

Frailty as the basis for physiotherapeutic procedures for patients aged 65+

Frailty (zespół słabości) jako podstawa postępowania fizjoterapeutycznego wobec pacjentów 65+

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Key words

frailty, weakness syndrome, exhaustion syndrome, the elderly, rehabilitation

Abstract

Introduction: Frailty syndrome (FS) is a condition of functional limitations related to the older age, and its specificity as well as the scale of occurrence justify the need for its description and ordering of knowledge in this area.

Aim: The aim of the literature review is to systematize knowledge in the field of individual descriptive elements of FS and rehabilitation dedicated to FS.

Material and methods: The publication is a review and systematizes research material in the field of frailty syndrome. The narrative review was based on the analysis of publications contained in the Pubmed database and Polish sources published in the period 2012-2017. The sources were selected in accordance with the purpose of the work.

Results: Frailty syndrome is defined in various ways, although the main reference refers to its first description, formulated by L. Fried et al. There are three main phenotypes of the weakness group, classified based on the criteria of the creators of this team. Different scales are used in diagnostics: CHS, FRAIL, ESE, as well as GFI, TFI and PLFI indicators. Frailty syndrome develops on the basis of causes and effects of the so-called cascade of weaknesses, among them, chronic inflammatory processes, sarcopenia and immunological changes are of key importance. Recommended physiotherapy regimens cover various cycles and types of physical activity, with the use of a 12-week programme of exercises of various types.

Conclusions: Frailty is a state of exhaustion of reserves and functional limitations in older age, also referred to as a team of weakness, frailty and fragility. Most reports confirm the use and usefulness of the CHS scale. There is a lack of unambiguous physiotherapy regimens for FS.

Słowa kluczowe

frailty, zespół słabości, zespół wyczerpania rezerw, osoby starsze, rehabilitacja

Streszczenie

Wstęp: Zespół słabości (FS) jest syndromem ograniczeń funkcjonalnych związanych z wiekiem starszym, a jego specyfika, jak i skala występowania, uzasadniają potrzebę jego opisu i uporządkowania wiedzy w tym zakresie

Cel: Celem dokonanego przeglądu literatury jest systematyzacja wiedzy w zakresie poszczególnych elementów opisowych FS oraz rehabilitacji dedykowanej FS.

Materiał i metody: Publikacja ma charakter przeglądowy i dokonuje systematyzacji materiału badawczego w zakresie *frailty syndrome*. Przegląd narracyjny oparto na analizie doniesień opublikowanych w bazie Pubmed w okresie 2012-2017 oraz polskich źródłach wydanych w tym okresie. Dokonano selekcji źródeł zgodnie z celem pracy.

Wyniki: Zespół słabości jest określany i definiowany w różnorodny sposób, choć główne odniesienie odnosi się do pierwszego jego opisu, sformułowanego przez Fried i wsp. Istnieją trzy główne fenotypy zespołu słabości, klasyfikowane w oparciu o kryteria twórców tego zespołu. W diagnostyce stosowane są różne skale: CHS, FRAIL, EFS, a także wskaźniki GFI, TFI i PLFI. Zespół słabości rozwija się w oparciu o przyczyny i skutki wpisane w tzw. kaskadę słabości, a wśród nich kluczowe znaczenie mają przewlekłe procesy zapalne, sarkopenia i zmiany immunologiczne. Rekomendowane schematy fizjoterapii obejmują różnorodne cykle i rodzaje aktywności fizycznej, przy czym najczęściej podkreślana jest przydatność 12-tygodniowego programu ćwiczeń o różnym charakterze.

Wnioski: *Frailty* jest stanem wyczerpania rezerw i ograniczeń funkcjonalnych wieku starszego, określanym też mianem zespołu słabości, kruchości i wątłości. Najwięcej doniesień potwierdza stosowanie i przydatność skali CHS. Brak jednoznacznych schematów postępowania fizjoterapeutycznego w odniesieniu do FS.

