Detection of Dirofilaria sp. microfilariae in the blood of dogs in Khabarovsk

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Abstract. The problem of dirofilariosis, including in the Russian Federation, is caused by the wide circulation of the pathogen in the natural environment, lack of proper measures to identify and dehelminthize infected animals of obligate definitive hosts (dogs, less frequently cats) and extermination measures against intermediate hosts of dirofilariae - Culicidae family mosquitoes Anopheles, Ochlerotatus, Aedes, Stegomyia, Culex, Culiseta and Coquillettidia genera (about 70 species of mosquitoes are capable of maintaining larval development of dirofilariae to the invasive stage). Until the middle of the last century, only a few dozen cases of dirofilariosis were diagnosed, and over the past 50 years their number has increased dramatically. In Russia, dirofilariasis is registered in the Primorsky, Khabarovsk, Krasnodar, Stavropol Territories, North Caucasian republics, Astrakhan, Volgograd, Rostov, Lipetsk and Voronezh regions.

Keywords: dirofilariasis, microfilariae, definitive hosts, mosquitoes.

Introduction

At the present stage, dirofilariasis is becoming an acute problem, since it is the only helminthiasis in temperate climates with a transmissible route of transmission. Dirofilariosis is a biogelminthiasis whose pathogen is transmitted by blood-sucking mosquitoes. In modern conditions there is a tendency to increase the number of registered cases of Dirofilariosis caused by Dirofilaria repens among the residents permanently residing in the temperate zone of Western Europe and Russia. Since the end of the 1970s, the attention of specialists from different regions of Russia to this problem has increased noticeably.

The territory of the Far East is a moderate risk zone for dirofilariasis infection. In Khabarovsk single cases were recorded, but in recent years there has been a tendency for helminthiasis to spread. Creation of irrigation canals, climate change, decrease of frog populations due to catching of frogs by Chinese citizens for eating and medicine preparation, annual burning of peat bogs and forest belts in the city outskirts lead to the shift of temperature regime; all that creates conditions for mass outbreak of Culex, Aedes, Anopheles mosquitoes and appearance of new outbreaks.

The formation of synanthropic foci and the preservation of the parasitic system of dirofilariae in the chain dog-mosquito-human and dog-mosquito-dog may be a factor in the increase in the number of dirofilariosis patients. In synanthropic foci, the extensiveness of invasion by dogs and the high number of the vector can have a considerable influence on the human infestation. It is known that in dogs dirofilariosis is caused by two pathogen species: Dirofilaria immitis and Dirofilaria repens, in people, as a rule, only Dirofilaria repens. Circulation of the pathogen in the natural environment and lack of appropriate measures to identify and deworm infected animals (dogs and cats) - obligate definitive hosts, contribute to increased transmission of dirofilariosis to humans [1].

Purpose of the study – to establish the study of the incidence of dirofilariasis among definitive hosts (dogs) in Khabarovsk city.

Blood of dogs was examined for the presence of microfilariae by the classical method: direct microscopy of a fresh drop of blood under low magnification (×10); the easiest, most convenient and fast diagnostic method (Fig. 1).

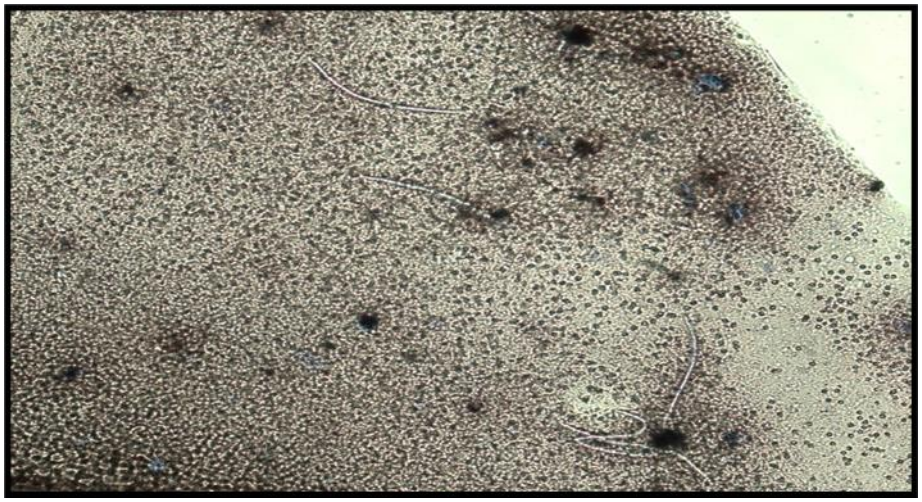

Fig. 1. Microfilariae in canine blood (Photo by Ivanova I.B.)

