



Application of autogenic training technique in integrated rehabilitation of patients with chronic fatigue syndrome

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Abstract. *Objective.* To systematize and generalize scientific and methodological knowledge and results of practical experience of autogenous training usage in patients with chronic fatigue syndrome. *Methods.* Theoretical complex analysis of scientific and methodical literature and sources, instrumental methods of research (spirometry, peakflowmetry). *Results.* The results of own studies of patients (39 women and 27 men) with chronic fatigue syndrome were analyzed. On the basis of findings received within 2 months, the author has practically established the positive influence of autogenous training method on the state of the respiratory system. *Conclusions.* Analysis of lung respiratory function indices in men and women with chronic fatigue syndrome showed the improvement of all of them. In addition, the application of autogenous training method confirms the possibility of indirect regulation of the respiratory system. The prospect of further research consists in assessing the respiratory system state in patients with chronic fatigue syndrome at distant stages of observation (12 months and more).

Keywords: autogenic training, chronic fatigue syndrome, physical rehabilitation.

Застосування методики аутогенного тренування в комплексній реабілітації пацієнтів із синдромом хронічної втоми

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Резюме. *Мета.* Систематизувати та узагальнити науково-методичні знання і результати практичного досвіду застосування аутогенного тренування у пацієнтів із синдромом хронічної втоми. *Методи.* Теоретичний комплексний аналіз науково-методичної літератури та джерел, інструментальні методи досліджень (спірометрія, пікфлоуметрія). *Результати.* Проаналізовано результати власних досліджень пацієнтів (39 жінок і 27 чоловіків) із синдромом хронічної втоми. На підставі отриманих протягом 2 міс. результатів автором практично встановлено позитивний вплив методики аутогенного тренування на стан дихальної системи. *Висновки.* Аналіз показників дихальної функції легень у чоловіків і жінок із синдромом хронічної втоми показав поліпшення всіх показників дихальної функції легень. Крім того, застосування методики аутогенного тренування підтверджує можливість непрямої регуляції діяльності дихальної системи. Перспективою подальших досліджень є оцінка стану дихальної системи у пацієнтів із синдромом хронічної втоми на віддалених етапах спостереження (через 12 міс. та більше).

Ключові слова: аутогенне тренування, синдром хронічної втоми, фізична реабілітація.

Применение методики аутогенной тренировки в комплексной реабилитации пациентов с синдромом хронической усталости

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Резюме. *Цель.* Систематизировать и обобщить научно-методические знания и результаты практического опыта применения аутогенной тренировки у пациентов с синдромом хронической усталости. *Методы.* Теоретический комплексный анализ научно-методической литературы и источников, инструментальные методы исследований (спирометрия,

пикфлоуметрия). *Результаты.* Проанализированы результаты собственных исследований пациентов (39 женщин и 27 мужчин) с синдромом хронической усталости. На основании полученных в течение 2 мес. результатов автором практически установлено положительное влияние методики аутогенной тренировки на состояние дыхательной системы. *Выводы.* Анализ показателей дыхательной функции легких у мужчин и женщин с синдромом хронической усталости показал улучшение всех показателей дыхательной функции легких. Кроме того, применение методики аутогенной тренировки подтверждает возможность косвенной регуляции деятельности дыхательной системы. Перспективой дальнейших исследований является оценка состояния дыхательной системы у пациентов с синдромом хронической усталости на отдаленных этапах наблюдения (через 12 мес. и более).
Ключевые слова: аутогенная тренировка, синдром хронической усталости, физическая реабилитация.

Problem statement. Currently, chronic fatigue syndrome (CFS) is recognized as the most important deadaptation [1]. The concept of a syndrome characterizes a set of potential interrelated symptoms and signs. When a disease includes the term “syndrome”, this means either that still not all is known about it or that patients are not equally responsive to a particular treatment method [1, 3].

According to the Infectious Disease National Centers and Centers for Disease Control and Prevention, the overall annual incidence of recorded cases of CFS in the United States for the period from 1996 to 2000 were found to range from 4 to 10 individuals per 100,000 cases (18 years and older), regardless of gender and race. According to the epidemiological services of the United States, there are at least from 30 to 50 thousand people with CFS in the US. It is quite obvious that the total number of patients with CFS is steadily growing [2, 4–6].

Analysis of recent research and publications. Some authors [7-8] called CFS “a secular infection”. They argue that this disease more often affects highly educated, energetic and intelligent people. The patients with CFS were reported to express a desire for success and the fear of making mistakes. Nevertheless, the evidence for such assumptions seems insufficient [10].

Another urgent problem faced by many patients with CFS is that the surrounding people do not see their fatigue [1, 3]. Therefore, the complaints of the patients themselves along with the response of people around them lead to the social isolation of the patient. The authors claim that most of these patients, by virtue of their own character, depend on emotional support of people and on their care, as well as are afraid of loneliness, concentrate their attention on personal problems.

