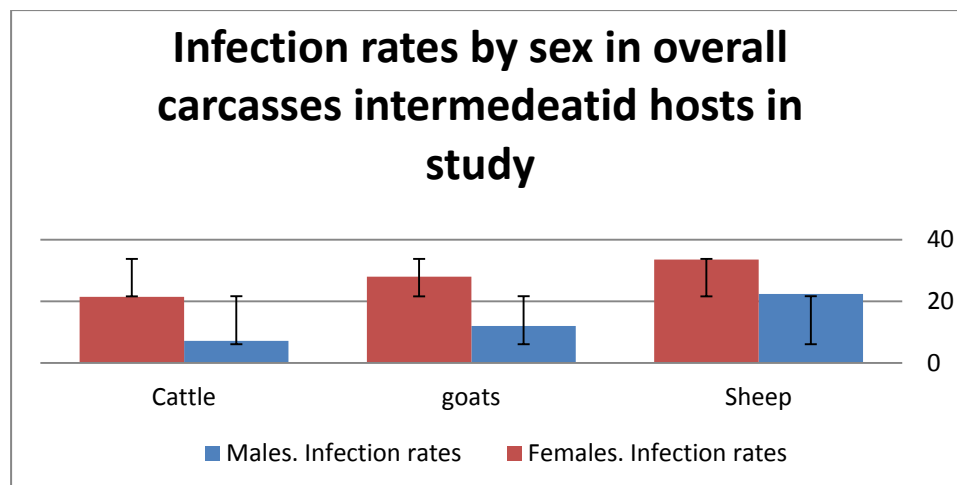


Figure (5) Shows infection rates by sex in overall carcasses intermediated hosts in study.

Table (3) Shows Rates of infection hydatid cysts according to age in the carcasses of sheep goats and cattle.

Intermediated hosts Age / Year	Sheep		Goats		Cattle	
	No.Of.Infection	%.Of.Infection	No.Of.Infection	Of.Infection.%	No.Of.Infection	Of.Infection.%
<1	0	0	0	0	0	0
>1 to 2	54	13.5	13	6.5	0	0
>2to 3	85	21.25	47	23.5	0	0
>3 to 4	115	28.75	69	34.5	12	12
>4 to 5	146	36.5	71	35.5	15	15
>5 to 6	-	-	-	-	28	28
>6 to 7	-	-	-	-	45	45
Total Summation	400	100	200	100	100	100

By statistical analysis Chi-Sq the results were as follows :

1- incidence and age of Intermediated hosts:

P <0.05 when the degree of freedom = 6 and the chi-square value of 21.030

2- incidence and age of the sheep :

P <0.05 when the degree of freedom = 4 and the chi-square value of 139.486

3- incidence and age of goats :

Pl <0.05 when the degree of freedom = 4 and the chi-square value of 91.467

4- incidence and age of the Cattle :

p <0.05 when the degree of freedom = 6 and the chi-square value of 99.042.

