

**Short communication****Oesophageal spirocercosis in stray dogs of Urmia**Matin Gholi-Toluei¹, Amir Amniattalab^{2*} and Sohrab Rasouli³¹Veterinary Faculty, Urmia branch, Islamic Azad University, Urmia, Iran²Department of Veterinary Pathology, Urmia branch, Islamic Azad University, Urmia, Iran³Department of Veterinary Parasitology, Urmia branch, Islamic Azad University, Urmia, Iran

Article history

Received: 15 Sep, 2015

Revised: 5 Oct, 2015

Accepted: 3 Nov, 2015

Abstract

In this research 32 dogs were studied for oesophageal spirocercosis. Microscopic and macroscopic examinations revealed that 8 dogs (25%) were infected with spirocercosis. Oesophageal granulomas in infected animals vary from 3mm to 4cm in size and a total of 28 *S. lupi* granulomas were recorded in infected dogs. Most of these granulomas were found in distal part of oesophagus. There were no signs of neoplastic changes and aortic aneurism among infected dogs. Microscopic examinations of central part of parasitic granuloma showed presence of parts of nematodes surrounded by neutrophils. The results of study showed that prevalence was significantly more in male dogs than the female dogs ($P < 0.05$). However, the incidence had no significant variation with age and season ($P > 0.05$).

Keywords: Dog; spirocercosis; pathology; oesophagus

To cite this article: Gholi-Toluei M, A Amniattalab and S Rasouli, 2015. Oesophageal spirocercosis in stray dogs of Urmia. Res. Opin. Anim. Vet. Sci., 5(9): 388-391.

Introduction

Spirocerca lupi is a nematode pathogen which has a known relationship with the dog in the tropical and subtropical areas. Due to a prolonged period of subclinical infection, most cases are not recognized until the disease is advanced stages (Mazaki-Tovi et al., 2002). Spirocercosis shows extended clinical symptoms such as vomiting, regurgitation, cough, weakness, lethargy and weight loss. Death from *Spirocerca lupi* infection may be caused by malignant neoplasms or due to aortic aneurysms (Ranen et al., 2004; Rinas et al., 2009).

Aberrant migration of the larvae is less common but parasitic granulomas can be found in various organs such as the stomach and intestines, lumbar fascia, lung, thymus, trachea, diaphragm, heart, kidney, subcutaneous tissue and bladder (Devir et al., 2008; Chikweto et al., 2012).

According to previous reports prevalence of this infection ranges from 10 to 85%. The results of autopsy

of stray dogs showed a prevalence of 40% in Bangladesh, 23.5% in India, 19% in Iran and 13% in South Africa (Minnar et al., 2002). However, in Kenya, 85% of stray dogs and 38% of pet dogs were found infected. In a study conducted in Greece, the prevalence of *S. lupi* was reported 10% in pet dogs (Mylonakis et al., 2001). In North America, spirocercosis was reported 8.8% among pet dogs and 14.2% in stray dogs (Chikweto et al., 2012). Besides, there was no significant difference in prevalence of spirocercosis between the sexes (Chikweto et al., 2012).

The present study was conducted on stray dogs subjected to necropsy at specialized veterinary clinic of Islamic Azad University, Urmia branch to find the prevalence of spirocercosis in oesophagus.

Materials and Methods

This study was conducted during 2011 to 2014 on 25 stray dogs captured around Islamic Azad University,

***Corresponding author:** Amir Amniattalab, Department of Veterinary Pathology, Urmia branch, Islamic Azad University, Urmia, Iran; E-mail: a.amniattalab@iaurmia.ac.ir

Urmia branch and 7 stray dogs died in vehicular accidents. Among 32 dogs, 23 were male and 9 females which were classified into under one year old group (6 dogs) and older than one year group (26 dogs). The dogs were euthanized with acepromazine (0.03ml/kg) intramuscularly and thiopental sodium (75mg/kg) by intravenous injection.

The animals that had died in accidents were taken to necropsy directly. The necropsy examination was conducted in standard manner and the parasites collected from oesophagus were transferred into vials containing 70% ethyl alcohol and sent to Parasitology Laboratory for the identification of nematode. Tissues from granulomatous lesions were kept in 10% buffered formalin and transferred to Pathology Laboratory for histopathological examination.

Tissue samples were fixed in 10% buffered formalin for 2-3 days and then processed by routine procedures paraffin embedding, sectioning and staining with hematoxylin and eosin (H&E) staining method.

Statistical analysis

Mann-Whitney test and Chi-square were used to conduct the statistical differences using SPSS 18 (Version 18, Chicago, IL, USA) software. P value less than 0.05 was statistically considered significant.