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INTRODUCTION

Among the many issues of geriatric care and physiotherapeutic management in recent years, especially in foreign language literature, the process referred to as “frailty syndrome” (FS) is being increasingly exposed. In relation to this subject, significant findings of geriatricians are clearly noticeable, which translate into both the description and presentation of significant factors and effects associated with them¹. There are also preliminary scientific reports allowing for the assessment of the scale of its occurrence, which does not allow its marginalisation or omission in the aspect of aging. Analysis of literature on the subject shows that the identified incidence of FS in the world among various groups ranges from 4.5 to approximately (approx.) 38%²⁻¹³, and in European countries, its prevalence is estimated at about 2.6% to 44%^{12,14,15}. In Polish scientific studies, this subject is addressed to a very limited extent. The analysed sources provide only limited information regarding frailty syndrome in cardiovascular patients (with acute coronary syndrome and heart failure), hospitalised for this reason, because FS is treated as a significant risk factor of adverse disease events and threats to life and health in these patients^{16,17,18}. The results of studies among these patients indicate about 65% to about 83-89% of occurrences in this population^{19,20,21}. In other studies, the verified frequency of FS is 40%²². General reports from Polish literature regarding the incidence of frailty syndrome in Poland indicate a percentage of about 6.7% among older people, but already more than 30% in people aged 75-80 and about 50% in the group of the oldest seniors above the age of 80²³.

Without taking the key aspects related to the occurrence of frailty syndrome among the elderly into account, it is impossible to indicate the principles and objectives of physical therapy in relation to this group, while maintaining certain conditions related to so-called comprehensive geriatric care²⁴. This knowledge should be based on documented facts

about aging processes, among which, the issue of so-called great geriatric pillars should be considered, i.e. burdens and threats typical of old age.

Because this was included in Scottish geriatrics (Bernard Isaacs), they were referred to as the “Five I” based on their English names: *immobility* – reduced neuromuscular activity, *instability* – reduced cardiovascular and endocrine reactivity, *impaired cognition v. intellectual impairment* – progressive reduction of higher nervous function, as well as *incontinence* – impairment of sphincter function, and *iatrogenic diseases* – adverse effects of various drug therapies used in connection with the occurrence of chronic diseases²⁵.

As an important background for the characteristics of FS, facts commonly described in geriatrics related to the heterogeneity of the group of older people (65+) should also be cited. This obviously results from the individual nature of aging processes, genetically and environmentally determined and related to lifestyle. All of these elements, although especially the latter ones, are decisive when considering the specificity of aging processes, co-creating the so-called aging paths, which were distinguished on the basis of the presence of diseases and the degree of preserved physical and mental fitness²⁶. The specificity of the implemented aging ‘track’ determines the extent to which the above changes translate into numerous functional and psychophysical limitations of the elderly, conditioning successful (healthy) or unfavourable (multi-disease) aging, burdened with a high risk of reducing quality of life and faster death. Of course, it is not difficult to assume that the majority of older people age on two unfavourable ‘tracks’, which is also consistent with existing knowledge in the field of gerontology. Healthy aging is treated as a very desirable reference point for optimal human aging and the goal of preventative efforts as well as various therapeutic interventions. Even this, however, is associated with the presence of certain undesirable physiological processes and changes associated with aging, which are inevitable due to general changes

in the vitality and endurance of the human body, which decrease with age (the so-called “slippery slope” of aging)¹.

In gerontological literature, physical activity within this area has been particularly desirable for many years, constituting a specific “antibody to aging” and a factor preventing the rapid development of aging processes^{1,25-28}. The extent of the issues related to FS indicates that it must be treated as one of the restrictions of old age, associated with the occurrence of specific symptoms as a consequence of certain risk factors and the effects of lifestyle. Knowledge on the specificity of this syndrome should be the basis for possible physiotherapeutic activities and the process of rehabilitating seniors, conditioning effectiveness.

STUDY AIM

The aim of the work is to show the current state of knowledge regarding frailty syndrome in the elderly (65+) within the context of its terminology, pathophysiology and possibilities for diagnostics and rehabilitation.

