

**Обоснование принципов нутритивной поддержки в структуре раннего этапа медицинской реабилитации больных с церебральным инсультом.**

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В статье проведен анализ факторов риска, нарушающих трофический статус у больных с острым нарушением мозгового кровообращения. Среди прочих факторов можно выделить сухость слизистой оболочки ротовой полости, желудочно-кишечные расстройства, дегидратация, нарушение функциональных возможностей, страх и депрессия. Анализ пищевых дневников 87 больных выявил что лишь у каждого десятого больного доля удовлетворяемых потребностей в энергии составляла 100%. У остальных больных доля энергетических потребностей удовлетворена менее чем на 75%, что приводит к необходимости назначения дополнительного питания, богатого энергетическими субстратами. Для больных с церебральным инсультом характерны нарушения трофического статуса тяжелой и средней степени, что затрудняет проведение и снижает эффективность реализации физического аспекта восстановительных мероприятий на ранних этапах медицинской реабилитации. При отсутствии соответствующей коррекции симптомов неврологического дефицита и нутритивной поддержки, больной сначала утрачивает простые двигательные способности, а в дальнейшем и самостоятельную социально-бытовую активность.

Ключевые слова: трофический статус, церебральный инсульт, скрининг, ранние этапы медицинской реабилитации, физический аспект, социально-бытовая адаптация.

**Justification of nutritional support in the structure of the early stage medical rehabilitation in patients with cerebral stroke.**

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The article is devoted to the analysis of the risk factors that violate the trophic status in patients with acute stroke. Among the risk factors there were: dry mucous membranes of the oral cavity, gastrointestinal disorders, dehydration, violation of functionality, fear and depression. Analysis of the food diaries of 87 patients showed that only one in ten of the patient's share of satisfied demand for energy was 100%. In the remaining patients the proportion of energy requirements satisfied by less than 75%, It lead to the need for additional power supply, energy-rich substrates. It was characterized for patients with cerebral stroke that disturbances of the trophic

status were of severe and moderate degree. Nutritive insufficiency made it difficult to conduct and reduce the effectiveness of the implementation of the physical aspects of recovery activities in the early stages of rehabilitation.

Keywords: trophic status, cerebral stroke, screening, early stages of medical rehabilitation, physical aspect, social adaptation.

**Introduction.** Cerebral stroke is a complex invalidating disease, in case of which a patient's return to everyday activity depends on an adequate early rehabilitation period. About 10 million of new cases are registered in the world, and 450 thousand – in Russia. Invalidity rate after the stroke reaches 3,2 per 10000 of population thus being the most widespread reasons of initial invalidity. About 55% of patients, who survived to the end of year-3, are not satisfied with their life quality. Only 20% of patients return to work [2, 3, 8]. Nutritional insufficiency is widespread among patients with chronic diseases, who are located in hospital or take ambulatory treatment as well as among those who experience heavy physical strain [1, 4, 6]. From 30 to 60% of patients, received in hospital, already have insufficiency in their diet, and up to 25% of them can suffer from a heavy form of it [10]. Therefore, development and pathogenetic foundation of an optimal personalized method of protein-energetic nutritional support for patients with cerebral stroke at early stages of rehabilitation is an urgent medical-social problem [7].

**Methods and materials.** In order to study features of trophic status, analyze reasons of its disturbance, and develop an optimal method of nutritional support examination of 87 patients (52 women and 35 men) in age of 40-80 years (average  $58,4 \pm 7,8$ ) who suffered cerebral stroke has been undertaken. Diagnosis of cerebral stroke was confirmed according to anamnesis, neurological and general somatic inspection, data of neurovisualization, etc. (according to history of disease). All patients with cerebral insult in acute period, who were located in hospital were exposed to clinical-neurological, general somatic, and laboratory inspection on days 5-14. An important element of examination was evaluation of social-household adaptation and patients' ability to serve themselves with a modified scale Rankin – Oxford scale of social adaptation. Patients were also exposed to evaluation of nutritional risk with NRS 2002 scale [9]. The scale included preliminary screening and its content was narrowed down to four basic questions, specifically: unintentional weight loss and adequacy of food intake during a recent period, current index of body mass (IBM) and severity of disease. If at least one answer was positive, a final screening was implemented, and it included calculation of body mass deficit in percentage, IBM evaluation, analysis of weekly food intake in quantity that satisfies normal needs (from 75% to 0%). In case a patient's score reached 4 and more, we took a more detailed evaluation of a patient's nutritional status that included a detailed collection of life anamnesis and visual inspection of a patient, aimed to reveal all possible factors, leading to nutritional insufficiency. Also, the most probable life conditions of patient before their

hospitalization were considered as well as analysis of weight loss rate, appetite, gastro-intestinal symptoms, fever condition, history of disease, and prescription of medicamental therapy.