Currently, the chronic fatigue syndrome occurs mostly in regions with high levels of environmental pollution by harmful chemical substances or with increased levels of radiation. These factors adversely affect the immune system, by weakening

it (clinically this stage is defined as the increased fatigability syndrome), that contributes to the activation of latent viruses, emergence of persistent viral infection damaging the central nervous system, mainly the temporal limbic region. The development of the body’s stress response, especially under the intense and prolonged action of disturbing factors, depends to a large extent on the hypothalamic-pituitary-adrenal axis, nervous and immune systems, whose flexible interaction and stable functioning determine the tolerance of the body to psycho-emotional stress and to the impact of various environmental factors. Disruption of interactions between the nervous, immune and endocrine systems plays a crucial role in the development and progression of CFS [11].

Despite the fact that this syndrome is not life-threatening to the patient, it exerts its adverse effects on the patient somatic health, thus reducing by 50 % or more his physical activity, causing disturbances in the functioning of various body systems, as well as disturbing the mental condition of an individual that causes a negative attitude of people close to him and in the social environment as a whole. The urgency of the problem and the crucial need to identify the appropriate methods of treatment for this psychosomatic disorder determined the choice of the research topic.

The aim of the work is to evaluate the outcomes of applying the autogenic training technique in rehabilitation of patients with chronic fatigue syndrome on the basis of short-term (2 months) research.

Methods and organization of the study. The study involved 63 patients with chronic fatigue syndrome. There were 39 women and 27 men among them. The average age of the women was 46.27 ± 8.88 years and that of the men was 49.76 ± 8.61 years.

The method of spirometry was used to assess the extent of ventilatory disorder as well as to evaluate the treatment effectiveness. The most convincing sign of ventilation disorder is the

degree of decrease in the forced expiratory volume in the first second (FEV₁) and / or vital capacity (VC). The respiratory rate (RR) was determined from the spirogram.

Normal values: the average respiratory rate for healthy persons is 16–18 breaths per minute. Under conditions of maximum exertion, RR increases to 40–60 breaths per minute.

Peak flowmetry, the measurement of peak expiratory flow rate using peak flow meter, was also used to evaluate objectively the lung function, particularly to assess the degree of airway narrowing.

Interpretation of peak flowmetry data:

- Peak expiratory flow rate (PEFR) > 90 % of the normal expected value is the norm;
- PEFR = 80–89 % of the normal expected value is assumed norm, the patient needs a dynamic observation;
- PEFR = 50–79 % of the normal expected value is a moderate decrease, the patient requires increased therapy;
- PEFR < 50 % of the normal expected value is a sharp decrease, the patient needs hospitalization.

The results of the two-month study (stationary stage) were analyzed and subjected to statistical treatment.

Results of the study and discussion. One of the methods for treating neurohumoral disorders and recovering a person's mental state is autogenic training. Autogenic training is a method of auto-suggestion, in which the patient first attains a relaxation of muscle tone, i.e. the state of relaxation, and then, in this relaxed state, continues self-suggestion, which is aimed at changing one or another functions of his body [11].

It is quite obvious that the autogenic training technique can be used as a method of recovery from various functional and neurotic disorders in the body of persons suffering from chronic fatigue syndrome.

It has already been proven that autogenic training is a powerful and effective method of rehabilitating patients with various psychological and neurological diseases.

The principle of autogenic training is that with the help of certain mental exercises the mechanisms of «stress» are leveled and recovery processes are stimulated in the patient's body, which are based on a deep psychophysical relaxation [2, 4–7].

The autogenic training is implemented as follows:

The first stage. There is a close relationship and interdependence between the central nervous system, breathing and the tone of skeletal muscles. A person consciously relaxes the muscles and,

then, feels heaviness in the muscles. Conscious relaxation of muscles and the presence of the above relationship between the central nervous system and muscle tone are realized in the form of the desired effect, which is expected from the autogenic training [6].

The authors point out that respiratory rate, like muscle tone, is associated with the individual's mentality: rapid breathing improves the mental state, while slow breathing depress the activity of the central nervous system.

Autogenic training uses recommendations which exist in a person's real sense of warmth or heaviness. Initially, the rehabilitologist teaches the patient to use a sensation of heaviness or warmth in the upper or lower limbs and then the connections to the breathing and other body systems.

The second stage of teaching the patient the autogenic training technique relates to the ability of the patient to use any mental representations or images, which make possible to change the state of the patient's central nervous system.

This stage, which includes the use of various mental images or representations, occupies an important place in the work with patients suffering from chronic fatigue syndrome, as the main complaints they have are chronic fatigue, impairment of mental activity, weakening of physical abilities, reduced physical performance, and deterioration of the respiratory and cardiovascular systems functioning.

When teaching the patient the autogenic training technique, the rehabilitologist, by saying words, induces positive emotions in the patient's mind: cheerfulness, freshness of consciousness, increased physical working capacity, normalization of blood pressure and heart rate, in contrast to the complaints of patients with CFS.

The positive feelings and representations induced by autogenic training in the patient's mind allow him to get rid of the negative emotions caused by his illness.

The next stage of teaching the patient the autogenic training technique relates to the influence of the words he says mentally and out loud on his mental state. This contributes to the activation of the patient's mental reserve and helps to recover his mental state and physical condition.

