

Spirocercosis in Dogs in the Wider Area of Belgrade

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Abstract

Spirocercosis is a parasitic disease caused by the nematode *Spirocerca lupi*, which has often fatal outcome in dogs. The disease is rarely diagnosed due to nonspecific clinical signs and the lack of awareness of the presence of the agent among practitioners. The first case of spirocercosis in dogs in Serbia was recorded in Belgrade in 2014 and in the later period until 2019, eighteen more cases in the wider area of Belgrade were discovered.

Introduction

Spirocercosis is a parasitic disease of canids caused by the nematode *Spirocerca lupi*. The disease is widespread worldwide but is most common in warm climates. It is most prevalent in Africa, especially in South Africa, and a large number of cases have been reported in the southern states of the USA. In Europe, the disease is present in Mediterranean countries, mostly in Greece, Italy and Iberian Peninsula. In recent decades, it has been established in northern Europe too. The parasite has an indirect life cycle. Domestic and wild canids serve as the definitive hosts and beside them intermediate hosts (coprophagous beetles - Scarabidae) and paratenic hosts (amphibians, reptiles, birds, and small mammals) are also included. Dogs get infected by ingestion of intermediate or paratenic hosts which carry infective larvae (L3). Clinical symptoms of spirocercosis occur in animals older than six months and are most often the result of the presence of adult parasites in the esophagus or aneurysms of blood vessels. Affected dogs vomit and have difficulty in swallowing, increased salivation, dysphagia, dyspnoea, become melancholic and lose their weight. Stool changes are less common. In a small number of cases spondylosis occurs. In Serbia, spirocercosis was recorded for the first time in foxes in 1989 and after that in 2014 in dogs.

Material and Methods

In a period 2014-2019, dogs suspected for tumors and chronic gastric disorders were examined by radiography and in cases when tumorous lesions suspected to be indicative of spirocercosis occurred, stool samples were subjected for coprological examination. The eggs of the parasite were determined by its morphological characteristics. Infected dogs were examined by esophagoscopy. One infected dog that died was necropsied and examined grossly. In majority of cases owners did not approve necropsy.

Results and Discussion

In a period from 2014-2019, eighteen cases of spirocercosis in dogs in the wider area of Belgrade were identified. All infected dogs had malignancies, most often osteosarcomas and fibrosarcomas, for which they were brought to the veterinarian. In addition to tumors, we observed the majority of signs described in literature. Increased salivation and difficulty in swallowing were found in two dogs and vomiting in one. Weight loss was manifested in all infected dogs, which was attributed to tumors. Coughing and shortness of breath

were observed in one dog. Digestive disorders with nodules in the stomach (visualized by gastroscopy) and spondylosis were manifested in one dog. This syndrome, also known as "acute intervertebral disc", is typical during the migration of parasites from the aorta through the connective tissue into the thoracic part of the esophagus, the primary site of parasitism. During the endoscopic examination of the esophagus, characteristic nodular formations with parasites in them were found in seven dogs.

The necropsy of one dog (the miniature schnauzer) found alterations in the thoracic and iliac arteries in a form of hemorrhagic lesions and thickening at the site of the nodule left by the parasites. This was a consequence of the migratory phase of larvae, which after infection break through the stomach wall and come to the aorta where they form nodules. Same pathological changes in the arteries have been observed in most species of canids and felids infected with spirocerca. Primary pathological lesions were nodules in the esophagus where parasites reach full maturity. From these nodules last part of the female protrudes, and excretes the milky-white liquid in which the eggs of the parasite are formed. We found four nodules measuring 7-10 mm with one female in each. The average length of the parasites ranged from 5.6 to 8.3 mm.

During migration, the larvae damage the tissues through which they pass. A special problem is the fact that the organism's reaction to larvae leads to formation of tumors, mainly malignant connective tissue tumors whose metastases are most commonly found in the lungs and bones. The most common are osteosarcomas and fibrosarcomas. The prognosis is unfavorable and the mortality rate is up to 95%.

Conclusion

Spirocercosis is little known in our environment. The practitioners do not suspect *S. lupi* because it is one of the rare causes of tumorous alterations. As the agent can be unnoticed and its impact misdiagnosed, there is reason to assume that there are many more cases of infection in dogs than are diagnosed and reported. In the future, more attention should be paid to the diagnosis, prevention and treatment of spirocercosis in Serbia. This paper suggests that parasitological examination should be done, particularly in the presence of signs and lesions such as those described here.

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