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Clinical and Neurological Aspects of Frailty Syndrome

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ABSTRACT

Frailty syndrome is an age–related pathology characterised by a decrease in physical and functional activity, and a lack of adaptive and therapeutic capabilities of the patient. The study of the features of neurological deficits in patients with senile asthenia is an urgent problem of modern medicine. The article describes the principles of the dynamics of subjective and objective neurological symptoms, cognitive indicators in frailty syndrome and treatment of these patients, as well as issues of prevention and organisation of medical care for this category of persons.

Keywords: Frailty syndrome, endothelial dysfunction, vascular cognitive disorders, functional state of the brain

INTRODUCTION

Ageing is a long-term, irreversible physiological process that occurs at three main levels: biological, psychological, and social. The changes that occur in the body because of the ageing process affect all systems and lead to decreased performance and deterioration of physical and mental functions.

One of the syndromes that significantly influence the course of the ageing process is frailty syndrome (FS). FS is a special condition, characteristic specifically for the elderly and senile age, leading to limited life activity, dependence on others and an increased risk of death [1, 2].

The average prevalence of frailty is 12.9%, and pre-frailty is 48.9%. It is believed that in the absence of adequate treatment and rehabilitation measures, pre-frailty goes into an advanced form within 4-5 years [3,6,7].

The main geriatric syndromes associated with senile asthenia are sarcopenia (age-related decrease in muscle mass and strength), malnutrition (nutrition deficiency and weight loss), cognitive disorders, hypomobility syndrome (restricted movement), forced prolonged stay-in-bed syndrome, falls syndrome, sleep disorder syndrome, etc. [3, 4, 5].

In the structure of senile asthenia, vascular diseases of the brain occupy a significant place.

The clinical and neurological picture of frailty syndrome is characterized by pronounced variability and depends on the stage of the disease. Thus, with pre-frailty, subjective manifestations predominate in the form of mild and moderate cognitive disorders, asthenic-neurotic complaints, headaches, dizziness, and mild coordination disorders.

The existing symptoms reduce the quality of life of patients but do not interfere with their social and everyday adaptation. [6].

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Treatment of frailty is still a problem that is far from being resolved since in most cases it is not possible to influence the steadily progressive nature of the disease and the multimorbidity of this condition. In this regard, the goal of therapy is to improve the quality of life of patients and prevent the development of acute vascular accidents and vascular dementia. The population strategy is aimed at informing the population about risk factors associated with lifestyle and the possibility of their correction. In addition to the correction of modifiable risk factors, the therapeutic complex for senile asthenia includes measures to maintain cerebral blood flow and brain metabolism, and drug correction of individual syndromes and symptoms, aimed at improving the quality of life of patients.

For this reason, preference is given to drugs with a multimodal effect, which is due to the need to influence various parts of the pathogenesis of chronic cerebrovascular insufficiency and forced polypharmacy in patients in this category.

In recent years scientific literature, the need to correct the nutritional and neurological status of patients with senile asthenia syndrome has been discussed. Drugs based on L-Arginine, L-carnitine the action of which inhibits the processes of premature aging due to powerful antioxidant and anti-inflammatory effects.

Purpose of the study: to study the features of neurological and cognitive deficits in preasthenia and asthenia in senile and elderly patients and to evaluate the effectiveness of combination therapy.

MATERIALS AND METHODS

150 patients were examined. Patients were recruited from the internal medicine departments of the TMA clinic between 2021 and 2023.

Patients were selected according to the «Age is not a hindrance» scale, according to which older people with scores of 3 and above are considered more likely to have frailty and pre-frailty.

The patients were divided into 3 groups:

1. Frailty syndrome.
2. Pre-frailty
3. Control.

Patients were assessed for objective and subjective neurological symptoms. For an objective assessment of the symptoms of pre-frailty and frailty, as well as their dynamic changes before and after therapy. We used the following research methods and clinical scales:

MMSE – (Mini-Mental State Examination) - determination of cognitive status. Scale Lawton Instrumental activities of daily living Scale instrumental activity Lawton). FAS scale (Fatigue Assessment Scale - Fatigue rating scale).

Diagnosis of neurological deficit of the disease was carried out based on anamnesis, examination of somatic and neurological status, and CT or MRI of the brain.

Subjective neurological symptoms were assessed using a 5-point scale: 0 – no symptom, 1 – mild, 2 – moderate, 3 – significantly severe, 4 – severe. The maximum total score, reflecting the severity of subjective signs of the disease and neurological disorders on the scale, corresponds to 32 points, absence of symptoms – 0 points.

The severity of each of the objective neurological syndromes (vestibular-cerebellar, pyramidal, extrapyramidal, sensory, and pseudobulbar disorders) was assessed on a 5-point scale, in which: 0 points corresponded to the absence of symptoms, 1 point - mild manifestations, 2 points - moderately expressed manifestations, 3 points – significantly expressed manifestations, 4 points – severe manifestations.

The patient's condition was monitored upon admission to the hospital (before the start of therapy) and at the end of the course of treatment (after 1 month of observation).

