Proceedings of the Third Annual Meeting for Animal Production Under Arid Conditions, Vol. 1: 143-149

Cystic Echinococcosis (Hydatidosis) in Sheep, Goats, Cattle and Camels in Shahat Abattoir, Al-Jabal, Libya

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ABSTRACT

An infection rate of 8.4% with cystic echinococcosis (Hydatidosis) was recovered among 1,050 sheep, goats, cattle and camels in Shahat abattoir in Al-Jabal, Libya. Of 554 sheep, 48 (8.7%) sheep were infected. Of 338 goats, 18 (5.4%) goats were infected. Of 124 cattle, 8 (6.4) cattle were infected and of 40 camels, 14 (35.0%) camels were infected. The animals were of both sexes and of various ages.

The infection of 87.2% of infected sheep was in the liver, 33.4% was in the lungs, 6.3% was in the peritoneal cavity, and 2.4% was in the spleen. Meanwhile, the infection of 61% of infected goats was in the liver, 55.5% was in the lungs and 5.5% was in each of the spleen and the kidneys.

As for the infection of cattle, 75.0% of the infection was in the liver, 37.5% was in the lungs and 12.5% was in the spleen. In camels, however, most of the infection, 78.5%, was in the lungs and only 35.7% was in the liver, with only a single case (7.1%), the infection of which was in the heart. There were also many mixed infection cases.

The cysts of all infected cattle, but one cow (12.5%), were sterile, while the cysts of the other animals were mostly fertile. The fertility rate of sheep cyst was 79.2%, of goats was 61.0% and of camels was 57%.

Key words: Cystic Echonococcosis, Livestock, Infection, Libya.

INTRODUCTION

During the last three decades of the current century, several reports have been published indicating that cystic echinococcosis is endemic in human beings and animals in Libya. Dar and Taguri, (1978); Tagur and Dar, (1978); Aboudaya, (1985a,b) reported an annual rate of 70-100 confirmed surgical cases in the northern cities of Libya, according to the hospital records. Gebreel *et al., (*1983) indicated an infection rate of about 10% among the children and young adults from the environs of Benghazi, Libya, by using ELISA test. Shambesh *et al., (*1992); Shambesh *et al.,* (1995); Shambesh*,* (1997), showed the prevalence of 1.4-2.0% rate of infection among people who were screened by using ultra sound technique. They also found that the infection rate with cystic echinococcosis increased with age. The female: male ratio was 1:1 and 62% of the patients kept dogs at their premises Shambesh(1997).

As for the infection of animals, Gusbi *et al.,* (1987) have shown that 7.9% of sheep that were slaughtered in the abattoirs of many of mid-north and west northern cities were infected. In a follow up study, Gusbi *et al.,* (1990) indicated that 3.5% of goats, 5.4% of cattle and 35.9% of camels from the abattoirs of 14 Libyan cities were infected. More of the sheep, goats and cattle were infected in their livers than in their lungs. Camels, however, were more infected in their lungs than in their livers Gusbi et al.,(1990).

In a recent study, Al-Khalidi, (1995) showed that 1% of the surgical cases referred to Al-Thawrah Hospital in El-Beida, Libya for 5 years were confirmed to be cystic echinococcosis. No confirmed data are available so far, however, about the infection rate among sheep, goats, cattle and camels slaughtered for human consumption in Jabal Al-Akhadar area. This study therefore, was designed to know the rate of infection among animals slaughtered for human consumption.

MATERIALS AND METHODS

The information about the slaughtered animals was gathered from Al-Shabat Abattoir, 20 Km east of El-Beida, Libya. About 90-150 sheep and goats, 5-12 cattle and 0-4 camels are slaughtered daily in this abattoir. The information was gathered through 15 visits to

examine 40-50 sheep and goats and, through the same number of visits, to examine 8-12 cattle and camels in each visit.

The livers, the lungs, the heart, the spleen and the mesentery of each animal were examined grossly . Each organ was also incised once or twice with a knife. Whenever and wherever the cysts were present, they were removed and incised to determine the fertility and/or sterility of the cyst.

RESULTS

Table 1 shows the number and the infection rate of the infected animals. It was found that of 1,050 carcasses, 88 animals were infected (an infection rate of 8.4%). Of 554 carcasses of sheep of various ages and of both sexes, 48 (8.7%) sheep; of 332 goat carcasses, 18 (5.4%) goats; of 124 cattle carcasses, 8 (6.4%) cattle; and of 40 camel carcasses, 14 (35.0%) camels were infected.

Table 1: Prevalence of cystic echinococcosis in sheep, goats, cattle and camels slaughtered for human consumption in Shahat Abattoir.

