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EXPERIMENTAL JUSTIFICATION FOR THE USE OF BIORESONANCE METHOD OF ASSESSING THYROID FUNCTION IN DOGS

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Summary. The state of the thyroid gland was studied on 36 dogs according to biochemical parameters of the blood and bioresonance testing using the 'PARKES-D' diagnostic complex, the principle of which is based on the phenomenon of biological resonance — the determination of the electrical conductivity of biologically active points when microresonance circuits are introduced into the electromagnetic contour. At the final stage of the research, comparisons of these techniques were performed. It has been established that the decrease of the functional state of the thyroid gland is accompanied by the 1.6 times increase of the thyroid-stimulating hormone content in the blood of dogs. In this case, a decrease in the level of triiodothyronine in the blood of dogs with the 21.4% hypothyroidism of the thyroid gland was established. The content of tetraiodothyronine in the blood of dogs with a decrease in the functional state of the thyroid gland was almost twice reduced, and the content of total cholesterol in the blood of dogs in the experimental group was 1.48 twice as much. There has been proven 1.7 times increase in the ratio of the total cholesterol content to tetraiodothyronine in the blood of dogs with a decrease in the functional state of the thyroid gland. The conducted researches have established that for dogs. The bioresonance is the fluctuation of the value of the electrical conductivity of the biological active points of 8–24 units of the scale of the 'PARKES-D' device, and the magnitude of electrical conductivity in the BAP varies from 22 to 61 conventional units of the device. Results of studies of the functional state of the thyroid gland in dogs using the 'PARKES-D' diagnostic complex are generally consistent with the biochemical parameters of the blood, therefore, the functional testing allows, with a probability of 94.4%, to determine the functional state of the gland.

Keywords: dogs, thyroid gland, bioresonance, hypofunction, hormones, 'PARKES-D'

Introduction. An actual problem of animal husbandry and veterinary medicine is a deep knowledge of the biological laws in the body of various species, both productive and small domestic animals.

Thyroid gland occupies an important place among the endocrine glands due to the active participation of its iodine-containing hormones, triiodothyronine and thyroxine, in the regulation of many functions of the body (Obuobie and Jones, 2003; Tielens et al., 2000). Functional activity of the thyroid gland depends largely on the flow of iodine into the body. Hypofunction of this gland is observed, first of all, in the natural zones of poor on iodine soils and water, as well as zones with high radiation (Tielens et al., 2000; Estrada et al., 2014).

In modern biology, each cell, organ, as well as the body as a whole, are considered as a source of electromagnetic radiation (EMR), which differs by its parameters — wavelength, intensity, frequency. In this case, there are distinguished normal (physiological) and pathological EMR, which arise when there is an impairment in activity of cells, organs and systems of the body (Deynekina, 2002). According to modern ideas, all actions of environmental factors are perceived by the body, first of all, at the level of the energy shell, which is the primary barrier to the action of any external factor on the body (Bol'shakov, 2002).

In recent years, scientific research with the use of electromagnetic radiation (EMR) has been intensified in determining the functional state of organs and systems of the body (Kochieva, 2006).

The purpose of the work. The purpose of our research was to study the functional state of the thyroid gland in dogs and to evaluate the informativity of the data of the applied diagnostic complex 'PARKES-D', the principle of which is based on the phenomenon of biological resonance.

Materials and methods. The experiment was conducted in the conditions of Kharkiv veterinary clinics in 36 dogs of different breeds aged 4–9 years and with a body weight of 25–33 kg. The conditions for keeping and feeding animals complied with the requirements. An assessment of the endocrine function of the thyroid gland was performed by biochemical blood tests.

Blood for research was taken in the morning before feeding, blood serum levels were determined by the content of thyroxine, triiodothyronine, thyroid stimulating hormone (by immunoassay), and the total cholesterol-enzyme-photometric method (Chol-DAC.Lq kit by SpectroMed® R. L.). In addition, the index of the ratio of total cholesterol to tetraiodothyronine was calculated. Digital data was processed statistically.

Based on the analysis of the obtained material, two groups of dogs with different levels of functional state of the thyroid gland were obtained: control (without changes in the functional state of the thyroid gland) and experimental (with a decrease in the functional state).

After that, there was created and tested the program of individual bioresonance testing of the evaluation of the functional state of the thyroid gland with the help of the applied diagnostic complex 'PARKES-D'. The principle of which is based on the phenomenon of biological resonance — the determination of the electrical conductivity of the BAP when micro resonance circuits are introduced into the electromagnetic contour.

Resonance is characterized as the strong growth of the amplitude of electromagnetic oscillations under the influence of external actions, when the frequency of the internal oscillations of the object coincides with the frequency of oscillations of the external action. For bioresonance testing, biologically active points that were localized on the anterior limbs from the anterior surface of the foot, on the skin between 2–3, 3–4, and 4–5 phalanges were used. At the final stage of the research, comparisons were made between these research methods.

Results. Table 1 provides results describing the functional state of the thyroid gland in dogs. It has been determined that the decrease in the functional state of the thyroid gland is accompanied by 1.6 times ($p < 0.001$) increase of thyroid hormones in the blood of dogs compared with the parameters in dogs from the control group.