The research work was carried out by microscopy. A total of 659 dogs were examined by random sampling. There were 336 animals from veterinary clinics, 39 service dogs (from the kennel of the UVD, UVD on Transport, FKB IK-3 UFSIN of Russia for Khabarovsk Krai), and homeless dogs from four city districts - 284.

The results of the analysis of our studies showed a high contamination of dogs with dirofilarias in Khabarovsk city. Of the 659 dogs examined, 193 (29.3±1.7%) had microfilariae detected in their blood (Fig. 2).

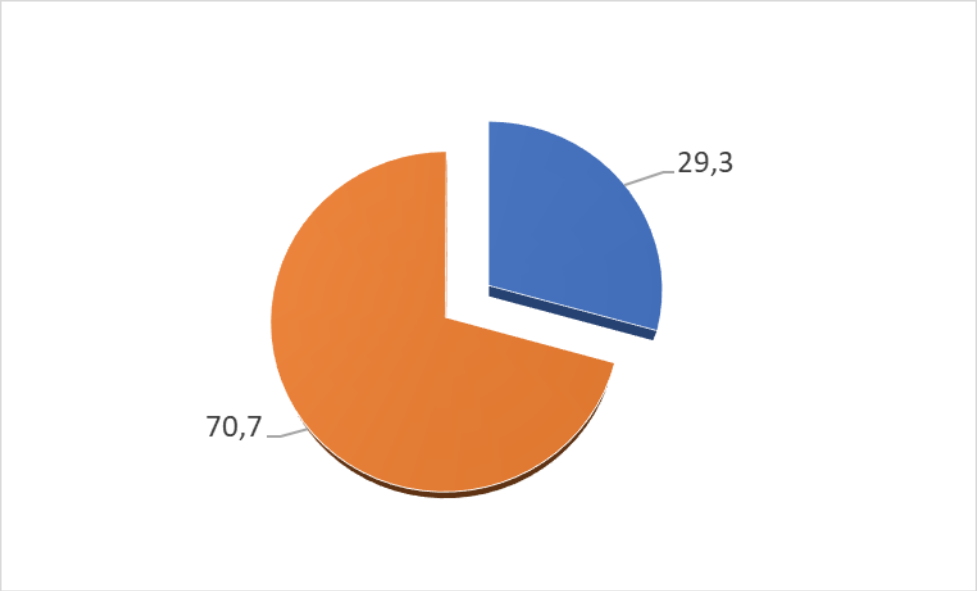

Figure 2. Detection of microfilariae in surveyed dogs in the territory of Khabarovsk

It is interesting to note that microfilariae in the blood remained mobile up to 3 days after being kept in a refrigerator at $+8^0$C. In the examination of 39 working dogs in 14 cases (35.9±7.6%) the dirofilariae were detected in the early stages of development. Examination of 336 animals from veterinary clinics revealed microfilariae in 87 of them, the rate of infestation was 25.9±2.3%. (Table 1).

Table 1.

Dirofilariosis infestation in dogs in Khabarovsk

Clinic	Total examined	Detected infestations (Abs. (Abs.)	(P,%), (m, ±)
From veterinary clinics	336	87	25,9±2,3
Service dogs	39	14	35,9±7,6
Stray dogs	284	92	32,4±2,7
Total	659	193	29,3±1,7

extensity of infestation

The rate of infestation of working dogs was 1.4 times higher than that of domestic dogs in Khabarovsk.

In the city of Khabarovsk (the capital of the Far Eastern Region), as well as in some regions of the Russian Federation, the problem of increasing number of stray dogs remains. In

the course of examination of 284 stray dogs, dirofilariosis was verified in 92 cases. The rate of infestation was 32.4±2.7% (Table 1).

Conclusion

Wide circulation of the two species of dirofilariae among animals was established; the extensiveness of the infection was 29.3% throughout Khabarovsk. The infestation rate of dogs with dirofilarias in Khabarovsk city is 29.3%. The rate of stray dogs' infestation by dirofilarias was 1.2 times higher than in dogs with owners and kept in apartments; the rate of service dog's infestation was (35.9±7.6%) and was 1.4 times higher than in domestic dogs (25.9±2.3%).

Prevention of human and animal infestation with dirofilarias is based primarily on interruption of transmissible transmission of infestation and consists of several directions: extermination of mosquitoes, identification and deworming of infested domestic dogs, prevention of contact of mosquitoes with domestic animals and humans.

References

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