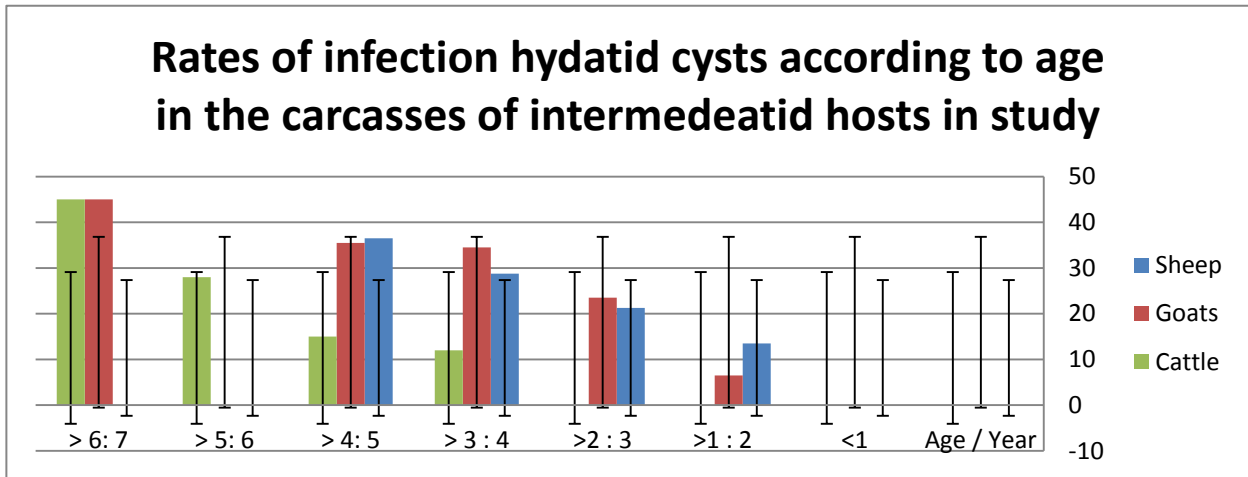


Figure (6) Shows infection rates according to age in the carcasses intermediated hosts in study.

Table (4) Shows Rates of infection according organ infection in the carcasses of sheep goats and cattle

Intermediated hosts	Liver	%	Lung	%	Liver and Lung (double)	%
Sheep	140	35	90	22.5	170	42.5
Goats	70	35	55	27.5	75	37.5
Cattle	25	25	15	15	60	60

By statistical analysis Chi-Sq the results were as follows:

1- Infection rate and injured organs of the sheep :

P <0.05 when the degree of freedom = 2 and the chi-square value of 18.820

2- Infection rate and injured organs of the goats :

P 0.289 level of significance and degree of freedom = 2 and the value of chi-square = 2.482

3- Infection rate and injured organs of the cattle :

p <0.05 when the degree of freedom = 2 and the chi-square value of 23.768

4- infection rate and injured organs of the intermediated hosts in the study :

p <0.05 when the degree of freedom = 4 and the chi-square value of 15.154.

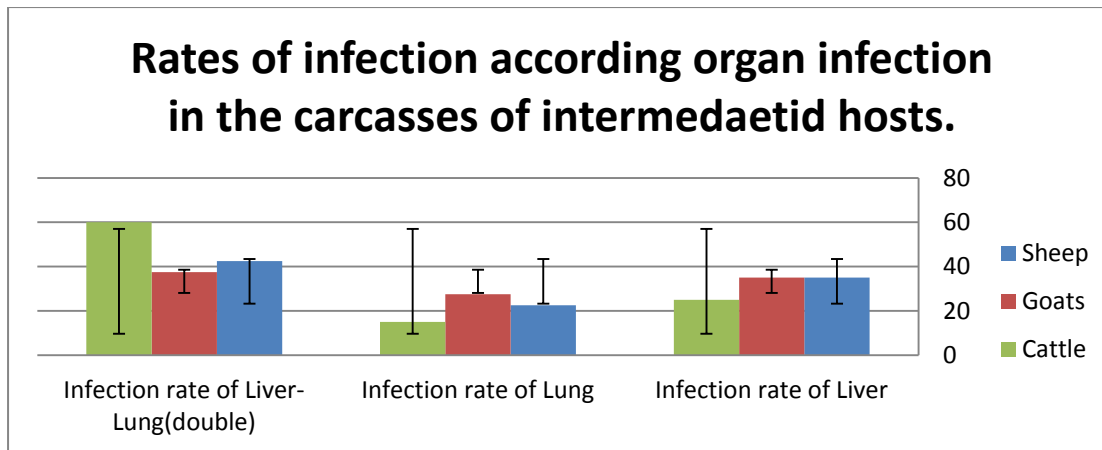


Figure (7) Shows infection rates according to organ infection in the carcasses intermediated hosts in study.

