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EFFECT OF THE “ADAPTOVIT” MEDICATION ON PSYCHOPHYSIOLOGICAL CHARACTERISTICS AND THE PSYCHOEMOTIONAL STATUS OF DOG HANDLERS

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Key words: “Adaptovit”, adaptogen, dog handlers, complex visual-motor reaction, CVMR-3, “Psychophysiologist” device, professional workloads, psychoemotional state, self-assessment questionnaire.

Annotation. The aim of this study was the effect of the “Adaptovit” medication on psychophysiological indicators and the psychoemotional status of specialists of canine units of the Ministry of Internal Affairs of the Russian Federation, whose work implies increased physical and mental activity, as well as a high level of psychoemotional stress. During a month, representatives of the experimental group took an adaptogen. At the beginning and at the end of the study, indicators of a complex visual-motor reaction and psychoemotional indicators were measured. The positive effect of the biologically active supplement “Adaptovit” was revealed. This effect consists in maintaining the adaptive capabilities and stability of dog handlers to conditions of physical and psychoemotional loads.

Introduction. Life of a modern human, despite the field of work activity, is accompanied by a constant influence of stress factors of informational and psychoemotional nature. Many professions also imply serious physical loads. Moreover, strong or continuous overstrain of functional systems of the organism often exceeds the ability to recover, which, in its own turn, leads to different pre-pathological and pathological states. Therefore, issues of the human’s adaptation to professional workloads are currently relevant and are being studied by a great number of experts in different scientific fields: physiology, psychology, medicine, including sports, military, adaptation, occupational medicine, nutraceuticals, etc [1-5].

According to modern views, a risk of adaptation overstrain can be achieved with an increase of the organism's performance and a recovery of adaptation potential after loads.

Adaptation resources of the organism can be increased with a comprehensive approach, including many aspects of life: rational nutrition, autogenic training, correct work and rest routine, quality sleep, moderate physical activity and mental loads, limiting influence of stress factors, improving the immune system and use of adaptogens. They are special, mostly plant-based substances, which possess general toning properties and contribute to the maintenance of the appropriate functional state of the organism, faster recovery after loads, and, eventually, to the increase of performance.

One of these substances is the energy modelling set called "Adaptovit" (made by the "Siberian health" corporation), which is a set of water extracts of medicinal plants: maral root, golden root, ginseng, eleuthero, chinese angelica-tree and chinese magnolia-vine. Each of these plants possess strong adaptogenic properties [6-9]. However, big doses of such components can lead to undesirable effects [10-11]. The "Adaptovit" medication contains active compounds in subthreshold doses, which contributes to an absence of the development of side effects in general adaptogenic activity. Positive experience of using this medication in comprehensive therapy when treating the iron-deficiency anemia [12] for increasing adaptation capabilities of children, including children with disturbed visual functions [13], as well as for increasing performance of athletes [14], allowed us to suggest a possibility for its use to support performance of dog handlers. Professional workloads of dog handlers include both a component of physical activity and cognitive and psychoemotional components. A combined effect of physical and psychoemotional loads can significantly reduce performance and stress tolerance of experts of cynological units.

The purpose of our study is to examine the effect of the "Adaptovit" medication on psychophysiological characteristics and the psychoemotional status of dog handlers.

Methods and organization. The study was conducted in the base of the Rostov Dog Training School for Operational and Search Activity of the Ministry of Internal Affairs of the Russian Federation. Thirty employees of cynological units were examined. Criteria of participating in the study included male sex, an absence of acute and chronic diseases and a written informed consent for participation. Average age of examined dog handlers was 28,05±1,05 years. All dog handlers, who participated in the study, had the same routine of work and rest, physical and mental loads, nutrition, regulated by conditions of training in specialized educational organization. All subjects were divided into two groups: 1 – the comparison group

(n=15) and the second group (n=15), which included dog handlers, who took the "Adaptovit" medication made by "Siberian health" according to a following scheme: every day for 30 days, 1 time a day in the morning. The "Adaptovit" medication is characterized by availability, is easy to use and does not need a prescription.

A high adaptive run-out in dog handlers is primarily related to high mental loads, with the fact that professional activity implies not only responsibility for their own actions, but also full responsibility for actions of a service dog, for end results of its work both in the school and in real use conditions. Elements of unpredictability of dog's actions, high requirements to results of the work cause a high psychoemotional stress in experts of such category.