In order to reveal expression of nutritional insufficiency we used the following indexes: level of serum albumen (g/l), IBM (kg/m<sup>2</sup>), skin-fat fold above triceps (mm), shoulder circumference (mm). In order to objectify interpretation of the received data, point-based evaluation of nutritional insufficiency expression was used [5].

A meal, taken in the hospital, should have been analyzed from the point of quality and quantity of the consumed nutrients in order to evaluate adequacy of energy, protein, and microelements intake. We should like to underline that actual intake of the offered food is significant in our study. Within neurological hospital a patient is treated with one of three diet options: basic option of standard diet (BOD), spare diet (SD), and basic option of standard diet without sugar (sfBOS). All three rations included the necessary daily amount of protein, carbohydrates, water, vitamins, and microelements. However, obviously, the presented diets did not consider individual features of trophic condition status for each patient. To estimate intake of energy, protein, and fluid protocols of diet accounting and water consumption during 3 days were used [9]. Water balance is no less important characteristic of a person's nutritional status [11]. Patients were also examined in order to reveal possible presence of dehydration or edemas.

Results. Of 87 patients only 13% had IBM within normal limits, in 32,2% of cases body mass deficit was registered (IBM < 18,5 kg/m<sup>2</sup>), and in 54,0% of cases redundant body mass and obesity of 1<sup>st</sup> – 3<sup>rd</sup> degree was registered. For the majority of patients cerebral stroke took place in the pool of middle brain artery – 62,1%, for 33,3% of patients it happened in vertebra-basillary pool, and for 4,5% - in the pool of back brain artery. While studying neurological status we have revealed the following basic symptoms: changes in muscle tone in 81,6% of cases, ataxia in paretic arm – in 80,4% of cases, ataxia in paretic leg – in 82,4% of cases, muscle weakness – in 74,7% , pyramid syndrome – 72,4%.

Among other symptoms patients outlined sleep disturbance (28,8%), sight disturbance (12,6%), disturbance in swallowing function (3,4%), pains of various localization (18,3%), change in mood (62%).

Within the period of rehabilitation examination of patients according to Oxford scale of social disadaptation Rankin, the index equaled  $2,8 \pm 0,9$  points, and it is defined as moderate level of activity loss. Evaluation of nutritional risk according to scale NRS 2002, including preliminary and final screening, resulted in  $3,3 \pm 0,7$  points and is characterized by high risk, a patient requires nutritional therapy in this case. Analysis of nutritional diaries established that in only 11,5% of cases part of the satisfied energy needs equaled 100%, for other patients it was no more than 75%, and it led to necessity of additional nutrition (food, rich in energetic substances and protein, sipping,

possible additional or complete enteral feeding). It was also revealed that 25 to 75% of food, offered to patients during their presence in hospital, was not consumed by them or utilized as garbage. Therefore, hospitalized patients did not receive energy proteins, and microelements in the required quality and quantity. Evaluation of laboratory and anthropometric indexes allows is to reveal degree of nutrition insufficiency. Light degree was established for 13,8% of patients, moderate – for 67,8%, and severe – for 18,4%.

**Conclusion.** Metabolic disorganization that emerges in an organism in result of disease and nutrition insufficiency, can decrease efficiency of treatment and rehabilitation measures, and often, in lack of the corresponding correction of the emerging metabolic disturbance, lead to their complete neutralization [10]. In this regard, patients with cerebral stroke who are received in hospital, should be examined carefully in order to reveal risk of nutrition insufficiency development. Examination process should be regulated by a corresponding action standard with a further development of plan for nutritional support of a patient. In case of the corresponding examination and adequate therapy improvement in clinical result of treatment can be expected as well as decrease in intensiveness of complications, death rate, and treatment cost [10]. Therefore, considering individual characteristics of cerebral stroke flow for each patient, analysis and careful personalized approach towards development of rehabilitation programme, establishing influence of diet disturbance (and their further correction) upon realization of physical rehabilitation programme is necessary. In case the described measures are not undertaken, a patient will gradually lose their mobile abilities, and after a continuous inactivity in bed – intention to recover [10].

Thus, the undertaken research allowed us to determine reasons that disturb trophic status and factors that define it for patients with cerebral stroke. Clear signs of trophic insufficiency were revealed among 86,2% of the studied patients, and it makes its further correction totally necessary.

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**АНКЕТА АВТОРА ЖУРНАЛА  
МЕЖДУНАРОДНЫЙ ЖУРНАЛ ПРИКЛАДНЫХ И ФУНДАМЕНТАЛЬНЫХ  
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