

COMPARATIVE ASPECTS ON FERTILITY AND VIABILITY OF HYDATID CYST FROM GOAT,CAMEL AND BUFFALO IN THI- QAR PROVINCE-SOUTHERN IRAQ

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ABSTRACT

The fertility and viability rates of hydatid cysts obtained from livers and lungs of goat,camels and buffaloes were investigated .Out of (659) cysts (198 from goat,241 from buffaloes and 220 from camels) .examined ,520(164 from goat ,156 from buffaloes and 200 from camels were fertile (containing living protoscolices).The mean viability rates in the liver cysts of goat camel and buffalo were (77.4%, 76.8% and 76.7%) respectively whereas those in the lung cyst of the same hosts,in the same order were 81.2% 75% and 84.65% respectively. The growth rate of lung cysts was slower than those of liver in all hosts investigated.

Three hosts investigated seem to be suitable hosts for *Echinococcus granulosus* .However ,goats seem to be the most significant host that contributes actively in perpetuation of life cycle of this parasite in Iraq .

INTRODUCTION

Hdatidosis caused by the larval stage of the taeniid ,*Echinococcus granulosus* (Batsch ,1786) is a zoonosis of world wide concern. The global distribution of the parasite is due in part to its ability to adapt to a wide variety of domestic and wild intermediate hosts (1) .

In Iraq work has been done in which different approaches to the problem of prevalence of the disease have been included (2,3,4) . One of these problems which have nearly escaped the thoughts of many workers in this country is the viability of the protoscolices in the fertile cysts,although some workers(5,6,7) have tackled the problem of fertility of hydatid cysts bearing in mind that the number of protoscolices and their viability is an important factor in determining the intermediate hosts which actually contribute in perpetuating the life cycle of the disease in Iraq . Apart from the work done by(8) on sheep,camel and buffaloes origin from middle and south parts of Iraq .

MATERIALS AND METHODS

659 cysts (198 from goats ,241 from buffaloes and 220 from camels) were caused in the present study. Infected organs were removed immediately after slaughtering the animals in the central abattoir of Thi-Qar province and brought back to the laboratory within one hour .

Cysts were measured and counted after freeing them from the surrounding tissue. The hydatid fluid was recovered and internal germinal membranes were washed 3-4 times with the fluid aspirated from the cyst. The protoscolices were counted using aliquots of 200 μ L spread on microscope slides and were examined under a compound microscope(9). The average of 3 counts was calculated and the number of protoscolices in each cyst was estimated accordingly ,the viability rate was determined by counting protoscolices that showed actively beating flame cells under the compound microscope (10 x).

The mean viability rate was estimated after the examination of 3 slides prepared from each cyst. It was ascertained that dead protoscolices are distinctly smaller than viable ones and brownish in colour. Student t - test was applied to the results to establish a significance between the mean. Out of 659 cysts collected, 520 were fertile and 139 were sterile from the three hosts investigated.

RESULTS

Table (1,2) shows the relationship between the diameter of hydatid cyst and the mean number of protoscolices (MNP) in the cysts isolated from the livers and lungs of infected goats, camels and buffaloes. It is obvious from this table that as the cyst grows there is a continuous increase in the (MNP) in cysts obtained from liver and lung of all hosts investigated. The (MNP) in the cysts obtained from liver and lung of camels was always higher than those obtained from other hosts for all sizes. The (MNP) in liver cysts of goats and buffaloes was significantly higher ($p < 0.05$) than that in the lung cysts when the cysts were more than 3 cm in diameter. On the other hand, no significant difference was observed in the case of camel cysts. (Figure .1) illustrates the total growth rate of cysts as reflected by the (MNP) counted for each cyst size category. Evidently lung cysts showed a slower total growth rate than liver. Both organs showed an initial slow phase which was extended up to cyst size of 3 cm in the liver cysts and up to 4 cm in the lung cysts for all hosts investigated. In both liver and lung cysts of all hosts studied a dramatic increase in the total MNP occurred in the cyst size of 3 - 5 cm in the case of liver cysts and 4 - 6 cm in the case of lung cysts and the growth of camel cysts was faster than that of goat cyst followed by buffalo cyst in both locations.

