

DETECTION OF LEISHMANIASIS DISEASE IN STRAY DOGS IN THE TETOVO REGION AND BREEDS WITH HIGHER SUSCEPTIBILITY

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ABSTRACT

Leishmaniasis is a deadly disease, in addition to dogs with owners, recently it has also been detected in stray dogs in the region of Tetovo in different breeds. It is mosquitoes of the genus *Phlebotomus* that transmit the disease to dogs and humans. This *Phlebotomus* is active from March to October. Mainly stray dogs are not protected from these insects by not being treated by these ectoparasites, not wearing anti-parasite belts, and not being treated by ectoparasites, to keep these parasites away. In the last 5 years in the Republic of North Macedonia, tests and treatments have been carried out for the detection of leishmaniasis and the treatment of stray dogs. Leishmaniasis is detected more in pure pedigree breeds and less in mixed breeds.

Keywords: Leishmaniasis, *Phlebotomus*, Ectoparasite, Genus.

INTRODUCTION

Leishmaniasis has an incubation period of 2-3 months. The disease can appear with a series of symptoms, but it may appear also with one symptom. Most dogs are affected by skin symptoms, some may also affect parts of the organs. Classic symptoms are: Dermatitis of the skin, dandruff, weight loss, alopecia or hair loss especially around the eyes and in the soft tissues, in the paws, sores in the ears, joint pain and back pain, eye sores, etc.

In the Municipality of Tetovo in 2021, 272 stray dogs of different breeds were treated, and from the tests done (at the veterinary institute in Skopje), 27 came out positive. For the prevention of this disease, there are now also different vaccines and treatments. This disease catches dogs bitten by this infected mosquito and gives severe symptoms. It is important to note that this disease is not spread from dog to dog or from dog to human. The disease is spread by vectors.

MATERIALS AND METHODS

To detect Leishmaniasis disease in stray dogs, several diagnostic tests can be done. The first test is the test kit (rapid test), but the most accurate test is the serological test, which is used to identify antibodies against Leishmaniasis in the serum of stray dogs. In addition to the tests, identification can also be done through the clinical signs that we will mention below.

The dogs were caught in the municipality of Tetovo and the villages that gravitate to the municipality of Tetovo and those near public facilities, schools and more frequented roads and

our priority has been given to dogs with skin problems, hair loss, skin rash, and various skin wounds.

The dogs were caught by professional people, and sent to shelters, and blood samples were taken and sent to the accredited laboratory at the Veterinary Institute in Skopje for analysis of Leishmaniasis. Sample sent blood/serum. Method SOP 532 Immunofluorescent detection of Leishmaniasis Infantum antibodies.

In addition to laboratory tests, the affected dogs also had symptoms of skin rash, alopecia, weight loss, food refusal, skin dandruff, various skin lesions, and weight loss. Dogs caught in the Tetovo region that tested positive for Leishmaniasis were also with visible clinical skin signs that tested positive. From the tests done at the Veterinary Institute in Skopje, 27 out of 272 were positive.

Based on data and analysis, we found that purebred dogs are more at risk of leishmaniasis than mixed-breed dogs, and dogs with long hair, based on clinical signs, purebred dogs have also had lethargy, refusal to food and severe wounds around the ears, runny nose and other clinical signs.

Macrophages infected with *L. infantum* can be found in parasitized tissues, causing granulomatous inflammatory reactions that lead to most symptoms. Most dogs present with poor body condition or cachexia. Cutaneous signs include skin lesions (nodular, ulcerative, and pustular) and exfoliative dermatitis. Alopecia, pale mucosa, and erythematous reactions are also common. Onychogryphosis, or nail enlargement, is very common and is associated with lichenoid and interfacial mononuclear dermatitis in the absence of parasites. Ocular damage may also be found, common in symptomatic dogs, and characterized by enlarged lymph nodes as a result of hypertrophy in the nodular structure.

Renal involvement occurs in most infected dogs: glomerulonephritis is associated with immune complex deposition and may progress to renal failure. Kidney damage may begin early in the infection but is manifested only in the early stages by proteinuria and high levels of creatinine in the blood. Kidney failure is the leading cause of death in dogs. Dogs may commonly present with epistaxis, hematuria, and hemorrhagic diarrhea.

The spleen concentrates a high parasite load and, as a consequence, significant morphological changes occur, including hypertrophy and hyperplasia of the red pulp and infiltration of mononuclear and plasma cells. The white pulp of the spleen is presented, the replacement of macrophages by lymphocytes due to hypertrophy and hyperplasia of this region. The spleen is the organ where the response to the parasite is established and where the process of cell activation occurs.

L. infantum invades most tissues and organs of dogs, reaching the bone marrow which is considered the deepest organ and responsible for the continuation of the disease, including relapses. Although hematopoiesis is normal in the early stages of the disease, parasitism of the bone marrow leads to changes in the production cell, leading to pancytopenia and non-regenerative anemia, histiocytic hyperplasia, and erythrocyte hypoplasia, ending with medullary aplasia. All these changes translate into hematological and coagulation disorders that are exacerbated by changes in hemolysis.