MATERIALS AND METHODS

The work is a review in nature. The narrative review method was chosen. It was used to analyse available sources in order to systematize knowledge about FS and create its synthetic outline. The research materials were publications contained in the Pubmed database, which was searched using the keywords: *frailty, older adults, physical activity, diagnosis frailty syndrome*. The criterion of time limitation was adopted for publications from the last 5 years, i.e. texts published from 2012-2017 in this database were taken into account. As of October 6, 2017, the adopted search criteria resulted in 503 references. After adopting the following criterion, i.e. *free full text*, this number was limited to 212 items. As a result of further selection, 68 bibliographic items were identified, which became the basis for the analysis of the studied issues. The following publications

were also added to this database: available in Polish, also from the last 5 years, i.e. 2012-2017, confirming the state of research and knowledge regarding frailty syndrome in Polish literature on the subject.

RESULTS

A literature query made in the above manner became the basis of this publication and enabled the characterisation of subsequent descriptive aspects of FS in people aged 65+, creating its synthetic image.

Defining frailty syndrome

The commonly used term for this illness in literature is: frailty or frailty syndrome. Both terms refer to weakness, but also fragility, disability, or feebleness. In Polish literature, the equivalent of English frailty is the term ‘weakness syndrome’, based on the basic meaning of the term^{1,29-32}. In addition, however, the authors interchangeably use the term fragility syndrome, which is the term most commonly used in Polish^{16,23,33-41}. Often, both terms are also used interchangeably^{32,42,43}. In addition, this syndrome is also sometimes referred to as the depletion of reserves or weakness syndrome^{23,35,39,43}. It is sometimes simply referred to without the use of the Polish equivalent and using the English term frailty syndrome^{29,30,37}. There is no single valid definition of frailty syndrome in the literature, although most often, different authors cite similar descriptive aspects, named by the first researchers as FS (Fried et al.) who described it for the first time in 2001 and defined it as a “physiological syndrome characterised by reduced reserves and immunity to stressors, resulting from the accumulation of reduced efficiency of various physiological systems, which, in turn, leads to the occurrence of susceptibility to adverse effects”⁴⁴. This definition, quoted directly or altered only in terms of the structure of the statement or paraphrased without substantive changes, is most often cited in both foreign and Polish literature^{35-37,42,45-47}.

In many definitions, the understanding of the term is directly related to the contribution of Fried et al. In isolating this syndrome and creating criteria for its recognition: frailty is a geriatric syndrome operationally defined by Fried et al. as “the presence of slowness, weakness, exhaustion, low physical activity and unintentional weight loss”⁴⁸. The American Geriatric Association defines FS as a physiological syndrome of an aging body, the main determinants of which are: reduced resistance to various types of stressors, reduced adaptive reserves of the body adaptation and reduced physiological reserves, combined with multiorgan disorders and dysfunctions³⁰. In foreign literature, frailty is referred to as “a significant geriatric syndrome that results from a reduction in the reserves of many of the human body systems, which leads to a state of increased susceptibility to stressors”. In addition, it is also described as a factor associated with increased risk of deterioration in human vital functions and the necessary institutionalisation of care for this person, as well as a risk factor for hospitalisation and death^{2,49,50}. The loss of reserves on many levels is emphasized (the multidimensional loss of individual body reserves) as a determinant of FS^{50,51}. In specialist Polish literature, the definitions of this concept come down to similar approaches, which can be confirmed by the following examples:

- “the syndrome is a physiological reduction of reserves and resistance to stressors, which is associated with a decrease in the functioning of many systems”³⁶;
- “it is a widely occurring geriatric factor characterised by physiological reduction of resistance to stressors”³⁸.