The fertility rate of liver cysts from goat, camel and buffalo was 83.3%, 89.4% and 66.6%, respectively whereas that of lung cysts from the same hosts in the same order was 81.8%, 90.4% and 63.3% respectively. Table (3). Despite the obvious differences in the number of protoscolices sustained in the two different organs studied, there was no significant difference between the present viability of protoscolices obtained from these two locations (Figure .2). The mean viability rates (MNP) in the liver cyst of goat, camel and buffalo were 77.4%, 76.8% and 76.7%, respectively whereas those in the lung cysts of the same hosts in the same order were 81.2%, 75.4% and 84.6%, respectively. Table (4, 5, 6).

Table (1) : Relationship between cyst diameter and the mean number of protoscolices from liver cysts in different hosts in Thi-Qar province

Cyst diameter (cm)	Mean total number of protoscolices ($\times 10^3$) per cyst of liver		
	Goat	Camel	Buffalo
<2	6.7 (20)	—	4.1 (15)
2-----2.9	20.2 (12)	59.4 (21)	11.6 (12)
3-----3.9	59.8 (18)	69.9 (28)	49.0 (4)
4-----4.9	140.9 (15)	161.2 (18)	79.2 (12)
5-----5.9	244.7 (10)	218.2 (28)	103.9 (18)
6-----6.9	—	—	—

Table (2) : Relationship between hydatid cyst diameter and the mean number protoscolices in lung cyst in different hosts in Thi –Qar province

Cyst diameter (cm)	Mean total number of protoscolices (x10 ³) per cyst of liver		
	Goat	Camel	Buffalo
<2	4.9 (30)	—————	1.8 (12)
2-----2.9	12.5 (10)	57.6 (16)	7.5 (25)
3-----3.9	26.7 (9)	88.5 (35)	16.0 (16)
4-----4.9	43.1 (8)	130.4 (30)	48.6 (24)
5-----5.9	124.6 (24)	168.2 (24)	76.7 (12)
6-----6.9	177.5 (8)	—————	112.2 (6)

Table (3) : The fertility rate of liver and lung cysts from goats ,camel and buffalo .

Host Organ	Goat	Camel	Buffalo
Liver	83.3 %	89.4 %	66.6 %
Lung	81.8 %	90.4 %	63.3 %

Table (4): The mean viability rates (MNP) in the liver and lung cysts from goat ,camel and buffalo .

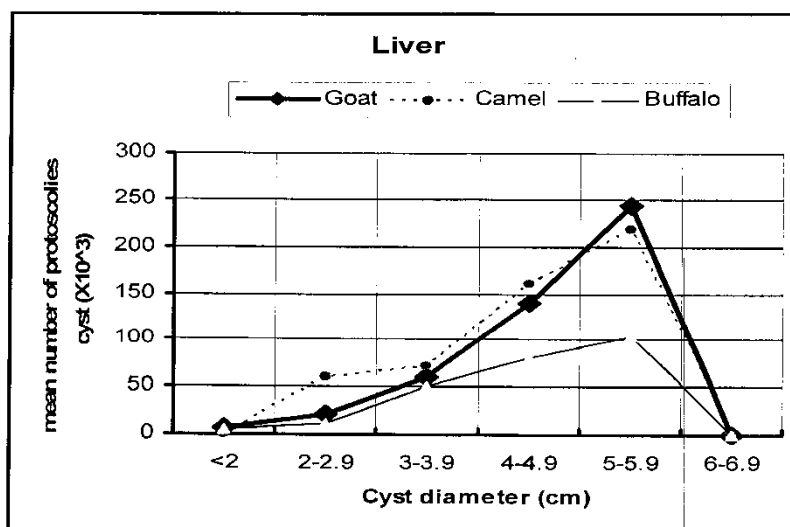
Host Organ	Goat	Camel	Buffalo
Liver	77.4 %	76.8 %	76.7 %
Lung	81.2 %	75.4 %	84.6 %

Table (5) : Percentage of viability in the liver from goat ,camel and buffalo with cyst diameter .