Discussion

During the visual inspection of the host moderation show that the percentage of the total infection 55.94% for sheep, goats, 40%, and 28.57% for cattle, where the agreed results in the fact that sheep are more affected of other species with all studies, noted Tashani *et al* (2002) infection in his study that 20% of sheep, goats, cattle and 3.4% and 11% indicated (Abubakar *et al* ; 2004) that the percentage of infection to sheep and in goats was 18.5% and in to cattle 15.29. As for the goats and cattle, has contradicted the results of the study with the fact that the outcome was injured goats less than injured cattle, whereas the incidence of large sheep due to the fact that the strain that infects sheep, symbolized by the G1 is more strains prevalent in the world and their life cycle include in the base (sheep, dogs) and can infect host other herbivores and carnivores and the fact that females are available and significantly more than other species led to be a sheep more infection and is an important tool in maintaining the parasite's life cycle and increasing endemic and spread of (Thompson & McManns, 2002).

As for the few rate of infection with cattle may be this, see (for the reasons immunological or physiological digestive or she has judged in the fact that some of the cattle that have been tested is a hybrid strains of national and other external and therefore there has been change hereditary may be for the better, which led to the strengthening of the immune

with cattle or change the genetic makeup of the host, which has become a stranger to the parasite) and this needs to study the dedicated and focused on this side or may be a parasite strain is not the original strain that can infect cattle than cattle of resistance.

As for linking infection to sex, it is through the study found that the incidence of females in the host moderation is greater than the infection males and agreed to study with all previous studies on this parasite from this side where you get all of Tashani *et al.*, (2002), Abubakar *et al* ; (2004) on the same results. This result is due to keep females for long periods of time for the purpose of production and reproduction, and thus increase the chance of being infected (Tashani *et al.*, 2002) may be to see the causes of immune (Saad and Al-Zubaidi 1989 and Sawa, 1986). It may be the role of sex hormones as well. As most of the parasites consistent life cycles with periods of reproduction host especially in appropriate circumstances such as the separation of spring and summer, and it kind of maintaining the kind of parasite in order to guarantee themselves good conditions of temperature and humidity as well as the opportunity to move the largest since the nutrition in the spring and summer depends on vegetation neighborhood not feed nutrients and herbs saved, and the fact that females are considered a big appetite in eating during pregnancy and lactation therefore it is susceptible to more than males. (Sanusi and Hun, 1990).

When trying to find a relationship between age and infection found that the greater the age of the intermediate hosts in the same species of infection and increased percentage of this is due to several reasons, including:

- 1- the longer the age of the animal whenever the chance exposed to infective larva
- 2- and that the period of growth and development of the hydatid cysts and take a long time to appear (Soulsby, 1982).

When looking for a relationship depending on the organs infection, the sheep was the percentage of liver infection 35%, lung 22.5% and liver- lung (double) 42.5% ,this means that the percentage of liver iinfection is greater than lung infection and the incidence of double infection is greater than of liver infection, in cattle as well as the percentage of liver infection, 25% of lung 15% and lung- liver 60%, in goats the incidence of infection were referring to the same previous result though homogeneous when analyzed statistically in the liver where it was 35% and 27.5% of the lung, liver and lung of 37.5%.

Agreed to study with Abubakar *et al* ; (2004) in terms of the infection (double) (liver and lung) where the infection rate (64.86% in sheep and 61.53% in of cattle), higher than the incidence of individual cattle and sheep, but differed in terms of the incidence of infection the individual that the percentage as a record of injured were higher in lungs than liver of infection , of liver percentage of estimated 8.10% and lung 27.02% in sheep, whereas cattle agreed outcome in terms of the liver infection largest since record percentage of infection to the liver 30.76% and lung 7.69% also agreed to study with the study (Tashani *et al.*, 2002) of liver infection where most of the lung in sheep and goats, while in of cattle found that the distribution of infection among members converged. Active infective larva (Onchosphere) due to bile in humans and induced gastric juice in of ruminants (Marquardt *et al*,2000). and penetrates the wall of the small intestine down to the vessel lymphatic or mesenteric rosettes and move them to different parts of the body and often enters the portal vein hepatic carried by blood to the liver and to a lesser extent the other members (Gottestin, 1992).

