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**DISTRIBUTION AND TREATMENT OF DIROFILARIOSIS OF
DOGS IN THE TOWN OF BILA TSEKVA**

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Проведеними дослідженнями встановлено, що на ураженість собак дирофіляріями впливають різні фактори: вік, стать, порода, тип утримання, сезонність.

Максимально ураженими виявилися собаки у віці 4–6 років.

Самців хворих на дирофіляріоз собак було більше, ніж самок.

Більш високу екстенсивність інвазії реєстрували у собак порід: німецька вівчарка, кавказька вівчарка, такса, лайка та безпорідні.

Максимально інвазованими виявилися дворові собаки, екстенсивність інвазії яких становила 35,9 %. У меншій мірі були уражені квартирні собаки, екстенсивність інвазії яких становила 10,2 %.

Дворові та мисливські собаки уражувалися дирофіляріями значно частіше через більший контакт з комарами – проміжними живителями.

Клінічно у хворих на дирофіляріоз собак спостерігали кашель, важке дихання, пригнічення, відмову від корму, збільшення черева, іктеричність кон'юнктиви. При аускультатії виявили шум під час систоли. Пульс був слабким. Відмічали аритмію. Спостерігали набряки, слоновість кінцівок, нервові явища, внаслідок інтоксикації розвивалася гемолітична анемія та лейкоцитоз.

Лікування з використанням дектомаксу в дозі 1 мл на 16 кг маси тіла підшкірно, глюкози з аскорбіновою кислотою, ізотонічного розчину натрію хлориду, фраксипарину, дифенгідраміну, отопротектину, рибоксину, катозалу та амоксициліну було ефективним і призвело до відновлення клінічного стану та гематологічних показників у собак за дирофіляріозу без ускладнень.

Ключові слова: дирофіляріоз, собаки, порода, вік, стать, тип утримання, екстенсивність інвазії, діагностика, лікування, дектомакс.

Problem statement. *Dirofilaria* is an extremely urgent problem in Ukraine, as it becomes enzootic. Most often, *dirofilaria* dogs are found in southern regions of Ukraine. The number of affected with *dirofilariosis* dogs and humans is increasing every year, as this is contributed to a number of factors. Because of the adaptive

properties of dirofilaria the number of intermediate hosts increases, the movement of animals in the territories of different regions are not controlled, destruction of blood-sucking insects and their habitats is the improper, there are difficulties of diagnosis and treatment [1–4].

Analysis of recent researches and publications. First dirofilaria dogs were registered in 1856 (*D. Immitis*) and in 1911 (*D. repens*, in the Crimea). In the Central regions of Ukraine dirofilaria was registered by T. Mishishin in 1988 [2].

Study of dirofilariosis in Ukraine and abroad engaged Arkhipova D. R., Wasylyk, N., Potocki M. K., Chernov V. N., Koltas I. S., Tarello W., Clemence R. G. [1–5].

In the 90-ies in Ukraine have been isolated cases of dirofilariasis of dogs, and then an increase in the number of bollène: 1997 – 3 %, in 1999 21 %, in 2002 – 55% of the studied over the years. Dirofilaria dogs were registered in the Crimea, Chernihiv, Kharkiv, Sumy and Poltava regions, in Odessa, Sevastopol, Simferopol, Kharkov. In the Kiev region dirofilaria was first diagnosed in 1998 at the clinic of veterinary medicine and old Kiev Pechersk districts of Kiev. In Kiev the number of cases of dogs amounted to: in 1999 to 15 cases in 2000 – 130, 2001 – 188, 2002 – 354, 2003 – 600 cases [2–4].

Dirofilaria registered in 2013 in Ukraine in 291 dogs [1–4].

During 1998–2000 in Odessa revealed 38 cases of dogs aged 2 to 10 years.

In Ukraine in the period 1975–1995. recorded 50 cases of dirofilariasis of people, in 1996 – 2000 – 41, 2001–2002 77 cases. In 2002, the register 52, and in 2003, 25 cases of human dirofilariasis [1–4].