Host Cyst diameter (cm)	Goat (%)	Camel (%)	Buffalo (%)
<2	70.3	—————	68.3
2-----2.9	80.1	80.3	82.4
3-----3.9	75.2	74.4	75.1
4-----4.9	80.3	79.1	77.3
5-----5.9	81.2	73.2	80.2
6-----6.9	—————	—————	—————

Table (6) : Percentage of viability in the lung from goat ,camel and buffalo with cyst diameter .

Host Cyst diameter (cm)	Goat (%)	Camel (%)	Buffalo (%)
<2	79.2	—————	80.2
2-----2.9	85.1	76.3	78.1
3-----3.9	84.4	71.1	84.2
4-----4.9	82.5	74.1	85.1
5-----5.9	80.3	80.2	88.2
6-----6.9	75.1	—————	92.3



Figure(1) : Relationship between cyst diameter and mean number of protozoa for liver and lung cysts of different hosts (in Tabel 1, 2)

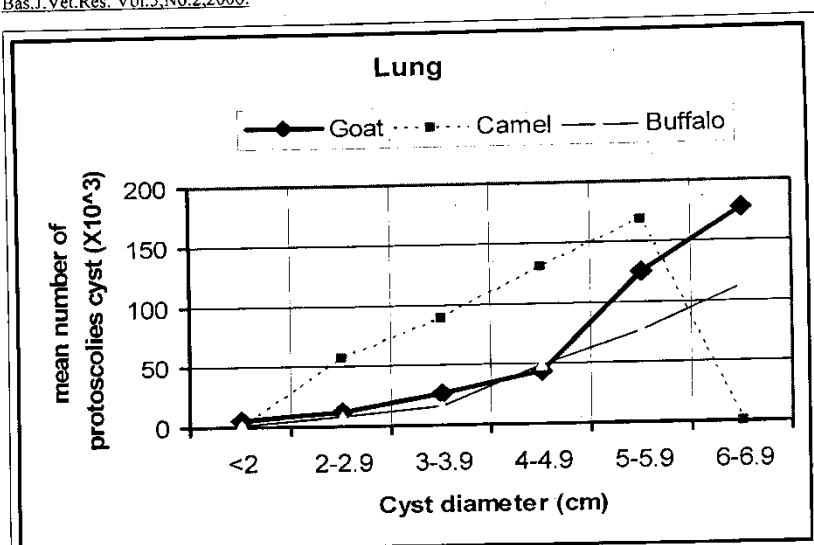
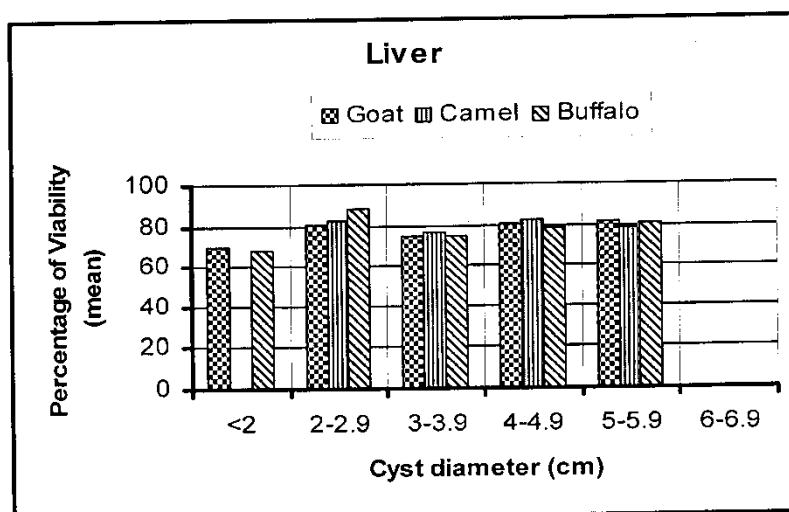
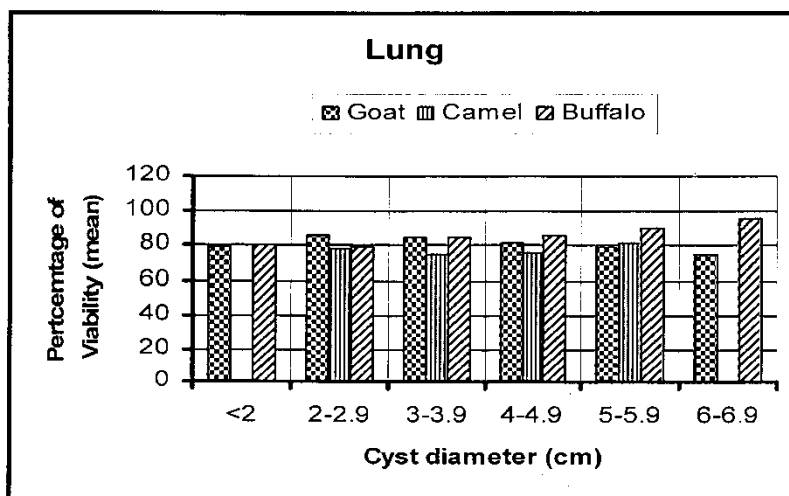