Results

Out of 32 dogs, 8 suffered from oesophagus spirocercosis. Granuloma caused by *Spirocerca lupi* nematode in infected dogs ranged from 3mm to 4cm (Fig. 1). Additionally, higher number of neutrophils were observed in the infected sections (Fig. 2&3). From the 8 infected dogs, 28 oesophageal parasitic granuloma were found and 122 parasites were recovered from 23 granuloma. In addition, out of 122 parasites, 101 male and 21 female parasites were identified. The lesions were significantly high in male compared to female dogs. Age and sex had no significant effect on the prevalence of the parasite.

Discussion

The results of the present study revealed that prevalence of canine spirocercosis pyogranuloma was

significantly high in males than female dogs. The rate of infection of spirocercosis in necropsied dogs was 25%. The results of the present study confirmed the findings of another study conducted in Shiraz showing that among 105 necropsied dogs, 20 dogs (19.04%) were positive for *Spirocerca lupi*. The rate of infection was significantly higher in dogs older than one year (23.5%) and in western areas of the city (36.6%) it was higher than other areas of the city (Oryan et al., 2008). Urmia city has a high occurrence of spirocercosis among dogs which could be due to warm and dry weather in Urmia. The results did not show any significant difference in terms of *Spirocerca lupi* infection between older and younger dogs, though dogs less than one year of age have a lower risk of infection (Mackenzie et al., 1995). It seems that due to a long cycle of *S. lupi* life, oesophageal parasitic granulomas usually cannot be seen in dogs less than one year. In a study conducted in Bangladesh on stray dogs, a significantly greater number of cases of infected dogs were observed in the summer (50%) compared to the winter (31%) (Das et al., 2011), however, no such difference could be recorded in the present study. Great differences in climatic temperature and rainfall in different seasons could be responsible for great season variation in Bangladesh.

In the present study the number and size of granulomas, there was no significant difference between male and female ($P>0.05$). In a study conducted in Bangladesh on stray dogs, the number of spirocercosis ranged from 1-3 in the oesophageal wall during the autopsy and the mean size was 2.104 ± 0.139 cm recorded (Das, et al., 2011). Apparent pathological observations were similar to other researcher's results (Ramachandran et al., 1984). In the present study, the size of granulomas (nodules) varied from less than 1 cm to 4 cm, and the number of worms in granulomas varied from 1 to 31 worms. In addition, most of granulomas were observed in dogs-distal oesophagus. Some studies have been done on the use of anti-parasitic drugs which are effective for treatment and prevention of oesophageal spirocercosis. Treatment with doramectin at the rate of 500 micrograms per kg per day for 6 weeks resulted in disappearance of *Spirocerca lupi* granulomas in oesophagus of 7 dogs (Berry, 2008). Although most of *S. lupi* infections are subclinical,

Table 1: Different variables affecting the prevalence of spirocercosis in necropsied dogs

Variables	Sample examined	Positive cases	Diameter (mm)	Granuloma	P value
Age	year>1	26	6 (18.7%)	3 – 40	3.71±0.680
	year<1	4	2 (6.2%)	5 – 35	2.0±0.000
Sex	Male	23	7 (21.8%)	3 – 40	4.07±0.595
	Female	9	1 (3.1%)	10	1.53±0.070
Season	Spring	12	5 (15.6%)	5 – 40	2.35±0.650
	Summer	1	0 (0.0%)	-	0.197±3.220*
	Fall	10	2 (6.2%)	5 – 35	4.023±0.662
	Winter	8	1 (3.1%)	3 – 24	1.883±0.030

* Fisher's exact test (P=0.889)

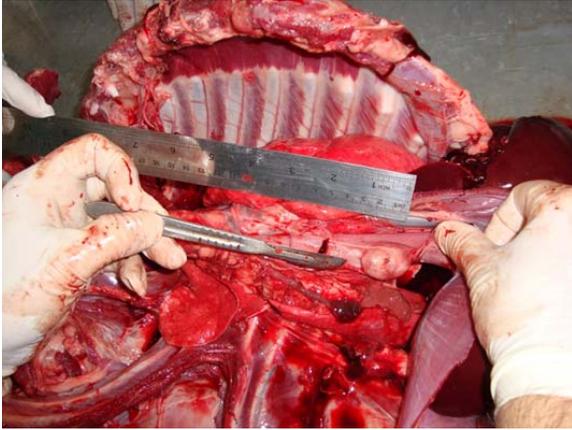


Fig. 1: Macroscopic appearance of oesophageal spirocercosis in necropsied dogs affected by *Spirocerca lupi*; granulomas caused by *Spirocerca lupi* are seen in dogs' oesophagus walls which is about 2.5 cm in diameter.