Statistical data processing was carried out using the Statistika software package. When describing the research results, quantitative data are presented in the form $M \pm \sigma$, where M is the arithmetic mean, and σ is the standard deviation.

Comparisons between groups at two measurements during the follow-up period were made using the Wilcoxon test. Differences were considered statistically significant at $p<0.05$.

To correct the symptoms of preasthenia and asthenia, we included the drug Tivorel in the basic therapy of patients. The active ingredients of the drug Tivorel: are levocarnitine and arginine hydrochloride. 1 ml of solution contains 20 mg of levocarnitine and 42 mg of arginine hydrochloride. Tivorel was prescribed at a dose of 100 ml intravenously 1 time per day for 15 days, then 2 weeks of oral L-arginine at a dose of 1000 mg per day. The observation period was 1 month.

RESULTS

When analyzing clinical research methods, the following indicators were identified. The age of the patients ranged from 60 to 84 years; the average was 72.2±6.7 years.

There were 25 (58.1%) females, and 18 (41.9%) males (Fig. 1).

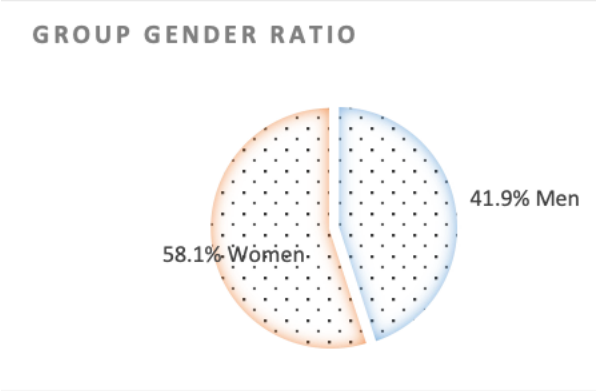


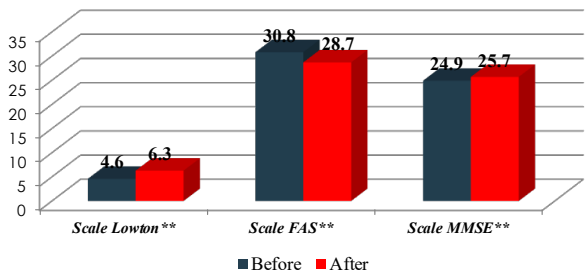
Figure 1. Gender ratio of patients.

About the dynamics of objective neurological syndromes in both stages of frailty syndrome, a statistically significant improvement was achieved in relation to vestibule-cerebellar (p=0.04) and cognitive impairment (p=0.03). The dynamics of the total score of the severity of clinical manifestations reflected a significant decrease in the severity of clinical manifestations with pre-frailty than with frailty.

At the end of the course of treatment, subjectively in patients with frailty, there was a decrease in headaches, dizziness, improvement in memory and mood. Patients with pre-frailty reported decreased dizziness, tinnitus, and fatigue, and improved mood and memory.

The study revealed that patients treated with Tivorel showed significant positive dynamics in the symptom complex of pre-frailty according to the Lawton, FAS scales and cognitive functions according to the MMSE scale (Fig. 2).

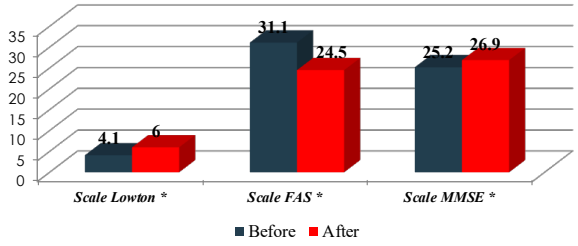
Figure. 2. Dynamics of neurological scale indicators in patients with pre-frailty during treatment with standard therapy.



Note : * - statistically significant differences (Wilcoxon W, p<0.05) between two related samples before and after treatment** - statistically not significant differences (Wilcoxon W, p>0.05) between two related samples before and after treatment

Analysis of the results of treatment with standard basic therapy for patients with senile prefrailty did not reveal significant differences in the results obtained when assessed on the Lawton, FAS and MMSE scales (Fig. 3).

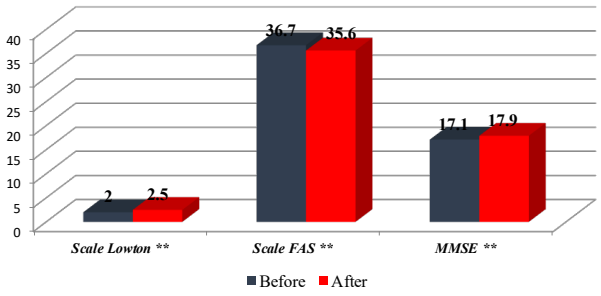
Figure 3. Dynamics of neurological scale indicators in patients with pre-frailty during treatment with Tivorel



Note: * - statistically significant differences (Wilcoxon W, p<0.05) between two related samples before and after treatment. ** - statistically not significant differences (Wilcoxon W, p>0.05) between two related samples before and after treatment

Analysis of the results of treatment of patients with frailty using the drug Tivorel also showed positive dynamics in terms of the Lawton, FAS and MMSE scales. However, these results, due to the predominance of people in the older age group, did not have a statistically significant difference (the average age for patients with pre-frailty was 66.6±7.2 years, with asthenia 72.2±6.7 years) (Fig. 4).

