

AN ABATTOIR SURVEY OF METACESTODES AMONG SLAUGHTERED RUMINANTS AT AL-QASSIM AREA, SAUDI ARABIA

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SUMMARY

An abattoir survey of a total of 6358 animals slaughtered at Bureidah abattoir, Saudi Arabia, throughout the year of 1997, revealed that 6.0 per cent of 2742 camels, 14.90 per cent of 3045 sheep, 29.48 per cent of 312 goats and 3.08 per cent of 259 cattle were found to be infected with metacestodes. The overall rate of infection with the parasite was 11.32 per cent, being 13.51 per cent for the imported breeds and 9.65 per cent for the indigenous one. The calcified cysts were the most predominant metacestodes (8.57%) among the slaughtered ruminants. The majority of the cysts were found in liver. Both hydatid cyst and *Cysticercus tenuicollis* were recorded with nearly equal incidence (1.27 and 1.25%, respectively). The other metacestodes, *Cysticercus bovis* and *C. ovis* were observed with comparatively lower infection rate (0.13 and 0.29 %, respectively). Detailed prevalence of the metacestodes for every positive animal was recorded in the study.

INTRODUCTION

Metacestodes is the larval stage of the tapeworms inhabiting in intermediate hosts. The Middle East, southwestern Asia and the Mediterranean coast were considered of high endemic area for metacestode infection (Acha and Szyfres, 1987). The parasite is of economic and public health importance. The most obvious economic losses are caused by the confiscation of the viscera especially livers and sometimes all carcasses and also reduce the meat, wool and milk production. Little information is available on the prevalence of metacestodes in Saudi Arabia. The studies which were carried out during the last 10 years have recorded the existence of Echinococcosis and Cysticercosis among the slaughtered ruminants at Jeddah (Ghandour *et al.*, 1989; Saleh and Ghandour, 1983), Al-Hasa region (Cheema *et al.*, 1988) and in Bureidah (Farah *et al.*, 1984; Al-Saif *et al.*, 1997). This paper reports the incidence of the different species of metacestodes among the slaughtered ruminants at Bureidah abattoir.

MATERIALS AND METHODS

A survey on metacestodes was conducted from October to December 1997 at Bureidah abattoir. During this period, 6358 animals were slaughtered comprising of 2742 camels, (2362 indigenous and 380 imported), 3045 sheep (857 indigenous and 2188 imported), 312 goats (127 indigenous and 185

imported) and 259 crossbred Friesian cattle (all indigenous). Each carcasses was examined grossly as well as using techniques described by Gracey and Collins (1992).

RESULTS

A total of 6358 animals comprising 2742 camels, 3045 sheep, 312 goats and 259 cattle, were examined for the existence of metacestodes in a period from October to December, 1997 at Bureidah abattoir. It has been found that the overall infection percentage among the slaughtered ruminants was 11.32 per cent (Table 1) being 13.51 per cent for imported breeds and 9.65 per cent for the indigenous one. The most prevalent parasite among the metacestodes was the calcified cyst (Table 2), and it was located mostly in the liver tissue and rarely in lungs. Both of hydatid cysts and *Cysticercus tenuicollis* were recorded with nearly equal infection percentage (1.27 and 1.25 %, respectively). The incidence of *Cysticercus ovis* among sheep and goats was slightly higher than that of *C. bovis* collected from cattle and camels (Table 2).

In camels, it has been found that 166 (6.05 %) of the examined camels were infected with metacestodes (Table 1). The incidence was higher in the imported breeds than the indigenous one. The calcified cysts were the most prevalent metacestodes and the liver was more frequently affected than lungs. The number of the parasite observed in the infected liver varied from one to uncountable numbers. The cysts were

observed on both surface and parenchyma of the organ. The size of the cyst was usually 0.5 cm in diameter. Echinococcosis was observed in 7 (0.25 %) out of 2742 examined camels and the infection was only recorded from lungs. *C. bovis* was observed once (0.07 %) in the heart muscle in calcified form.

Table 1: The number of slaughtered ruminants and percentage of infection with metacestodes at Bureidah abattoir, 1997

Species		Animal Examined		
		No.	Infected	
		No.	No.	%
Camel	Indigenous	2362	100	4.23
	Imported	380	66	17.36
	Overall	2742	166	6.05
Sheep	Indigenous	857	215	25.08
	Imported	2188	239	10.92
	Overall	3045	454	14.90
Goats	Indigenous	127	25	19.68
	Imported	185	57	36.21
	Overall	312	92	29.48
Cattle	Imported	259	8	3.08
	Overall for all species	6358	720	11.32

In sheep out of 3045 slaughtered, 454 (14.90 %) were found infected with metacestodes. The infection rate among the indigenous breed was double that of the imported one (Table 1). Calcified cyst was the most predominant metacestodes (10.41 %) and usually inhabits liver tissues. *Hydatid cyst* was also observed with low infection rate (2.13 %), and had the predilection seat in liver, lung and rarely spleen. *C. tenuicollis* was also recorded with the incidence of 2.10 per cent. It was mostly collected from abdominal cavity, mesentery on the surface of all organs even uterus and urinary bladder. *C. ovis* was really detected (0.26 %) from sheep and it was only collected from the heart muscle.

In goats, the survey on 312 slaughtered goats revealed the high incidence (29.48 %) of metacestodes than any other examined ruminants. The infection rate was high in the imported breed than the local one (Table 1). The incidence of the calcified cyst in goats was the double than that of sheep. Also, the infection with *C. tenuicollis* was double than that of sheep, while the incidence of *hydatid cyst* in the hosts was nearly equal (Table 2). *C. ovis* was observed in the heart muscle of two goats giving the minimum incidence of the metacestodes in the host.