Fig. 2: Pathologic section showing spirocercosis pyogranuloma with presence of parasite in the middle (arrowhead) surrounded by tissues with a large number of neutrophils (asterisk) (H&E; X40)

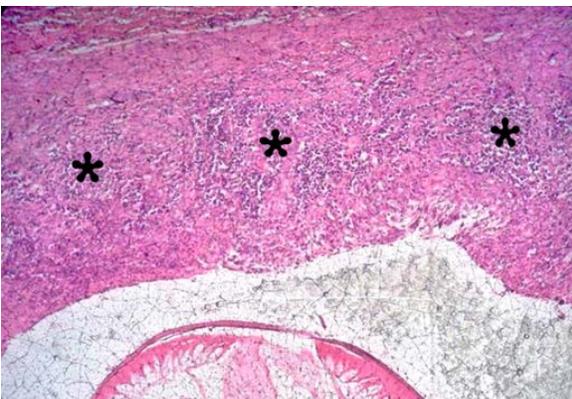


Fig. 3: Higher magnification of the figure 2 showing neutrophil accumulation (asterisk) (H&E; X100)

sometimes granuloma of the oesophagus, sarcoma of aortic aneurysm, thoracic, cervical spondylosis, hypertrophic osteopathy and salivary glands necrosis have been reported (Fox et al., 1988; Schroeder and Berry, 1998). In the present study, however, only oesophageal granulomas were recorded.

Conclusion

Twenty five percent prevalence of oesophagus spirocercosis among stray dogs is quite alarming and needs attention of the authorities in Urmia city to adopt preventive measures for the control of the disease.

References

- Berry WL (2008) *Spirocerca lupi* oesophageal granulomas in 7 dogs: resolution after treatment with doramectin. J Vet Intern Med 14: 609-612.
- Chikweto A, Bhaiyat MI, Tiwari KP, De Allie C, Sharma RN (2012) Spirocercosis in owned and stray dogs in Grenada. Vet Parasitol 190: 613-616.
- Das S, Abdul Alim MD, Hassan MM, Sikder S, Muraduzzaman M, Masuduzzaman D (2011) Spirocercosis in stray dogs of Chittagong Metropolitan area of Bangladesh: an epidemiological and pathological investigation. Vet World 4: 485-491.
- Devir E, Kirberger RM, Mukorera V, Van der Merwe LL, Clift SJ (2008) Clinical differentiation between dogs with benign and malignant spirocercosis. Vet Parasitol 155: 80-88.
- Fox SM, Burns J, Hawkins J (1988) Spirocercosis in dogs. Compend Small Anim 10: 807-822.
- Mackenzie WR, Kazmierczak JJ, Davis JP (1995) An outbreak of cryptosporidiosis associated with a resort swimming pool. Epidemiol Infect 115: 545-553.
- Mazaki-Tovi M, Baneth G, Aroch I, Harrus S, Kass PH, Ben-Ari T, Zur G, Aizenberg I, Bark H, Lavy E (2002) Canine spirocercosis: clinical, diagnostic, pathologic and epidemiologic characteristics. Vet Parasitol 107: 235-250.
- Minnaar WN, Kreck RC, Fourie LJ (2002) Helminthes of dogs from a peri-urban resource-limited community in Free State Province, South Africa. Vet Parasitol 107: 343-349.
- Mylonakis ME, Rallis T, Koutinas AF, Leontides LS, Patsikas M, Florou M, Papadopoulos E, Fytianou A (2006) Clinical signs and clinicopathologic abnormalities in dogs with clinical spirocercosis: 39 cases (1996-2004). J Am Vet Med Assoc 228: 1063-1067.
- Oryan A, Sadjjadi SM, Mehrabani D, Kargar M (2008) Spirocercosis and its complications in stray dogs in Shiraz, southern Iran. Vet Med Czech 11: 617-624.

- Ramachandran PV, Shakir SA, Ramakrishnan R (1984) Spirocercosis in canines – a necropsy survey. Cheiron Tamilnadu J Vet Anim Sci 13:132-135.
- Ranen E, Dank G, Lavy E, Perl S, Lahav D, Orgad U (2004) Oesophageal sarcomas in dogs: Histological and clinical evaluation. Vet J 178: 78-84.
- Rinas MA, Nesnek R, Kinsella JM, DeMatteo KE (2009) Fatal aortic aneurysm and rupture in a neo tropical bush dog (*Speothos venaticus*) caused by *Spirocerca lupi*. Vet Parasitol 164: 347-349.
- Schroeder H, Berry WL (1998) Salivary gland necrosis in dogs: a retrospective study of 19 cases. J Small Anim Pract 39: 121-125.