

**DETECTION OF SPIROCERCA LUPI FROM DOGS IN YASUJ, SOUTH OF IRAN**

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**ABSTRACT**

*Spirocerca lupi* (Rudolphi 1809) is a round worm that is widely distributed, classically causing esophageal nodules, aortic aneurysms and spondylitis. Clinical signs of infection are regurgitation, vomiting, weight loss, coughing, dyspnea and, rarely, sudden death. This study reports the infection rate in dogs in Yasuj city, south of Iran.

In this study, 22 carcasses of dogs were examined for *Spirocerca* infection. All specimens were examined macroscopically for *Spirocerca* nodules. The nodules were removed from the carcass and placed in 10% formalin. In the parasitology laboratory, the nodules were opened and *Spirocerca* worms were removed and detected using a diagnostic key. Of the 22 carcasses that were studied in our study, 2 cases (9.09%) were infected with the nodule in the esophagus. Both of these nodules were examined and *Spirocerca* worms were removed from them. This infection rate is significant in dogs, and due to the lack of previous reports in this regard, we should pay attention to the life cycle of *Spirocerca* worm and the probability of human infection in the region.

**INTRODUCTION**

Spirocercosis is caused by the worm *Spirocerca lupi* (1). Some countries like as South Africa (2), Israel (3, 4) and Greece (5), have reported the highest levels of infection in dogs.

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The dogs are infected via ingestion of coprophagic beetles, or their avian or small reptile predators. The migration of larvae may cause hemorrhages, endarteritis, aortal stenosis, aneurysm or aortal rupture, which result in vomiting, in appetite or even sudden death due to damage to the aorta. Final site of adult worms creates connective tissue nodules, most commonly in the esophagus but occasionally in the wall of the stomach as well. These nodules may cause signs of retching, vomiting, regurgitation, weight loss and aspiration. Due to larval migration, nodules or granulomas can form in other locations (thoracic organs, intestinal tract, urinary organs, connective tissue of the skin) (6, 7, 8).

In some cases, sarcoma developed from the granulomas (9, 10). Schroeder and Berry reported salivary gland necrosis in association with *S. lupi* infection (11).

One of the best diagnostic ways is esophagoscopy because that provides an opportunity to identify the typical nodules caused by the parasite, whereas a differentiation between granulomas and sarcoma can be achieved by histopathologic evaluation of biopsy samples (12). Another method for diagnosing is dog stool test (3). Treatment with Diethyl-carbamazine reduces clinical signs and egg shedding, although it is not effective against adult worms (8). Ivermectin can be used to treat spirocercosis according to several publications, although recommendations regarding the dose and time of treatment vary between authors. Ivermectin injections (600 µg/kg s.c. twice per week) combined with oral prednisone (0.25 mg/kg q 12, then lowering the dose every two weeks) cause regression of nodules in 5 out of 8 naturally infected dogs (13). Although the esophageal granulomas caused by *Spirocerca lupi* can be successfully treated with doramectin, sarcomas require surgical and oncological treatment (12).

Yasuj city is located in south of Iran. In this area people have a rural and nomadic life style. For this reason, the use of dogs is very common in people's lives. In addition to owner ship dogs, stray dogs are also very numerous in this area. Dog feeding is also not controlled. As a result, various types of parasitic infections are seen in dogs. There was no information on *Spirocerca* infection in this area, in this study, we examined the contamination of dogs with *Spirocerca lupi* worms.

## MATERIALS AND METHODS

To carry out this study, it was necessary to coordinate with Yasuj health center. The relevant authorities provided our research team with the carcasses of stray dogs. The carcasses were immediately assembled and the esophagus and gastric region were carefully examined by the veterinarian for the presence of the nodule. The existing nodules, along with some of the

lateral tissue, were removed using bistouri and placed in 10% formalin. Then, in the parasitology laboratory, the nodules were carefully opened and the contents inside them were depleted. The delicate nematodes found in the nodule slowly and completely exited. These nematodes were stained with carmen acid color and after fixation on the slide and using the diagnostic key, the nematodes were detected as *Spirocerca lupi*.

## RESULTS

Of the 22 carcasses examined in this study, 2 cases of *Spirocerca lupi* were detected. Therefore, the infection rate in these dogs is 9.09%. Both infected male dogs were aged between 5 and 10 years old. These dogs were also infected with other infections such as *Taenia hydatigena* and *Echinococcus granulosus*.

## DISCUSSION

Two previous studies in Iran have been published on *Spirocerca lupi* in pubmed. Sasani reported in his study, from 1998 to 2012, 42 dogs with spirocercosis referred to pathology Department of Veterinary Faculty, Tehran University. Frequency of spirocercosis was higher in October, November, December, January, February, March months. Averagely, the cases were 4.73 years old of age, so that 59.3 % of them were male (14).

In other study Gholami detected *Spirocerca lupi* in 6% of 50 stray dogs in his study in north of Iran (15).

Based on our study the prevalence of *Spirocerca lupi* infection was 9.09% which is more prevalent than the Gholami study. However, this is the first report of infection with the worm in the study area. In general, there are few studies in Iran regarding this worm. Because of this, it is very important for rare diseases. But in other countries, there are many studies on this subject. In the previous study in Israel, spirocercosis was present in greater numbers in urban dogs (3). However, this difference between urban and rural environments could not be detected in later research (4). In South Africa and Kenya, the disease was more prevalent in the countryside, mainly in stray dogs (16, 17, 18). Literature data suggest the distribution of immediate and paratenic hosts as the biggest factor affecting the occurrence of the disease (2). The results highlight the potential role of stray dogs for transmission of the helminthic parasite that is a significant risk to human health.

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## Conflict of interest

The authors declare that they have no conflicts of interest.

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