In cattle, the collected metacestodes from cattle were, the calcified cysts, as usual the most frequent parasite observed only in liver. *C. bovis* was recorded from 2 (0.77 %) out of 259 examined bulls, the infection was in heart and tongue muscles. *C. tenuicollis* was observed once in bull and it was located in the perirenal area.

DISCUSSION

In the present study, the overall infection percentage with hydatidosis among the slaughtered ruminants, either imported or indigenous breeds was 1.27 per cent. Our results agreed with that reported by Saleh and Ghandour (1983) from Jeddah (1.02 %) and Cheema *et al.* (1988) from Hasa region (0.1 and 1.22 %). The later authors agreed with our results where the infection percentage was higher in the imported breed than the indigenous one. In contrast, Hasounah and Behbehani (1976) recorded high incidence rate (39.93 %) with hydatidosis among the slaughtered animals in Kuwait.

In the present results, hydatidosis was not observed in the slaughtered cattle. Disagreed with these results, Saleh and Ghandour (1983) and Farah *et al.* (1984) reported hydatid cyst from cattle during their studies at Jeddah and Bureidah respectively. Another studies by Ghandour *et al.* (1989) also in Jeddah, where they recorded *hydatid cyst* from animals other than imported sheep.

The negative results of *hydatid cyst* in cattle during this study may be due to that cattle in Saudi Arabia are not grazing animals as sheep and goats are and it was reared indoors. Meanwhile, it was far away from infection. In other countries the incidence of hydatidosis in cattle was very high, as in Pakistan (31.05 %; Pal and Jamil, 1986) and in India (22 %; Kulkarni *et al.*, 1986).

In the present study, hydatidosis was recorded in 2.13 per cent of the examined sheep and 2.88 per cent of goats. The results agreed with that reported from Bureidah by Al-Saif *et al.* (1997), in contrast, Saleh and Ghandour (1983) in Jeddah recorded lower infection percentage (0.87 %) from the previous two hosts. Also, Ghandour *et al.* (1989) recorded high infection rate with hydatidosis (7.15 to 28 %) among the imported sheep in Jeddah. In some Arabian countries as Libya, the incidence of hydatidosis in sheep was estimated by 7.85 per cent (Gusbi *et al.*, 1987). In Morocco, Pandey *et al.*, (1986) reported the infection was 0.7 per cent (ranged 0.4-38.5 %), while in goats it was 1.4 per cent (ranged 0.2-7.7 %).

Table 2: Incidence and infection percentage of different species of metacestodes among slaughtered ruminants at Al-Qasim region.

		Camel	Sheep	Goats	Cattle	Total
<i>Hydatid cyst</i>	+ve No.	7	65	9	0	81
	%	0.25	2.13	2.88	0	1.27
<i>C. tenuicollis</i>	+ve No.	0	64	15	1	80
	%	0	2.10	4.80	0.38	1.25
Calcified cyst	+ve No.	157	317	66	5	545
	%	5.72	10.41	21.15	1.93	8.57
<i>C. bovis</i>	+ve No.	2	0	0	2	4
	%	0.07	0	0	0.77	0.13
<i>C. ovis</i>	+ve No.	0	8	2	0	10
	%	0	0.26	0.64	0	0.29

It has been found that 0.25 per cent of the examined camels at Bureidah were positive for hydatidosis, while it was recorded 3.5 per cent in camels that examined at Jeddah abattoir earlier (Saleh and Ghandour, 1983). The present results agreed with the data recorded by Cheema *et al.* (1988) in Al-Hasa region where the incidence on camels and other animals ranged from 1 to 1.22 per cent. In contrast to the previous results, 80 per cent of camels in Morocco were positive for hydatidosis (Pandey *et al.*, 1989).

In the present results the incidence of *C. tenuicollis* ranged from (0 to 4.80 %) among the slaughtered ruminants with a mean 1.25 per cent. The obtained results agreed with that recorded by Ghandour *et al.* (1989) in Jeddah abattoir where they recorded the incidence among the imported sheep ranged from 0.21 to 1.62 per cent and the other animals were free from infection. In Ethiopia, 37.1 per cent of sheep was found infected with *C. tenuicollis* (Bekele *et al.*, 1988).

The incidence of calcified cyst ranged from (1.93 to 21.15 %) with a mean of 8.57 per cent. In fact, there was no recorded about this problem from the kingdom in the available literature. The calcified cysts that collected from the infected ruminants were difficult to identify because they were degenerated and calcificated, but they might be *C. tenuicollis* which failed to reach the liver surface and undergo degeneration and calcification (Garcey and Collins, 1992). Sometimes the larval stage of *Taenia multiceps* fails to reach the brain tissue and undergo degeneration and calcification in other organs. In Libya, Gubsi *et al.* (1987) reported 7.96 per cent of the positive cases of sheep infected with hydatid cysts which were calcified and sterile.

In the present study both *C. bovis* and *C. ovis* were recorded from the slaughtered ruminants with low infection rate (0.13 and 0.29 %, respectively). The

parasites were collected only from the heart muscles in calcified form and they were identified only through their predilection seats (heart and tongue muscle). These results agreed with that recorded from Belfast (N. Ireland) where the incidence of *C. bovis* among cattle in 1989 was 0.4 per cent (Garcey and Collins, 1992). Also, similar results were obtained from sheep slaughtered at USA (1989) and UK (1960) where the incidence of *C. ovis* was 0.007 per cent and 0.2 per cent, respectively (Gracey and Collins, 1992).

The incidence of metacestodes in Al-Qassim region is related to other countries could be due to the unsuitable environmental conditions for the cestodes eggs, where the weather was hot and dry most of the year. In addition to the strict hygienic measures that applied in the abattoir reduced the infection of dogs.

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