Figure (2) : Relationship between mean cyst diameter and viability rates of hydatid in Table ,5). (cysts from liver and lung of goats ,camels and buffaloes





DISCUSSION

The present study has focused on the degree fertility and viability of hydatid cysts recovered from livers and lung of goat ,camels and buffaloes .As far as these two terms (Fertility and Viability) are concerned agree with(9) in that although information on fertility of cysts based on the percentage of animales with fertile cysts a monge all cysts recovered from infected animals are of considerable importance ,the true representation of fertility in terms of the importance of diseae transmission (8) for lung cysts (76.0%) but less than that reported by the same author on liver cysts (100%). .

From the results obtained in the present study ,the high fertility and viability rates of cysts obtained from the three hosts investigated show that goats ,camels and buffaloes are suitable intermediate hosts for *Echinococcus granulosus* and that they all contribute in maintaining the life cycle of this parasite in Iraq .

(10) found that in Aligarh India ,buffalo is the most significant host in maintaining the life cycle of this parasite compared to camels ,sheeps ,goats and pigs(1) ,on the other hand found that in Masailand ,Kenya goats and sheep are the most suitable hosts for this parasite compared to cattle . This discredpancy in the results could be attributed to the degree of adaptation of this parasite to different intermediate hosts . Here in Iraq ,although the three hosts investigated seem to play a significant role in perpetuation of the life cycle of this parasite ,goats seem to be the most suitable one since camels and buffaloes are less frequently slaughtered compared to goats . These observations should very well be taken in to consideration when determining the epidemiology of hydatidosis in Iraq .

مقارنة حيوية وخصوبة الأكياس العذرية من أكباد ورنات الماعز والجمال والجاموس في محافظة ذي قار جنوب العراق

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الخلاصة

أجريت الدراسة الحالية على (659) كيسا عذريا جمعت من أكباد ورنات الماعز والجمال والجاموس مصابة طبيعيا بواقع (198) كيسا من الماعز و (241) من الجاموس و (220) من الجمال فحست (520) كيسا بواقع (164) من الماعز ، 165 من الجاموس و 220 من الجمال) وكانت ذات خصوبة من حيث احتوائها على رؤيسات اولية حية . أوضحت النتائج الحالية ان معدل (نسبة) الحيوية في الأكياس المائية من أكباد الماعز والجمال والجاموس كان (76.0%، 76.8%، 77.47%) على التوالي في حين كان معدل الحيوية في الأكياس العذرية من رنات نفس المصانف هو (81.2%، 65.0%، 84.6%) على التوالي . كان معدل نمو الأكياس العذرية في الرنات اقل بكثير عما هو عليه في الاكباد في جميع المصانف المدروسة . تبين من المصانف الثلاثة المدروسة بانها اكثر ملائمة من بقية المصانف للمشوكات الحبيبية ماعدا ان الماعز قد اظهر فرقا معنويا عاليا حيث كانت اكثر فعالية في ديمومة دورة حياة الطفيلي في العراق .

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