According to the Department of medical Parasitology of Central SES of the Ministry of health of Ukraine in 1975–2005 there have been 434 cases of infestation in humans. In Zaporizhzhya, Donetsk and Dnipropetrovsk regions, Crimea, revealed 57 % of cases of dirofilariasis of people in the Ukraine. Also disadvantaged are Odessa, Kherson, Mykolaiv region. On 1.01.04, in the Ukraine, there were 250 cases of dirofilariasis in humans [4–7].

The mechanical action of the Mature *D. immitis* causes changes in the heart, the blood vessels that cause endocarditis, atrophy of myocardium, dilation of the right ventricle of the heart, the formation of aneurysms and embolization of parasites of the pulmonary artery, lung necrosis caused by thrombosis of the arteries [8–10].

That is why I can make conclusion that dirofilaria leads to disruption of the heart, skin lesions and death of dogs. Therefore, to prevent further spread of the disease there are necessary activities for timely diagnosis and treatment, which indicates the relevance of this research area.

Purpose of the article was to study seasonal and age-old breed of dynamics of distribution of dirofilariasis of dogs in the town of Bila Tserkva, clinical manifestations and methods of laboratory diagnosis, as well as changes in morphological parameters of blood before and after treatment of patients with dirofilariosis dogs.

Materials and methods of research. The material for the study were 10 dirofilariosis dogs and the blood from them. The control group were healthy animals.

In carrying out the work was used the complex method of epidemiological study of the spread of the disease depending on the age, sex, breed and type of content, clinical and laboratory diagnostic methods to the microfilariae, as well as hematologic - morphological (hemoglobin, number of erythrocytes, leukocytes and hematocrit) blood counts by standard methods.

For the detection of microfilariae in the field of view of the microscope they used method of diagnosis with a drop of blood dilution with saline in the ratio 1: 2.

The duration of treatment was 25 days. 5 days of treatment alternated with 5 days of rest from therapy and observe the animals.

The treatment of patients with dirofilariasis of dogs included in the first day: dectomax at a dose of 1 ml/16 kg subcutaneously, 5 % glucose solution intravenously (drip) in combination with 10 % ascorbic acid solution, 0.9% sodium

chloride solution, fraxiparin, subcutaneously , diphenhydramine 1 %, otoprotection 2,5 %, Riboxin 2 % and catosal 10 % intravenously.

In the 2nd and 3rd days of treatment regimen was the same, with the exception of dectomax.

On the 4th and 5th days of therapy was used amoxicillin 15 % subcutaneously and catosal.

Results and discussion. According to the "Journal of registration of patients of animals" on average, over 2 years parasitic diseases were found in 23,2 % of dogs.

The study found that in White Church recorded 8 contagious pathologies of animals. Most (40,3 %) were the number of sick dogs on babesiosis, or 31,7 % was otodectosis, 10,1 % – helminthiasis, 7,1 % – dirofilaria, 5,1 % – demodicosis and 4,2 % ctenocephalides. The number of patients with toxoplasmosis was 0,9 %, and sarcoptic mange – 0,6 %.

In the evaluation of the epizootic situation in Bila Tserkva for the last 2 years we noticed dirofilariosis sick dogs of different age groups. Of the 39 patients, 7 were aged 1–3 years (18,0 percent), 12 – 4–6 years (30,8 %), 11 from 7 to 9 years (20,3 %), and 9 were older than 10 years (23,1 per cent). So, most dirofilariosis sick dogs were 4–6 years of age.

We also noted that dogs of different breeds are not equally susceptible to the causative agent of dirofilariosis. The most susceptible were the dogs of German shepherd breed (20,6 %), Caucasian shepherd (17,9 percent), the rate (15,4 per cent), husky (12,8 %), mongrel (12,8 %) and boxer (7,7 per cent). So, from the study it can be concluded that most of dirofilariosis ill dogs hunting breeds, the official breed and that more are in the habitats of mosquitoes.