The general definitions of FS also highlight the risk factors and effects of its occurrence and emphasize that it is “an exponent of advanced biological age, a significant risk factor for the development of complications in the elderly and those chronically ill”³⁵. In one of the latest compendiums in the field of geriatric physiotherapy, frailty syndrome was placed in a series of subsequent human abil-

ities and skills, reflecting a decrease in physiological fitness with age and aging processes. The aging curve obtained in this way, assuming the form of an inclined plane, took the place of the weakness complex between “fun” and “functioning” and “inefficiency” into account. Frailty syndrome has been described as a condition that requires the help of third parties for simple and complex daily activities, assessed using the ADL (Activities of Daily Living; Katz Scale) and IADL (Instrumental Activities of Daily Living; Lawton Scale)¹. Frailty has also been described in a similar way as a transitional state between efficiency and disability resulting from various interactions on the body of the aging process itself, concomitant diseases and environmental factors⁴³. In defining frailty syndrome as geriatric, the relatively large freedom of terminological approaches is noteworthy, although in all the aspects of specific reduction of the biological reserves of the body as a result of aging are present, and thus, the inability to ensure its function in a homeostatic state. In Polish literature, the concept of fragility syndrome as a synonym of frailty (syndrome) is very common, which can be the basis of many misunderstandings, especially since frailty syndrome may concern people who are far from fragile or weak biological patterns. The freedom to use different terms for FS may indicate the still visible search for the best equivalent in Polish.

Criteria for the distinguishing FS and its pathogenesis

The basic phenotype of frailty syndrome was highlighted by Fried et al., based on their criteria for distinction. In this model, in terms of its phenotype, frailty syndrome occurred when 3 out of 5 features were present:

1. Unintentional weight loss of 4.5 kg over the past year;
2. Subjective feeling of tiredness and exhaustion (three or more days a week);
3. Slowdown, expressed in a min. 20% decrease in walking speed;
4. Weakness in muscle strength (grip strength less than 20%) – less than

10 kg for women and less than 14.5 kg for men;

5. Low level of physical activity (kcal/week) – the lowest 20%; 270 kcal (women), 383 kcal (men)^{1,37}.

In addition to the distinction of frailty syndrome based on the above characteristics, literature also adopted a “threat of weakness syndrome” - “pre-frail”, which occurred when one or 2 of the 5 criteria above were met¹. This condition was also called “intermediate frailty syndrome”³⁶. Similarly – the absence of any of the distinguished factors meant the absence of weakness traits and the lack of risk of its occurrence (non-frail)¹. The features highlighted above have become the basis for isolating the basic phenotype of frailty syndrome associated with impaired physical performance, weakness, reduction of muscle strength and exhaustion²⁹. Scientific reports also brought forward 3 more precise phenotypes of frailty syndrome after applying the basic proposed by Fried et al. described above. This criterion takes mobility as a feature that distinguishes 3 phenotypes of frailty syndrome into account:

- “Non-mobility type” – without mobility, weight loss and exhaustion;
- “Mobility-type frailty” – a set of weaknesses with preserved mobility, but with slowness and exhaustion;
- “Low activity” – weakness syndrome with low, although preserved, physical activity⁶⁵.

As it results from the list of features adopted here for the above basic classification of the weakness phenotype, this classification was created on its basis and made only a distinction within the adopted phenotypic features. The abovementioned definitions of FS, related to multi-organ changes in the functioning of various systems of the human body, also clearly indicate that the pathophysiology of processes leading to the development of frailty syndrome is not homogeneous and single-factor. To the contrary, it is the whole cascade or “spiral of weakness”, which in consequence, cause the development of FS¹. Among the main factors of the

pathogenesis of frailty syndrome we may find: chronic inflammatory processes and coagulation disorders, loss of muscle mass and sarcopenia, immunity changes, endocrine disorders and genetic factors^{1,29,38,41}.