Animals species	No. of animals	No. of positives	% of positives
Sheep	554	48	8.7
Goats	332	18	5.4
Cattle	124	8	6.4
Camels	40	14	35.0
Total	1050	88	8.4

Data on the distribution of the cysts in the infected organs are shown in table 2. The liver of 42 (87.2%) sheep; the lungs of 16 (33.4%); the viscera of 3 (6.3%); and the spleen of 1 (2.4%) sheep had cysts and about 25% sheep and mixed infection. Of 18 goats, 11 (61%) goats had cysts in their liver; 10 (55.5%) goats in their lungs;

1 (5.5%) goat in its spleen; and 1 (5.5%) goat in its kidney. Around 40% goats carried mixed infections.

Table 2: The location of the cysts in the organs of the infected animals.

Location	Sheep		Goats		Cattle		Camels	
	No.	%	No.	%	No.	%	No.	%
Liver	42	87.2	11	61.0	6	75.0	5	35.7
Lungs	16	33.4	10	55.5	3	35.5	11	78.5
Viscera	3	6.3	-	-	-	-	1	7.1
Spleen	1	4.2	1	5.5	1	12.5	-	-
Kidney	-	-	1	5.5	-	-	-	-
Heart	-	-	-	-	-	-	1	7.1

Of infected cattle, 6 (75.0%) cattle's liver; 3 (35.5%) cattle's lungs; and 1 (12.5%) cattle's spleen had cysts in them. Of 14 infected camels, 11 (78.5%) camel's lungs; 5 (35.7%) camel's liver; 1 (7.1%) camel's heart; and 1 (7.1%) camel's viscera had cysts in them.

Most of the cysts of sheep 79.2% (38 sheep); of goats 61.1% (11 goats); and of camels 57.1% (8 camels) were fertile. Most of the cattle cysts (87.5) percent (7 cattle), however, were sterile and the cysts of only one cow were fertile. The cysts were of various sizes and their number varied between 1-14 cysts in each animal.

DISCUSSION

The present study showed that cystic echinococcosis is spreading among farm animals, in addition to its presence in human beings in Jabal Al-Akhdar area (Al-Khalidi, 1995). The spreading of

infection is an indication of environmental contamination with the eggs of *Echinococcus granulosus* (Schwabe, 1968). Although the infection rate of sheep was 8.7%, it was lower than the rate of 12.7%, reported by Gusbi *et al., (*1987), and of 50.9% by Ibrahem and Gusbi, (1997) from many mid north and western cities. These variations of the infection rates could be due to the variations in the temperature, environmental conditions, and the nature of the pasture and the way of raising and grazing of these animals. The age of the animals could be another factor in these variations (Soulsby, 1982 and Shambesh, 1997). Further more, the sheep have more chances of exposure to *E. granulosus* from dogs (Gusbi *et al.,* 1987).

The rate of infection of goats 5.4% is less than that of sheep and this may be due to the nature and the way of their feeding. This rate is, however, similar to the rates reported by Ibrahem and Gusbi (1997) of 5./1% in Khumis; 5.5% in Benghazi; and 8.2% in Sirt; and to 3.5% which was reported by Gusbi *et al.,* (1990). The rate of infection of cattle was also similar to that of the rate of goats in this report and similar to that of 6.4% reported by Aboudaya (1985a,b) in Tripoli and to that 5.7% reported by Gusbi *et al.,* (1990) from many cities. However, it is interesting to note that most of the cattle cysts were sterile. Therefore, their role is very minor in keeping the cycle of the parasite going in nature. The cysts nevertheless, have dramatic effects on infected animal's health, milk production and calving (Soulsby, 1982).

The most interesting rate of infection is in camels, which was as high as 35%. This means that one out of three camels was infected. The infection rate was also high among the others' findings. For example, Aboudaya (1985a,b) reported a rate of 27.7% and Gusbi *et al.,* (1990) reported a rate of 16-50% from several cities. This is probably due to the age for it is well known that most of the slaughtered camels in Libya are of old ages and at the end of long working life (Gusbi *et al.,* 1990). It is also known that there is a high correlation between the infection and the age (Soulsby, 1982 and Shambesh, 1997).

The liver was the most common site of infection in sheep, goats and cattle. The lungs came in the second place in the present study animals. This is mainly due to the fact that the liver is the first organ the blood flows through after leaving the intestine. Therefore, most of the oncospheres hatched in the intestine are filtered in it (Soulsby, 1982). The ones that are not trapped in the liver are passed

to the lungs and to the other organs. In camels however, the rate of infection of the lungs was higher (78.5%) than that of the liver (35.5%). This is probably due to the infection through Gibli which is a hot and a dry wind blows from the south of the country is more than the infection through digestive system (Gebreel *et al.,* 1983).

Thus the four species of the farm animals slaughtered for human consumption are infected with cysts. Of the four species, sheep are the most important intermediate host. Camels came in the second place because they are slaughtered in less numbers. This is probably due to higher frequency and intensity of the infection, higher proportion of fertile cysts and involvement of many organs in infection. The role of camels however, remains unclear in relation to dog-man cycle. Goats and cattle are of less importance, for the first is less demanding and the second is carrying mostly sterile cysts. Therefore, there is a necessity for a control program to solve all of these complications, whether in human beings or in animals.

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