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Prevalence of Hydatidosis in Slaughtered Animals in Thrace, Turkey

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SUMMARY: In this study, 640 cattle and 742 sheep slaughtered at twelve abattoirs in Thrace were investigated for hydatid cysts. The infection rate of hydatidosis was 11.6%.in cattle and 3.50% in sheep. The cysts were found in 3.15% of 127 calves (<1 year old), in 13.6% of 513 cattle (between 1-10 years old), in 2.64% of 720 lambs (<1 year old) and in 31.8% of 22 sheep (between 1-6 years old). The infection rate was 23.6% in female cattle and 2.95% in male cattle while the rate was 4.50% in female sheep and 1.82% in male sheep. Out of the infected cattle, 79.7% had cysts in the lungs and 64.9%, in the liver. In infected sheep, cysts were encountered in the livers of 96.2%, in the lungs of 26.9%, and in the spleen of 3.85%. Out of infected cattle, 4.05% had fertile cysts and 23.1% of infected sheep had fertile cysts.

Key Words: Cystic echinococcosis, hydatid cysts, prevalence, sheep, cattle, Turkey

Trakya'da Kasaplık Hayvanlarda Hidatidozun Yaygınlığı

ÖZET : Bu çalışmada Trakya'da 12 mezbahada kesilen 640 sığır ve 742 koyun hidatik kist yönünden incelenmiştir. Hidatidosis'in sığırlardaki enfeksiyon oranı %11,6, koyunlardaki enfeksiyon oranı %3,50 idi. Kistler; 127 buzağı/danadan (1 yaşından küçük) %3,15'inde, 513 sığırın (1-10 yaşlarında) %13,6'sında, 720 kuzudan (1 yaşından küçük) %2,64'ünde ve 22 koyunun (1-6 yaşlarında) %31,8'inde bulundu. Enfeksiyon oranı dişi sığırlarda %23,6, erkek sığırlarda %2,95, dişi koyunlarda %4,50 ve erkek koyunlarda %1,82 idi. Enfekte sığırlardan %79,7'sinin akciğerlerinde, %64,9'unun karaciğerinde kist var iken enfekte koyunların %96,2'sinin karaciğerinde, %26,9'unun akciğerinde ve %3,85'inin dalağında kiste rastlandı.Enfekte sığırların %4,05'ininde, enfekte koyunların ise %23,1'inde fertil kistlere rastlandı.

Anahtar Sözcükler: Kistik ekinokokoz, Hidatik kist, yaygınlık, koyun, sığır, Türkiye.

INTRODUCTION

Hydatidosis is still a problem of zoonotic importance in the world. Table-1 and Table-2 show the prevalence of hydatidosis in slaughtered animals in Turkey and in the other countries respectively. There are some studies reporting the prevalence of hydatidosis at various suburbs of Turkey but no studies have yet been carried out on this subject in Thrace region (European part of Turkey) except only slaughterhouse records (23) based on the hydatidosis in cattle and sheep.

MATERIALS AND METHODS

This study was carried out between March 1997 and April 1998 at various slaughterhouses in the different localities (Hadımköy, Tekirdağ, Lüleburgaz, Çorlu, Kırklareli, Keşan, Edirne, Babaeski, Saray, Çerkezköy, Malkara, İstanbul University Faculty of Veterinary Medicine) of Thrace. A total of 640 (267 female, 373 male) cattle aged between 4 months and 10 years and a total of 742 (467 female, 275 male) sheep aged between 2 months and 6 years were examined for the presence of hydatid cysts. The cysts were taken and their viability was determined in the laboratory based on the protoscoleces activity.

RESULTS

In this research, it was found that a total of 74 (11.6%) of the 640 slaughtered cattle and a total of 26 (3.50%) of the 742 slaughtered sheep were infected with the hydatid cysts in Thrace region. The infection rates in both cattle and sheep are given in Tables 3-5. As shown Table-3, the infection rate was increased by the age in both cattle and sheep.

The number of infected and bearing fertile cysts animals, infection and fertility ratios, the classification of the animals based on origin, age, infected organs are given in Table-4. As seen in this table, hydatid cysts were present in the livers and lungs of most of sheep and the spleen of in only 1, while they were present in the lungs and livers of various cattle.