Diagnosis of FS

In the comprehensive diagnosis of frailty syndrome, one of the most commonly used tools is the CHS (Cardiovascular Health Study Scale) scale proposed by Fried et al., in connection with isolation of this syndrome and description of its key features. The scale makes it possible to assess the phenotypic criteria of frailty syndrome adopted by them³⁶. In order for individual features to be accurately described and evaluated for the presence of FS, this involves the use of various detailed indicators that make up this scale:

- Weight loss - based on information obtained from the patient related to his or her self-assessment in this respect (comparative assessment during the year); a loss of more or 5% of body mass during the year was assumed as a result of the difference in weight between the current body mass and body mass in the previous year;
- Fatigue and exhaustion – assessed using the CED-S depression scale (Center for Epidemiologic Studies Depression Scale);
- Muscle weakness – assessed on the basis of handshake strength measurement using a dynamometer taking age and body mass index (BMI) into account;
- Slowdown of gait – determined based on the results of the “Timed Up and Go” test (result 20 seconds and above over a distance of 4.6 meters taking sex and height into account);
- Level of physical activity (kcal/week) - determined using the short version of the MLTAQ questionnaire (Minnesota Leisure Time Activity Questionnaire)^{1,36,37,39}.

Another tool for the diagnosis of frailty syndrome is the EFS (Edmonton Frail Scale), consisting of 10 domains evaluated regarding cogni-

tive function, balance and mobility, mood, functional independence, use of medication, nutrition, pro-health behaviour, social support and quality of life. Additional tools were also used in this scale: to assess cognitive functions: the “clock test”, and to assess balance and mobility: the “Timed Up and Go” test. The questionnaire is completed within 15 minutes. The total maximum score on the scale is 17 points. Values from 0 to 3 corresponded to the lack of frailty syndrome, and values above 9 points - to the most developed forms of frailty syndrome^{37,52}.

Yet another diagnostic tool used in the diagnosis of FS is the Tilburg Frailty Indicator (TFI). This scale consists of 2 parts: one concerning health and the other part related to the main components of frailty syndrome, covering physical, mental and social aspects (15 questions in total). The total TFI score is in the range of 0 to 15 points, with FS being recognised from 5 points and above⁵².

The FS diagnostic tool is also the Groningen Frailty Indicator (GFI). The questionnaire contains 15 questions related to 4 domains: physical, psychological, social and cognitive. It assesses typical aspects for them, such as: mobility, health problems, physical fatigue, physical performance of the senses, mood disorders and depressive symptoms in the psychological domain, as well as emotional isolation in the social domain and the level of cognitive performance. Frailty syndrome is recognised when the number of points obtained is a minimum of 4. The value of this tool has been confirmed in relation to predicting mortality risk, but in relation to cancer patients. It is also used as a tool for screening the assessment of frailty syndrome in cancer patients^{36,52}.

Among the existing tools used in the diagnosis of frailty syndrome, we may find the FRAIL scale recommended by the International Association of Nutrition and Aging. The name of the scale is an acronym for its components: F – fatigue, R – resistance (endurance), A – aerobic (mobility), I – illnesses (occurrence of diseases), L – loss of weight. The scale is based on the subjective assessment of

the respondents in terms of individual indicators. Studies have confirmed the importance of this tool for predicting disability during 3 and 9 years of follow-up and mortality within 9 years of the study^{37,39}.

As a new diagnostic tool in frailty syndrome, Paulson and Lichtenberg proposed the PLFI – Paulson-Lichtenberg Frailty Index, developed on the basis of the Fried weakness phenotype for the HRS (Health and Retirement Study) cohort study. In addition to the 5 basic phenotypic indicators identified for frailty syndrome in order for it to be diagnosed in detail, the PLFI indicator included demographic criteria: age, gender, race, education, income, health self-assessment, marital status, comorbidities together with an indication of their number, level of simple and complex vital activities (according to the ADL and IADL scales), cognitive functions (according to the TICS scale - Telephone Interview for Cognitive Status), assessment of depression symptoms (according to the CESD scale). The creators of this tool found it useful in research on FS and for use in clinical practice. The value of this tool has been recognised as important in gaining broader knowledge on the patient and various spheres of functioning, as well as a predictor of the need for long-term care. The indicator also provided consistent results compared to the basic FS assessment indicators in the studied population, which according to the authors, confirmed its diagnostic value⁵³.