Figure 4. Dynamics of neurological scales in patients with frailty syndrome during treatment with standard therapy

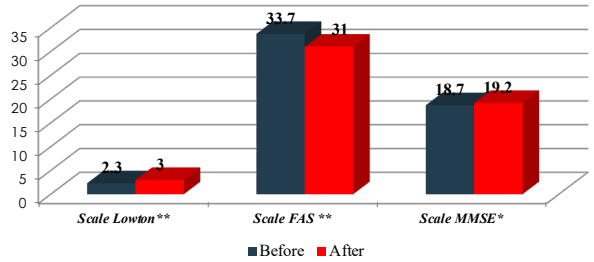


Note :* - statistically significant differences (Wilcoxon W, p<0.05) between two related samples before and after treatment. ** - statistically not significant differences (Wilcoxon W, p>0.05) between two related samples before and after treatment.

Lawton, FAS and MMSE scores both before and after treatment. This indicates the “exhaustion” of the body’s

reserve-compensatory capabilities due to age-related factors (Fig. 5).

Fig 5. Clinical and laboratory parameters of patients with frailty during treatment with Tivorel



Note: * - statistically significant differences (Wilcoxon W, p<0.05) between two related samples before and after treatment. ** - statistically not significant differences (Wilcoxon W, p>0.05) between two related samples before and after treatment.

During observation, no adverse events were identified that required discontinuation of the drug. The results of the study demonstrate that earlier detection of frailty in the pre-frailty stage provides more opportunities for the restoration of clinical and neurological disorders, the high effectiveness of complex treatment using Tivorel in relation to the main neurological syndromes and functional capabilities of the brain in conditions of senile asthenia in elderly patients.

Thus, the results obtained in our study showed the effectiveness and safety of the use of L-arginine and L-carnitine as part of complex therapy in patients with frailty to improve cerebrovascular symptoms. The pleiotropy of the drug makes it possible to classify it as a means of pathogenetically based therapy, and its safety during long-term use makes it possible to consider this drug as a component of continuous multimodal neuroprotection in patients with pre-frailty and frailty syndrome.

CONCLUSIONS

1. The use of Tivorel as part of combination therapy in patients with frailty syndrome leads to a decrease in the severity of both subjective and objective neurological symptoms.

2. The results obtained indicate a beneficial effect of the drug not only on subjective symptoms but also on improving neurocognitive functions in patients with frailty syndrome.

3. Early use of the drug Tivorel in the early stages of the disease increases the effectiveness of treatment.

Consent for publication - The study is valid, and recognition by the organization is not required. The author agrees to open the publication.

Availability of data and material – Available.

Competing interests – No.

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QARILIK ASTENIYASI SINDROMINING KLINIK VA NEVROLOGIK OMILLARI

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Toshkent tibbiyot akademiyasi

ABSTRAKT

Senil asteniya sindromi-bu yoshga bog'liq patologiya bo'lib, u jismoniy va funktsional faollikning pasayishi, bemorning moslashish va tiklanish qobiliyatining etishmasligi bilan tavsiflanadi . Keksa asteniya bilan og'rigan bemorlarda nevrologik etishmovchilikning xususiyatlarini o'rganish zamonaviy tibbiyotning dolzarb muammosidir. Maqolada sub'ektiv va ob'ektiv nevrologik alomatlar dinamikasi, keksalik asteniyasida kognitiv ko'rsatkichlar va geriatrik asteniya bilan og'rigan bemorlarni davolash tamoyillari, shuningdek, ushbu toifadagi shaxslarga tibbiy yordamning oldini olish va tashkil etish masalalari tasvirlangan.

Kalit so'zlar: senil asteniya,geriatriya, endotelial disfunktsiya, qon tomir kognitiv buzilishlar, miyaning funktsional holati.

КЛИНИЧЕСКИЕ И НЕВРОЛОГИЧЕСКИЕ АСПЕКТЫ СИНДРОМА СТАРЧЕСКОЙ АСТЕНИИ

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АБСТРАКТ

Синдром старческой астении – это связанная с возрастом патология, характеризующаяся снижением физической и функциональной активности, дефицитом адаптационных и восстановительных возможностей пациента . Изучение особенностей неврологического дефицита у больных старческой астенией является актуальной проблемой современной медицины. В статье описаны принципы динамика субъективных и объективных неврологических симптомов, когнитивных показателей при старческой астении и лечения больных гериатрической астенией, а также вопросы профилактики и организации медицинской помощи данной категории лиц.

Ключевые слова: старческая астения, гериатрия, эндотелиальная дисфункция, сосудистые когнитивные расстройства, функциональное