We conducted the training of patients with CFS the autogenic training technique by following the recommendations of Lloyd A. R. with minor modifications [8].

The classical technique of autogenic training (AT) is divided into two degrees: the 1st degree, initial (AT-1) and the 2nd degree, the highest (AT-2).

TABLE 1 – The respiratory function parameters in women with chronic fatigue syndrome before and after the rehabilitation intervention

Parameter	The number of women (n = 39)			
	before rehabilitation		after rehabilitation	
	\bar{x}	S	\bar{x}	S
Vital capacity (VC)	3.43	0.75	3.62	0.72
Forced expiratory volume in the first second (FEV ₁)	2.64	0.41	2.93	0.35
Peak expiratory flow rate (PEFR)	6.71	1.39	7.32	1.40
Respiratory frequency (breaths per minute)	18.04	1.95	17.65	1.41

Note: * – the differences between the parameters before and after physical rehabilitation intervention within the group are significant at $p < 0.05$.

Technique of the 1st degree, AT-1.

Before the beginning of the classes, we explained to patients the physiological basis of the AT technique and the expected results. The sessions of self-suggestion were performed two times a day for two months, the duration of the sessions was 15 min. At the first stage, we taught patients a set of 6 exercises:

- the objective of **1st exercise** is to induce the sensation of heaviness in the patient;
- the objective of **2nd exercise** is to induce the sensation of warmth in the patient;
- the **3rd exercise** is focused on controlling heart rhythm;
- the objective of **4th exercise** is to teach the patient control breathing;
- the **5th exercise** is focused on controlling the function of the internal organs via the solar plexus;
- the objective of **6th exercise** is to teach the patient induce the sensation of coolness in the forehead area.

The second level of autogenic training consists of 7 exercises, the purpose of which is to train in their minds various representations about color, about a certain subject, about a certain idea, or about a person, who induces positive emotions in the patient.

The autogenic training technique is one of the effective means of psychotherapeutic influence on patients with CFS. The difficulties of applying the autogenic training technique are related to a necessity to teach a patient and to a long duration of the treatment course with the AT-technique that lasts 8-9 months, moreover, the patient needs to train individually for 6–8 months.

The physical rehabilitation program for patients with CFS was carried out for two months in our study. Considering the need for further

TABLE 2 – The respiratory function parameters in men with CFS before and after the rehabilitation intervention

Parameter	The number of men (n = 27)			
	before rehabilitation		after rehabilitation	
	\bar{x}	S	\bar{x}	S
Vital capacity (VC)	4.75	0.69	4.91	0.71
Forced expiratory volume in the first second (FEV ₁)	3.94	0.61	4.20	0.75
Peak expiratory flow rate (PEFR)	10.03	1.60	10.47	1.46
Respiratory frequency (breaths per minute)	16.47	1.59	14.18	1.32

Note: * – the differences between the parameters before and after physical rehabilitation intervention within the group are significant at $p < 0.05$.

implementation of the rehabilitation program for at least 8–12 months, the rehabilitologist must constantly communicate with patients by phone or other means to increase the motivation to continue the sessions, as well as to monitor their progress.

When evaluating the results of rehabilitation, it is worth noting that the analysis of lung respiratory function results in women with CFS before and after rehabilitation, presented in Table 1, showed improvement in all the studied parameters: the vital capacity (VC) increased, the forced expiratory volume in the first second (FEV₁) increased, the peak expiratory flow rate (PEFR) increased, and the respiratory rate for 1 minute decreased. Despite the fact that there were no statistically significant differences between these parameters ($p > 0.05$), we would like to note that this is due to the short duration of the study and difficulties in corrective influencing the parameters such as vital capacity and respiratory rate.

The respiratory function parameters in men with CFS before and after the rehabilitation intervention are shown in Table 2.

An analysis of the respiratory function parameters in men with CFS, presented in Table 2, showed improvement in all respiratory lung function parameters in men with CFS ($p > 0.05$). Despite the fact that significantly substantial changes were not observed, we obtained an increase in the respiratory function parameters. The obtained results allow us to conclude that this is due to the short duration of the study and difficulties in corrective influencing the parameters such as VC and FEV₁. Furthermore, the results of applying the autogenic training technique confirm the possibility of indirect regulation of the respiratory system activity.

Accordingly, our further studies will be focused on the assessment of the state of the respiratory

system in patients with CFS at later stages of the intervention (after 12 months or more).

Conclusions. The obtained results confirm the positive effect of autogenic training on the functioning of the respiratory system both in men and women. This technique allows to influence the tone of skeletal muscles, by affecting the regulation of respiratory function. A person consciously relaxes the muscles and, then, feels heaviness in the muscles. Conscious

relaxation of muscles and the presence of the above relationship between the central nervous system and muscle tone are realized in the form of the desired effect, which is expected from autogenic training.

As a result of the study we have found that respiratory rate, like muscle tone, is associated with the individual's mentality: rapid breathing improves the mental state, while slow breathing depress the activity of the central nervous system.

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