We conducted psychophysiological and psychodiagnostic tests twice: at the beginning of the study and 30 days after, to evaluate psychoemotional stress and define the psychoemotional state of dog handlers in both groups.

Using the device of psychophysiological testing "Psychophysiologist" (DPPT-1/30) (made by the LLC SPEF "Medikom MTD", Taganrog), following indicators of the complex visual-motor reaction (the CVMR-3 test) were defined: the level of strength of the excitation processes, sensorimotor reaction level, accuracy level, speed of response level, which allows us to judge features of neurodynamic processes of dog-handlers. These indicators are often used to define professional performance and degree of fatigue, because when experiencing fatigue and psychoemotional stress, mobility of nervous processes is reduced, reaction time and/or a number of made mistakes when performing tasks increases [15].

The evaluation of the complex visual-motor reaction was conducted in three stages, at each of which the signal value of color stimuli changed. At the first stage, a dynamic stereotype was developed according to the differentiating inhibition principle – turning the green light stimulus off by pressing the "yes" button, turning the red light stimulus by pressing the "no" button. Stimuli were shown in a random order (40 stimuli total). At the second stage, the task was changed to the opposite: the "no" button should be pressed if the green light stimulus appears, the "yes" button – when the red light stimulus appears (35 stimuli in a random order). It contributed to the elimination of an old stereotype and the formation of a new one. At the third stage of testing the complex visual-motor reaction, the test subject turned off only the red light signal, not paying attention the green one (35 stimuli in a random order). This three-stage test with changing tasks allowed evaluating both the strength of nervous processes and their mobility.

In order to define a level of situational (reactive) and personal anxiety according to the Spielberger-Hanin test, the SHTS test, included in the set of the "Psychophysiologist" device. The test included 40 estimation questions: 20 of them considered the emotional state at the current moment to define a level of situational

anxiety, other 20 questions considered the general every day state to define a level of personal anxiety.

To determine the psychoemotional state, a 7-point self-assessment questionnaire was also used according to the L.Kh. Garkavi's method [16].

Table 1

Results of testing the complex visual-motor reaction

Indicators of the complex visual-motor reaction	Comparison group (n=10), M±m						Experimental group (n=10), M±m					
	initial values			after a month			initial values			after a month		
The level of strength of the excitation processes (1 – the lowest point, 5 – the highest point)	4,9±0,1			4,6±0,2			4,3±0,3			4,5±0,3		
CVMR-3 stages	1	2	3	1	2	3	1	2	3	1	2	3
The level of sensorimotor reaction according to stages (1 – the highest)	2,1± 0,4	3,1± 0,5	1,5± 0,3	1,9± 0,5	3,2± 0,4	2,0± 0,4	2,4±0,4	3,2± 0,3	2,0± 0,4	2,4±0,4	3,0± 0,3	1,6± 0,3
The accuracy level (1 – the lowest)	3,6± 0,3	2,7± 0,5	4,5± 0,3	3,7± 0,5	2,7± 0,4	4,0± 0,4	3,9± 0,5	3,2± 0,5	4,1± 0,4	3,8± 0,5	3,7± 0,4	4,3± 0,2
The speed of response level (1 – the lowest)	4,6±0,2	3,8± 0,2	4,5± 0,2	4,3± 0,3	3,9± 0,5	4,1± 0,3	3,9± 0,4	3,3± 0,4	4,3± 0,3	3,9± 0,3	3,1± 0,4	4,2± 0,3

The tests were carried out in similar conditions for subjects of both groups. After the first test, experimental group members took the "Adaptovit" (2-3 doses) medication under the tongue every day for 30 days. During this month, an active training of dog handlers took place. Since it was a final stage of training, during which test subjects of both groups were subject to increased physical (classes with service dogs, physical training classes, including general physical training and combat techniques of wrestling) and psychoemotional loads (upcoming exams), 90% of classes were carried out outside in any weather and any time, which brought conditions of the study closer to conditions of professional workloads of dog handlers in the places of service. The results obtained are statistically processed in Excel using the Student's t-test.