RESULTS AND DISCUSSION

The dogs caught in the Tetovo region that tested positive for Leishmaniasis also had visible clinical signs of the skin, which also tested positive through blood samples.

From the tests done at the Institute of Veterinary Medicine in Skopje, 27 out of 272 dogs have also come out positive: 100 dogs are mixed breeds over 25 kg, 72 mixed breeds under 25 kg, 15 Kangals, 15 Asians, 30 Sharr Mountain dogs, 5 Bull Terriers, 15 Pinscher dogs, 10 Hounds and 10 Terriers, 117 males and 155 females, of which 17 males are Leishmaniasis positive and 10 females are Leishmaniasis positive. Total 27 Positive.

Tested breeds	Negative	Positive	Total
Mixed	169	3	172
Sharr Mountain dogs	19	11	30
Bull Terrier	3	2	5
Pinscher	13	2	15
Asian dog	13	2	15
Hound	7	3	10
Terrier	6	4	10
Kangal	15	0	15
Total	245	27	272

Tab. 1 Tests in Total

Breeds	Male	Female	Total
Mixed	3	0	3
Sharr Mountain dogs	7	4	11
Bull Terrier	2	0	2
Pinscher	1	1	2
Asian dog	2	0	2
Hound	1	2	3
Terrier	1	3	4
Total	17	10	27

Tab.2 Breed with higher susceptibility based on gender

Breeds	Long hair	Short hair
Mixed dogs	2	1
Sharr Mountain dogs	8	3

Bull Terrier	0	2
Pinscher	2	0
Asian dog	1	1
Hound	1	2
Terrier	3	1
Total	17	10

Tab. Breeds based on hair

Pure breeds and those with long hair are affected the most by Leishmaniasis. 3 mixed breeds over 25kg males, 11 Sharr Mountain dogs, i.e. 7 males and 4 females, 2 Bull Terrier males, 2 Pinschers one male and one female, 2 Asian males, 3 hounds (Posavac, Trabujet) one male and two females, and one male and three female Terriers.

Based on the percentages from the analyses made, it appears that:

Of the 272 tested, 27 were positive, or 9.92% of the total number of tests were positive.

The races with the highest vulnerability based on gender are males, i.e.:

17 males are affected, which in percentage is 6.25% and 10 females are affected with 3.67% females.

Long hair breeds are more vulnerable i.e.:

Of the 17 positives, 6.25% are long hairs and 10 are short hairs, 3.67%.

Mixed breeds	Negative in %	Positive in %	Total %
Mixed	62.13	1.10	63.23
Sharr Mountain dogs	6,98	4.04	11.02
Bull Terrier	1,10	0.73	1.83
Pinscher	4.77	0.73	5.51
Asian dog	4.77	0.73	5.71
Hounds	2.57	1.10	3.67
Terrier	2.20	1.47	3.67
Kangal	5.51	0	5.51
Total	90.07	9.92	100

Tab.4 Total tests in percentage

Breeds	Male in %	Female in %	Total %
Mixed	1.10	0	1.10
Sharr Mountain dogs	2.57	1.47	4.04
Bull Terrier	0.73	0	0.73
Pinscher	0.36	0.36	0.73
Asian dog	0.73	0	0.73
Hound	0.36	0.73	1.10
Terrier	0.36	1.10	1.47
Kangal	0	0	0
Total	6.25	3.67	9.92

Tab.5 Breeds with the highest susceptibility in percentage

Breeds	Long hair in %	Short hair in %	Total %
Mixed	0.73	0.36	1.10
Sharri Mountain dog	2.94	1.10	4.04
Bull Terrier	0	0.73	0.73
Pinscher	0.73	0	0.73
Asian dog	0.36	0.36	0.73
Hound	0.36	0.73	1.10
Terrier	1.10	0.36	1.47
Kangal	0	0	0
Total	6.25	3.36	9.92

Tab.6 Breeds based on hair shown in percentage

CONCLUSION

In the municipality of Tetova, the treatment of stray dogs and the detection of leishmaniasis began for the first time in 2019. From the analyses carried out, it turns out that even in our region we have a high susceptibility to leishmaniasis. It does not mean that before 2019 the Leishmaniasis disease was not present, but tests and monitoring were not done. The results show us that purebreds have higher susceptibility. Purebreds are dogs that have been with their owners, kept them for a while, and then let them out on the street. Males are more susceptible. Long-haired dogs are more predisposed to Leishmaniasis due to the construction of the body and the possibility of hiding the mosquitoes. Our data are made by the veterinary clinic in Tetovo, and signed by the municipality by public call.

We have cases of the spreading of the disease to humans as well, and the infection of the environment where these dogs move is also a potential risk.

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