Promising methods for assessing the psychophysiological adaptation of a person to extreme situations

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Many professions are associated with activities in extreme conditions: firefighters, special forces, military personnel of the peacekeeping contingent, drivers of heavy vehicles over long distances, etc. Extreme situations are characterized by the swiftness of events, lack of time, great psychological and physical stress, the presence of risk factors for human health and life. The specified features of activity in extreme situations place increased demands on the psychophysiological state of a person, on the adaptive capabilities of his body.

For work in extreme conditions, a professional selection is carried out, the program of which depends on the specifics of the profession. An important component of professional selection and further monitoring of a specialist's performance is an assessment of the psychophysiological adaptation of his body to specific conditions of activity. A fairly complete description of the adaptive capabilities of the human body can be obtained using several types of research: psychological testing, assessment of the body's energy supply, the level of adaptation, anthropometric data.

In extreme conditions, the psychological characteristics of a person can significantly affect behavior and professional performance [1, 2]. In persons in a state of depression or increased anxiety, an extreme situation can cause neuropsychic dysadaptation.

Our experience in testing the military personnel of the peacekeeping contingent (320 people) showed sufficient informational content of at least three psychological tests (Eysenck EPi, "Adaptability", revealing a tendency to deviant forms of behavior, or the Bass-Darki test). They make it possible to assess the neuropsychic stability of servicemen and express it in a convenient form - on a five-point scale [3]. For flawless performance in extreme conditions, a person's neuropsychic stability should be at the level of 5–4 points.

The state of the body's energy supply significantly affects the endurance and performance of a person. The data of quadrant measurements according to R. Voll make it possible to assess the energy level of the organism's reactivity (normergy, hyperergia, hypoergy, asthenia). A more accurate result of assessing the energy level of the human body can be obtained using the well-known segmental diagnostics (SD), which registers the result of threefold measurements of direct current conductivity with a current load of different polarity [4].

We used another modern device for assessing the energy state of military personnel - a digital biorhythm analyzer (DAB) of the body [5]. Information about the state of the body is collected by electrodes placed on the area of the radial arteries. After 5-6 minutes, you can get the result of a study of the level of energy supply of the body (and a number of other important parameters of its activity) with quantitative and verbal characteristics: the maximum level (80-100%), normal (60-79%), below the norm (40- 59%), low (20–39%), critical (19% and less).

To study the level of adaptation of the organism, one can use electropunctural diagnostics according to R. Voll, with automated calculation of adaptation coefficients by systems, or vegetative resonance test. However, electropuncture research methods require special training of personnel, and the diagnostic results depend on the qualifications and condition of the operator (diagnostician). In addition, in mass or group studies, electropuncture methods are time consuming. Therefore, it was considered more appropriate to assess the level of adaptation of the organism using diabetes mellitus. In a short period of time (5–6 minutes), one can obtain information about the adaptive potential of the circulatory system according to R.M. Baevsky and on the state of general nonspecific adaptive reactions according to L.Kh. Harkavi.

Sufficiently convincing information about the level of adaptation of the organism, with the determination of a quantitative indicator, is provided by a study using the CAB. Based on a set of simple studies: psychological testing, quadrant measurements, SD, CAB, s

taking into account anthropometric data, it is possible to give an objective assessment of the adaptive capabilities of a person. In accordance with the developed assessment criteria, we used the following classification of the levels of psychophysiological adaptation of the organism: high, medium, low, failure of adaptation.

Our experience in assessing the psychophysiological adaptation of the body is made up of studies in 620 people. Of these, 210 studies were conducted in military personnel of the conscription and peacekeeping contingent, and the rest - in patients with various chronic pathologies. It should be noted that in patients with chronic pathology of diabetes mellitus and CAB were performed from two to ten times: before treatment, during the course of treatment, during the period of treatment and to monitor its effectiveness. This tactic made it possible to quickly adjust the treatment plan and achieve good therapy results in a relatively short time. At the same time, the results of treatment were additionally monitored by classical, generally accepted methods (blood test, ECG, X-ray, ultrasound, etc.).

The study of the level of adaptation among servicemen was carried out in various age groups. We will give data only on hardware research methods - using SD and DAB,
which are given in table. 12.

Table 1

Indicators of the level of energy supply

Age of study given (years)	Energy supply level (number of persons - in%)		
	high	average	short
18–20	15.4	30.8	53.8
21-30	20.3	38.6	41.1
31 and older	17.0	37.5	45.5

According to the table. 1 shows that the age group 18–20 years old (in mostly draft contingent) had the worst indicators of the energy level. The best indicators are in the group of 21-30 years old, it was made up of the military personnel of the peacekeeping contingent (contract service).

table 2

The level of adaptation of the body of military personnel

Age of study given (years)	Energy supply level (number of persons - in%)			
	high	average	short	disruption of adaptation
18–20	38.2	33,7	28.1	-
21-30	42.3	35.1	22.6	-
31 and older	40.5	36.2	23.3	-

Data analysis table. 2 showed: as in table. 1, the best indicators were obtained in the age group 21-30 years old, worse - in the age group 18-20 years old. These coincidences are not accidental, they testify to the relationship between the state of energy and adaptation of the organism. The military personnel of the peacekeeping contingent were over the age of 22, many of them served in the army. They underwent special physical, moral and psychological training. This explains the higher level of adaptation of the organism in these servicemen.

A more detailed analysis of the data from a complex of psychophysiological studies of military personnel showed that hyperergy and sympathicotonia were more often detected in persons with severe anxiety and aggressiveness. According to the CAB, they experienced a rapid depletion of energy resources (study before and after exercise). In persons with severe hypoergia, parasympathicotonia, a significantly reduced body weight-to-height ratio, the level of adaptation was lower than in other servicemen.

In all age groups, persons with low indicators of energy supply and the level of adaptation of the body were identified. They are classified as a risk group for psychophysiological dysadaptation. A training program has been developed for them, which includes a certain set of necessary measures to correct the identified changes.

In conclusion, it should be noted that the proposed methods for assessing the psychophysiological adaptation of persons whose activities are associated with extreme situations are quite informative, simple, and do not require special conditions for their implementation. Hardware studies using DM and CAB are express methods that provide an objective characteristic not only of the state of adaptation of the organism, but also allow assessing psychoemotional characteristics, the state of autonomic and central regulation and a number of other parameters of the human body's activity.

Conclusions:

1. Assessment of the psychophysiological adaptation of a person to extreme situations we recommend to carry out using a complex of studies: psychological testing, determination of the energy level and the level of adaptation of the organism.

2. It is advisable to study energy supply and the level of human adaptation express methods of segmental diagnostics and digital analyzer of body biorhythms.

3. The proposed method for the study of psychophysiological adaptation of a person objective, informative, visual, easy to use.

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