Results and discussion. Results of the 3-stage test with changing tasks aimed at the complex visual-motor reaction are presented in table 1. If we consider indicators of sensorimotor reactions, accuracy and speed of response according to stages, we can conclude that the second stage, related to a change of stereotype, caused the greatest difficulties. Thus, dog handlers of both groups demonstrated the lowest result exactly at the second stage. The third stage task was the easiest, which is why indicators mentioned above were the highest in both groups. Moreover, in the experimental group, unlike the comparison group, a tendency towards the improvement of a level of sensorimotor reaction and accuracy was revealed, especially at the second and third stages of the test for the complex visual-motor reaction. By the end of the study, the level of strength of the excitation processes increased in the experimental group.

From this perspective, a conclusion can be made about a positive effect of the adaptogen on neurodynamic processes of dog handlers.

As a result of the study, a positive effect of the "Adaptovit" supplement on the psychoemotional state of dog handlers (Table 2).

Table 2

Results of the study on the psychoemotional state

The psychoemotional state indicators	Comparison group (n=10), M±m		Experimental group (n=10), M±m	
	initial values	after a month	initial values	after a month
according to the Spielberger-Hanin test:				
situational anxiety	31,4±1,4	30,6±1,8	32,4±1,5	30,4±2,8
personal anxiety	29,4±1,3	29,6±1,7	31,4±2,0	30,7±2,8
according to the L.Kh. Garkavi's questionnaire:				
anxiety	-2,5±0,3	-2,6±0,2	-2,1±0,3	-2,7±0,2
irritability	-1,5±0,3	-1,5±0,3	-1,8±0,3	-2,0±0,4
fatigability	-2,1±0,2	-1,9±0,2	-1,8±0,2	-2,2±0,3
frustration	-2,1±0,1	-2,1±0,2	-2,0±0,2	-1,8±0,3
performance by time	2,0±0,3	0,1±0,7*	1,5±0,2	2,0±0,3**
performance by speed	1,7±0,3	1,4±0,3	1,4±0,2	1,4±0,3
appetite	1,8±0,1	1,9±0,3	1,1±0,4	1,8±0,4
sleep	1,4±0,3	0,8±0,6	1,8±0,4	1,8±0,5
optimism	2,2±0,1	2,1±0,2	1,6±0,3	1,6±0,3
activity	1,9±0,2	1,7±0,2	1,9±0,1	1,9±0,4

Note: *$p<0,05$, compared with initial values; **$p<0,05$, compared with the control at the same stage

We revealed a strong correlation between indicators of the situational and personal anxiety of dog handlers ($0,7<r<1$). The level of situational and personal anxiety in test subjects of both groups at the beginning and at the end of the study had a borderline value between low and moderate levels. It indicated the stable

psychoemotional state of dog handlers during the whole study. The results, obtained when using the L.Kh. Garkavi's questionnaire, show the state of adaptation potential in test subjects. The data obtained show a high level of adaptation reserve in dog handlers of both groups at the beginning of the study. A month after, specific changes in a number of examined indicators were registered. At the same time, for almost all indicators in the experimental group, unlike the comparison group, by the end of the study, the dynamics of changes more favorable for the body was noted.

In dog handlers of the comparison group, fatigability increased, performance by time and by speed reduced. High learning loads affected sleep, activity and optimism. These changes indicate a possibility of adaptation processes shifting to the state of reactivation, characterized by a high risk of the adaptation failure and shift into the state of moderate stress.

In dog handlers of the experimental group, the levels of anxiety, irritability and fatigability reduced. However, the most significant changes in the positive direction were registered in the performance by time. Indicators of sleep, optimism and activity remained unchanged in case of the improved appetite. Registered changes allow considering the shift of adaptation processes into the stable state with a high adaptation potential of the organism at the expense of balanced vegetative and central regulations of the homeostasis.

Conclusion. The "Adaptovit" supplement contributes to the improvement of the psychoemotional state of dog handlers. In the experimental group, by the end of the study, higher indicators of the strength of excitation processes, sensorimotor reaction, accuracy, improvement of performance by time were registered. Tendencies to increase appetite, reduce anxiety, irritability, fatigability, as well as the preservation of optimism, activity, support of sleep and performance by sleep were also revealed. Therefore, as a result of the conducted study, a positive effect of the "Adaptovit" medication on psychophysiological and psychoemotional indicators of dog handlers, which consists of the more economic usage of functional capabilities of the organism in conditions of increased loads.

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