Regarding the sex of the dogs, for the last 2 years there were dirofilariosis ill 22 males (56,4 per cent) and 17 females (43,6 per cent), which is obviously connected with the more popular males in the population.

Regarding different types of dogs, it should be noted that the most infested were yard dogs, the extensity of invasion which constituted 35,9 %. To a lesser

extent apartment dogs were affected, extensity of invasion of which was 10,2 percent. The weak affection of apartment dogs, probably due to good conditions and, primarily, less possibility of contact with the intermediate host.

Most sick animals are registered in July–August, indicating seasonal manifestations of dirofilariosis.

The next task of our work was to study the clinical status of dogs with dirofilariosis. Considering that the clinical symptoms of this disease may be nonspecific, of crucial importance in the diagnosis are laboratory tests to detect microfilariae in the blood.

The used method of diagnosis with a drop of blood dilution with saline in the ratio 1: 2 and identification of microfilaria in the field of view of the microscope is quite convenient because it does not require much time and high economic costs.

In the study of clinical condition of patients with dirofilariosis in dogs was observed dry cough, shortness of breath. The General condition was suppressed. They refused to be fed, took compulsively lying position. They reacted weakly to external stimuli, reluctantly rose. Some bellies was noticeably increased in volume. The conjunctiva was ikterick. At auscultation of the chest in the heart area in p. O. tricuspid valve listened to a whistling noise during systole. Pulse wave was weak, thready, pulse tively positive. Noted the arrhythmia. Observed swelling in the maxillary space, the abdomen, thickening of the limbs, the nervous phenomena.

Some dogs had preserved appetite. At auscultation was auditioned muted second tone, the rhythm of the canter.

By the morphological parameters of blood, dogs affected by dirofilariasis, had low blood hemoglobin by 1,4 times. The number of erythrocytes in the researched dogs were smaller compared to healthy animals, by 1,5 times. 1,7-fold increase in the number of leukocytes. The value of hematocrit in patients dogs decreased by 5 % (tab. 1).

When applying our proposed schemes of treatment of dogs for the next two days after the first administration of dectomax in all animals general condition was

suppressed, the appetite was absent. After 5 days the dogs became more active, began to eat food.

Table 1 – **Changes of hematological parameters in dogs with dirofilariosis, n=10**

Indicators	The research group, M±m		The control group	
	Before treatment	After treatment	M±m	Lim
Hemoglobin, g/l	109,7± 0,32	139,6± 0,32	151,0±0,10	110 – 170
Erythrocytes, T/l	4,3±0,21	5,9±0,25	6,6±0,45	5,5 – 8,5
Leukocytes, G/l	15,0±0,28	9,6±0,22	9,0±0,11	8,5 – 10,5
Hematocrit, %	40,8 ± 1,31	42,2 ± 0,76	45,8 ± 0,80	42 – 48

On the 11 the day the dogs were entered the second injection of dectomax. By microscopy of blood from all animals were found the microfilariae, but 65 % of them were inanimate that testified about the positive effect of the prescribed treatment. After 6 days the general condition and appetite of the dog improved. They showed interest to the owners.

On 21 day of research the morphological parameters of blood were normalized. From eight animals living microfilaria was not found.

On 35 day of studies animals were active and playful. From none of the dogs microfilariae were found. Hematological parameters were within normal limits. Therapeutic efficacy was 100 %.

Conclusions. 1. As a result of analysis of own studies it was found that the most affected dirofilariosis were dogs aged 4-6 years of breeds German shepherd, Dachshund, husky and mongrel and yard and hunting dogs amazed dirofilaria much more often.

2. Clinically, dogs with dirofilariosis were observed coughing, difficult breath, depression, feed refusal, abdominal enlargement, conjunctivis. At

auscultation was found the noise during systole, the pulse was weak, noted the arrhythmia. Observed edema, elephantiasis of limbs, the nervous phenomena.