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Table 1. Prevalence of hydatidosis in slaughtered animals in Turkey (after the year of 1980)

City/Country (Ref.)	Infection Rate (%)
Van /Turkey (29) (Toparlak and Gül,1989)	19.4% in 180 cattle 32.9% in 1056 sheep
Ankara/Turkey (31) (Zeybek and Tokay, 1990)	31.8% in 1412 cattle 42.4% in 506 sheep
Samsun /Turkey (8) (Celep et al., 1990)	21.1% in 142 cattle
Sivas /Turkey (22) (Özçelik and Saygı, 1990)	39.7% in 388 cattle 58.6% in 1181 sheep
Edirne /Turkey (23) (Özkan, 1991)	3.33% in Edirne, 4.68% in Tekirdağ, 7.88% in Kırklareli in cattle 1.83% in Edirne, 5.58% in Tekirdağ, 1.06% in Kırklareli in sheep:
Konya /Turkey (13) (Dik et al., 1991)	9.39% in 841 cattle 57.11% in 9785 sheep
Konya /Turkey (14) (Dik et al., 1992)	11.2% in 2161 cattle 51.98% in 13049 sheep
Kars /Turkey (30) (Umur and Aslantaş 1993)	24.65% in 5813 cattle 48.35% in 2742 sheep
Manisa /Turkey (10) (Çenet and Taşçı, 1994)	8.96% in 52736 cattle %15.98% in 62334 sheep

Table 2. Prevalence of hydatidosis in slaughtered animals in the various countries (after the year of 1980)

City/Country (Ref.)	Infection Rate (%)
Pakistan (28) (Riaz and Khalid, 1986)	Total: 5.3% in 1151 sheep 5.21% in 1055 (female) 6.25% in 96 (male) 31.05% in 1140 cattle (all of them are male)
Ethiopia (5) (Bekele et al., 1988)	Total: 16.4% in 560 sheep 17.2% in 523 adult sheep, 5.4% in 37 young sheep 17.4% in 494 (female), 9.1% in 66 (male)
Poland (20) (Lis, 1988)	41-45% in 3 millions adult cattle 30.61% in 124000 young cattle
Calcuta (India) (6) (Biswas et al., 1989)	31.9% in 379 cattle 10.7% in 4724 sheep
Jordan (1) (Abdel-Hafez and Al-Yaman, 1989)	71.1% in 380 adult sheep (cysts are in the liver and lung) %7.6% in 380 adult sheep (cysts are in the spleen)
İtaly (7) (Bortoletti et al., 1990)	91.3% in 767 adult sheep
Pakistan (19) (Khan et al., 1990)	38.9% in 210 cattle
Azerbaijan (9) (Chobanov et al., 1991)	38-41% in 4736 cattle 63-67% in 17726 sheep
India (12) (Dhote et al., 1992)	12.4% in 1133 cattle (male)
Jordan (2) (Abo-Shehada, 1993)	0.4% in sheep (age is <2) 2-4 age: 46.3% 5-6 age:78.8% 7-8 age: 84.8%
India (27) (Reddy et al., 1993)	Total: 1.74% in 172 cattle 2.1% in 95 (male), 1.29% in 77 (female) 4.74% in 1758 sheep
Ethiopia (21) (Mersie, 1993)	20.5% in 171 cattle
Pakistan (4) (Anwar et al., 1993)	Total: 3.04% in 8573 sheep 1.57% in 4531 (male) 4.95% in 3473 (female)
China (3) (Andersen et al., 1993)	88.6% in 1593 sheep
India (17) (Hafeez et al., 1994)	6.37% in 580 cattle 7.05% in 3203 sheep
Greece (18) (Himonas et al., 1994)	56.6% in 106 cattle 100% in 200 sheep

Table 5 shows the species, age and number of infected and fertile cyst bearing animals and the infection and fertility ratios, regardless of the infection status of the remaining organs.

Totally 499 hydatid cysts (310 cysts from the lungs and 199 cysts from the livers) were obtained from the 74 cattle. Out of the cysts, 38.3% were determined to be degenerated, 1.60% of them were multicystic and 0.60% of them were fertile.

From the 26 sheep, a total of 114 hydatid cysts (26 cysts from the lungs, 75 cysts from the livers and 13 cysts from a spleen) were obtained. It was found that 39.4% of the total cysts were degenerated and 42.1% were fertile.

In this study, 3 cattle and 6 sheep were infected with the cysts having viable protoscoleces. The ratio of viability of protoscoleces in fertile cysts was between 68.35%-97.25% in the livers of the cattle, between 46.67%-85.71% in the livers of the sheep, between 43.31%-88.33% in the lungs of sheep and between 53.16%-86.99% in the spleen of a sheep.