In this case, a decrease in the level of triiodothyronine in the blood of dogs at hypothyroidism of the thyroid gland by 21.4% was determined. Thus, the content of the hormone in the blood of dogs in the control group fluctuated within 21–75 ng/dl, whereas in animals with a decrease in the functional state of thyroid gland, it was 31–39 ng/dl.

Table 1 — Blood indices of dogs with different levels of functional state of the thyroid gland (M ± m, Σn = 36)

Indices	Animal groups			
	Control (n = 31)		Experimental (n = 5)	
	M ± m	Lim	M ± m	Lim
Thyroid-stimulating hormone, ng/cm^3	0.24 ± 0.04	0.13–0.41	0.38 ± 0.01**	0.35–0.42
Triiodothyronine, ng/dl	42.77 ± 6.5	21–75	33.6 ± 1.57	31–39
Tetraiodothyronine, μg/dl	2.09 ± 0.22	1.48–3.01	1.17 ± 0.11**	0.84–1.36
Cholesterol, mmol/dm^3	5.58 ± 0.34	4.55–6.67	8.26 ± 0.99***	6.6–11.5
CHS/T4, conditional units	0.14 ± 0.02	0.09–0.23	0.24 ± 0.02***	0.21–0.29

Note. Reliable difference from the experimental group: * — $p < 0.05$; ** — $p < 0.01$; *** — $p < 0.001$.

In contrast to triiodothyronine, the content of tetraiodothyronine in the blood of dogs at reducing the functional state of thyroid gland significantly decreases, almost two times ($p < 0.001$). Thus, the reference values of the content of this hormone in the blood of dogs in the control group were 1.48–3.01 μg/dl, and in the experimental group, respectively, 0.84–1.36 μg/dl.

According to the published data, in the case of the subclinical form of hypocotylose a decrease in the content of high-density lipoprotein (HDL) and increased concentration of low density lipoprotein (LDL), triglycerides and total cholesterol (Nechyporuk and Korda, 2015) is observed in blood. Thus, the content of total cholesterol in the blood of dogs in the experimental group was 1.48 times ($p < 0.001$) higher than the values in animals in the control group.

Indicator of the ratio of total cholesterol to tetraiodothyronine (CHS/T4) is another reliable criterion for evaluating the functional state of the thyroid gland. 1.7 times increase of the index CHS/T4 ($p < 0.001$) in the blood of dogs with a decrease in the functional state of the thyroid gland was determined compared with the values in the animals of the control group.

Moreover, the reference values of this index in the blood of the dogs of the control group were 0.09–0.23 conditional units, respectively, in the experimental group — 0.21–0.29 conditional units.

The conducted researches have established that for dogs the bioresonance is the fluctuation of the value of the electrical conductivity index of the biological active points of 8–24 scale units.

The electrical conductivity in the BAP of the scale of the complex in the experimental dogs varied from 22 to 61 conditional units. It should be noted that the electrical conductivity in the most informative biologically active points (between 2–3, 3–4 and 4–5 phalanges of the anterior limb) differs by no more than 1–2 conditional units, which allows to use even one point for a reliable assessment of the functional state of the thyroid gland (Table 2).

During the study of the phenomenon of bioresonance with the use of nosode for the evaluation of the function of the thyroid gland in 36 dogs, seven animals with reduced functional status were detected. It should be noted that the data on 5 dogs are consistent with the indicators of biochemical blood tests (which indicate a decrease in the function of the thyroid gland), and in two dogs in which bioresonance was determined concerning the violation of the functional state of this gland, biochemical blood parameters were within the normal range.

This may indicate a hidden form of change in the functional state of the thyroid gland.

Table 2 — Testing of the functional state of the thyroid gland in dogs by the 'PARKES-D' diagnostic complex (M ± m, Σn = 36; conditional units)

Animal groups	BAP localization		Indicators		
			Without nosode	With nosode	Difference (resonance)
Control (n = 29)	Between 2–3 phalanges	M ± m	38.48 ± 6.08	53.07 ± 5.5	14.59 ± 2.07
		Lim	23–60	34–70	8–22
	Between 3–4 phalanges	M ± m	38.34 ± 6.03	53 ± 5.3	14.66 ± 2.14
		Lim	22–61	35–72	9–23
	Between 5–6 phalanges	M ± m	38.52 ± 5.92	53.24 ± 5.18	14.72 ± 2.09
		Lim	22–60	35–69	8–22
Experimental (n = 7)	Between 2–3 phalanges	M ± m	37.14 ± 3.48	52.43 ± 3.2	15.29 ± 2.41
		Lim	26–47	46–63	8–22
	Between 3–4 phalanges	M ± m	36.71 ± 3.25	52.29 ± 3	15.57 ± 2.55
		Lim	25–45	45–63	8–23
	Between 5–6 phalanges	M ± m	36.43 ± 3.38	51.71 ± 2.51	15.29 ± 2.75
		Lim	23–44	46–61	8–24

Note. Reliable value of the bioresonance index is R ≥ 8.

Consequently, the results of studies of the functional state of the thyroid gland in dogs according to different methods are consistent by 94.4%.

Conclusions and perspectives for further research. Thus, the use of the functional testing by the hardware and software diagnostic complex 'PARKES-D' for a comprehensive assessment of the state of organs and systems of an animal's organism allows, with a reliability of 94.4%, to establish the functional state of the thyroid gland.

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