3. Due to the toxicity caused by the activity of dirofilaria, hemolytic anemia develops, which manifests in hypochromasia, erythropenia, a yellowness of the mucous membranes and leukocytosis.

4. The treatment regimen using dectomax in combination with pathogenetic therapy was effective and led to the restoration of the clinical condition and hematological parameters in dogs with dirofilariosis.

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РАСПРОСТРАНЕНИЕ И ДИАГНОСТИКА ДИРОФИЛЯРИОЗА СОБАК

В Г. БЕЛАЯ ЦЕРКОВЬ

СОЛОВЬЕВА Л.Н.

Проведенными исследованиями установлено, что на пораженность собак дирофиляриями влияют разные факторы: возраст, пол, порода, тип содержания, сезонность.

Максимально пораженными оказались собаки в возрасте 4–6 лет.

Самцов больных дирофиляриозом собак было больше, чем самок.

Более высокую экстенсивность инвазии регистрировали у собак пород: немецкая овчарка, кавказская овчарка, такса, лайка и беспородные.

Максимально инвазированными оказались дворовые собаки, экстенсивность инвазии которых составляла 35,9 %. В меньшей степени были поражены квартирные собаки, экстенсивность инвазии которых составляла 10,2 %.

Дворовые и охотничьи собаки поражались диروفилариями значительно чаще из-за большего контакта с комарами – промежуточными хозяевами.

Клинически у больных диروفилариозом собак наблюдали кашель, тяжелое дыхание, угнетение, отказ от корма, увеличение брюха, иктеричность конъюнктивы. При аускультации обнаружили шум во время систолы. Пульс был слабым. Отмечали аритмию. Наблюдали отеки, слоновость конечностей, нервные явления, вследствие интоксикации развивалась гемолитическая анемия и лейкоцитоз.

Лечение с использованием дектомакса в дозе 1 мл на 16 кг массы тела подкожно, глюкозы с аскорбиновой кислотой, изотонического раствора натрия хлорида, фраксипарина, дифенгидрамина, отопротектина, рибоксина, катозала та амоксициллина было эффективным и привело к восстановлению клинического состояния и гематологических показателей у собак при диروفилариозе без осложнений.

Ключевые слова: диروفилариоз, собаки, порода, возраст, пол, тип содержания, экстенсивность инвазии, диагностика, лечение, дектомакс.

Distribution and treatment of Dirofilariosis of dogs in the town of Bila Tserkva

Soloviova L.N.

Conducted research established that the affection of dogs with dirofilaria is influenced by different factors: age, sex, breed, type of content, seasonality.

The most affected were dogs at the age of 4-6 years. There were more males dirofilarios dogs than females. Higher extensity of infestation was recorded in dogs of the following breeds: German shepherd, Caucasian shepherd, Dachshund, Husky and mongrel. Mongrels were the most infested, the extensity of invasion of which constituted 35.9 %. To a lesser extent apartment dogs were affected, extensity of invasion of which was 10.2 %.

Clinically in dirofilarios dogs were observed coughing, heavy breathing, depression, feed refusal, increased belly, conjunctivitis. At auscultation the noise during systole and arrhythmias was found. Observed edema, elephantiasis of limbs, nervous phenomena, as a result of intoxication hemolytic anemia and leukocytosis was developing.

The treatment regimen using dectomax at a dose of 1 ml per 16 kg body weight subcutaneously, glucose with ascorbic acid, isotonic solution of sodium chloride, fraxiparina, diphenhydramine, otoprotection, Riboxin, catosal and amoxicillin was effective and led to the restoration of the clinical condition and hematological parameters in dogs with dirofilariosis without complications.

Key words: dirofilariosis, dogs, breed, age, gender, type of content, extensiveness of invasion, diagnosis, treatment, dectomax.

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РОЗПОВСЮДЖЕННЯ ТА ДІАГНОСТИКА ДИРОФІЛЯРІОЗУ СОБАК

У М. БІЛА ЦЕРКВА