DISCUSSION

In previous studies (8, 10, 13, 14, 16, 22, 24, 25, 29-31) in other parts of Turkey, the prevalence of hydatidosis was found to be between 8.96% and 39.7% in cattle and between 15.98% and 58.6% in sheep. In another study (23) in Trace the rate was between 3.33% and 7.88% in cattle and between 1.06% and 5.58% in sheep. In the present study conducted in Trace,

Table 3. The numbers of animals which were infected and having fertile cyst and the distribution of the ratios of infection and fertility based on age and sex

		FEMALE					MALE					TOTAL				
	Age(Yrs)	NEA	NİA	ER%	NFA	FR%	NEA	NİA	ER%	NFA	FR%	NEA	NİA	ER%	NFA	FR%
C	0 -<1	50	3	6	0	-	77	1	1.29	0	-	127	4	3.15	0	-
a	1 -10	217	60	27.6	3	5	296	10	3.38	0	-	513	70	13.6	3	4.29
t	TOT	267	63	23.6	3	4.76	373	11	2.95	0	-	640	74	11.6	3	4.05
S	0 -<1	450	14	3.11	0	-	270	5	1.85	1	20	720	19	2.64	1	5.26
h	1 - 6	17	7	41.2	5	71.4	5	0	-	-	-	22	7	31.8	5	71.4
e	TOT	467	21	4.50	5	23.8	275	5	1.82	1	20	742	26	3.50	6	23.1

NEA: Number of examined animals**, NİA:** Number of infected animals, **ER%:** The rate of the infected animals in the examined ones, **NFA:** Number of animals infected by fertile cyst, **FR%:** The rate of the animals infected by fertile cyst in the infected ones, **TOT:** Total **Cat:** Cattle **She:** Sheep

Table 4. The distribution of animals which were infected and having fertile cyst based on age and infected organ

			LUNGS + LİVER				LUNGS				LİVER				LUNGS + LİVER + SPLEEN				TOTAL			
	Age (Yr)	NEA	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%
C	0 -<1	127	1	0.79	0	-	1	0.79	0	-	2	1.57	0	-	0	-	-	-	4	3.15	0	-
a	1 -10	513	32	6.24	1	3.13	25	4.87	0	-	13	2.53	2	15.4	0	-	-	-	70	13.6	3	4.29
t	TOT	640	33	5.16	1	3.03	26	4.06	0	-	15	2.34	2	13.3	0	-	-	-	74	11.6	3	4.05
S	0 -<1	720	2	0.28	0	-	0	-	-	-	17	2.36	1	5.88	0	-	-	-	19	2.64	1	5.26
h	1 –6	22	3	13.6	1	33.3	1	4.55	1	100	2	9.09	2	100	1	4.55	1	100	7	31.8	5	71.4
e	TOT	742	5	0.67	1	20	1	0.13	1	100	19	2.56	3	15.8	1	0.13	1	100	26	3.50	6	23.1

NEA: Number of examined animals**, NİA:** Number of infected animals, **ER%:** The rate of the infected animals in the examined ones, **NFA:** Number of animals infected by fertile cyst, **FR%:** The rate of the animals infected by fertile cyst in the infected ones, **TOT:** Total **Cat:** Cattle **She:** Sheep

Table 5. The distribution of animals which were infected and having fertile cyst based on age and every infected organ

			LUNGS				LIVER				SPLEEN				TOTAL			
	Age (Year	NEA	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%	NİA	ER%	NFA	FR%
C	0 -<1	127	2	1.57	0	-	3	2.36	0	-	0	-	-	-	4	3.15	0	-
a	1 –10	513	57	11.1	0	-	45	8.77	3	6.67	0	-	-	-	70	13.6	3	4.29
t	TOT	640	59	9.22	0	-	48	7.5	3	6.25	0	-	-	-	74	11.6	3	4.05
S	0 -<1	720	2	0.28	0	-	19	2.64	1	5.26	0	-	-	-	19	2.64	1	5.26
h	1 - 6	22	5	22.7	2	40	6	27.3	4	66.7	1	4.55	1	100	7	31.8	5	71.4
e	TOT	742	7	0.94	2	28.6	25	3.37	5	20	1	0.13	1	100	26	3.50	6	23.1

NEA: Number of examined animals**, NİA:** Number of infected animals, **ER%:** The rate of the infected animals in the examined ones, **NFA:** Number of animals infected by fertile cyst, **FR%:** The rate of the animals infected by fertile cyst in the infected ones, **TOT:** Total **Cat:** Cattle **She:** Sheep

the prevalence was found to be 11.6% in cattle and 3.50% in sheep. The lower rate (3,50%) in sheep is attributed the most (97%) of animals to be young (<1 year old).

It's known that the infection rate is much higher in adults than the young animals both cattle (15, 20, 26, 31) and sheep (1, 2, 4, 5, 7, 31). In the present study, the infection rate is 3.15% in calves and 2.64% in lambs while the rate is 13.6% in adult cattle and 31.8% in adult sheep.

As a conclusion, the prevalence of hydatidosis in slaughter animals in Thrace is comparatively lower than the other parts of Turkey. This may be explained by hygienic status, environmental condition, breeding system and the age of examined animals.

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