In regard to the incidence of double by high they are caused by the exacerbation of the disease and his appearance in the liver first until it reaches a degree of stability immunity against this disease then spread from the liver to the lungs and other organs, and when the stability of the immune be the chance of spreading the disease faster than the first, and thus the infection is clear in the Members double or maybe the animal may be exposed to shock anaphylactic shock)), leading to the explosion of the Hydatid cysts and spread in the body where that every protoscolices may be filial cyst (Bin Rashid , 2000).

References

- Abebe, F. and Yilma, J. (2011): Infection prevalence of hydatidosis (*Echinococcus granulosus*, Batsch, 1786) in domestic animals in Ethiopia: A synthesis report of previous surveys. *Ethiop. Vet. J.*, 15 (2), 11-33.
- Abu-Bakr, A.A.; Muhammad, F.M. A., & Fath, A. (2004): The spread of hydatid cysts in the domestic and imported animals in the city of Sabha. Paper presented to the Conference of the life sciences .Faculty of Science , University of Sabha.
- Ahmadi, N.A. & Meshkehkar, M. (2011): An abattoir-based study on the prevalence and economic losses due to cystic *Echinococcosis* in slaughtered herbivores in Ahwaz, south-western Iran. *J. Helminthol.* 85, 33–39.

- Bin Rashid, Mohammed Bashir. (2000). Diseases of worms and other parasites dangerous. The first edition. International House Investment cultural .s Egypt 73_77. Gottstein, B. (1992): Molecular and immunological diagnosis of *echinococcosis*. Clin. Micro. Rev., 5 : 248-261.
- Khuroo, M.S. (2002). Hydatid disease: current status and recent advances. Ann. Saudi Med. 122, 56-64.
- Marquardt, W.C.; Demaree, R.S. & Greve, R.B. (2000): Parasitology and vector Biology, 2th ed., Harcourt academic press ,Sandiego, London, Boston, NewYork, Sydney, Tokyo, Toronto : 325-339.
- Polydorou, K. (1981): Animal health and economics. Case study: echinococcosis with reference to Cyprus. *Bul. Int. Epz.*, 93, 981-992.
- Romazanov, V.T., (1983): Evaluation of economic losses due to echinococcosis. In: LysendoA, editor. Zoonosis control: collection of teaching aids for international training course vol. II. Moscow: Centre of International Projects GKNT, pp 283–85.
- Saad. R and Al-Zubaidi, T. (1989). Immunology. First edition. University of Baghdad. P 301-304.
- Sanusi, I. L an Hun, A. A (1990) . Introduction to Immunology Vet. First edition. Al-Fateh University . P411
- Soulsby ,E . J . L . (1982) Helminths , Arthropods , Protozoa & domesticatd animals 7th .ISBN 0-7020-08930-6.
- Sawa.A .A. (1986). Entrance in veterinary immunology. First edition. Mosul University. P 233.
- Thompson, R.C.A., & McManus, D.P.(2001): Aetiology: parasites and life cycles. In:Eckert, J., Gemmell, M.A., Meslin, F.-X.,Pawlowski, Z.S.(Eds.), Manual on *Echinococcus* in Humans and Animals a Public Health Problem of Global Concern .WHO/OIE, Paris. World Health Organisation, Geneva, pp.1–19.
- Wani, M.M.; Durrani, A.M.; Shafi, M.; Wani Mubbashir, M. & Khan, M.; (2007): Hydatid Disease of the Soft Tissues of the Lower Limb: case report. *JK-Practitioner.*, 14, 104-106.