To complement the image of the described problem, we must also mention other scales, such as the CSHA-FI, named after the implemented cohort study (Canadian Study of Health and Aging - Frailty Index)^{36,39}, the Calgary Cardiac and Cognition Scale (CCCS)³⁹, the Frailty Risk Index (FRI)⁵⁴ or the Frail Non-Disabled (FiND) questionnaire⁵⁵.

Rehabilitation in frailty syndrome

The role of effectively planned physical therapy for reversing the effects of frailty syndrome, reducing its symptoms, and prevention is undeni-

able^{1,24,56,57}. In the review of the guidelines in the literature, one can see, inter alia, the recommendations of the ACSM (American College of Sports Medicine) regarding the type of physical activity and specific interactions in this regard. These recommendations specify its dimension up to 30 minutes a day and a cycle 3-5 times a week. It was also considered that 5 days a week, exercises for 60 minutes, for 1 session, were an effective tool for preventing the development of FS as well as improving the physical condition of the elderly with diagnosed FS. At the same time, the more beneficial effects of long-term exercises were highlighted and verified as the optimal pattern, a cycle of 5 hours a week over 12 weeks⁵⁸. The same pattern of physical activity scheduled for 12 weeks was also confirmed in another source as the HOPE (Home-based Older People Exercise) programme that improves mobility of older people and prevents their falls. The programme included strengthening muscle groups responsible for performing basic everyday activities. The results of people before and after the intervention were assessed based on the “Stand Up and Go” test, Bartel score and depression assessment (GDS scale). The results confirmed that a 12-week exercise programme can improve the mobility and functioning of older people with FS⁵⁹.

Numerous studies have confirmed the need to establish thresholds for physical activity to prevent weakness syndrome, especially since the dominant life activity model was associated with a sedentary lifestyle and minimal physical activity, and patients commonly did not meet WHO requirements for the recommended level of physical activity per week (150 minutes)⁶⁰. The Center for Disease Control and Prevention (CDC) has created three possible models of physical activity for the elderly, preventing the negative effects of aging and creating an optimal level of physical activity during the week. The following variants were determined for the total weekly physical activity of the elderly:

- 150 minutes a week - a variant of aerobic activity of moderate intensity (e.g. brisk walking);

- 75 minutes a week – significant intensity (jogging, running);
- Combination of both of the above – combining moderate and significant aerobic intensity¹.

All variants take the need to carry out exercises to strengthen the main muscle groups into account (trunk, hips, abdomen, lower and upper limbs) at least twice a week. The importance of particular types of training was strictly motivated by the specificity of aging processes and the necessary goals to counteract FS. It was emphasized that aerobic endurance training can effectively improve peak oxygen consumption by 10-15%. It was also pointed out that the exercises performed could improve the muscle strength of people with frailty syndrome by even 110%. However, since both types of exercises are closely linked to the determinants of FS, research on their effectiveness should be treated as the most promising⁵⁶.

DISCUSSION

Frailty syndrome is one of the newer terms describing the specific psychophysical state of older people closely related to aging processes that occur in the human body and affect all organs and systems. The relatively recent discovery and description of FS (2001)⁴⁴ also showed that there is not only a lack of full knowledge on it, but there are also visible deficiencies in the sphere of this terming in Polish. The ambiguity of various terms in Polish, treated as synonyms of the English term frailty, possible to use in colloquial language, in relation to the medical and descriptive approaches of this syndrome, causes interpretation problems and creates terminological chaos in this regard. Frailty syndrome is commonly described as fragility syndrome, which creates unnecessary limitations in its perception and can be treated as controversial, especially since, as analysis has shown, many of the phenotypes of this syndrome do not correspond to physical fragility or weakness^{1,29-32}.

The scale of occurrence of frailty syndrome in various populations, reaching even 50% of people age

65+, does not allow to marginalise this problem and makes it necessary to pay special attention to numerous aspects related to it in the sphere of etiology and pathology as well as multilateral interactions regarding causes and effects. Epidemiological reports also confirm the fact that frailty syndrome is more frequent among older people in European populations, although, at the same time, in this area – in Germany – one of the lowest indicators of frailty syndrome has been verified¹². Data on the occurrence of frailty syndrome are not unambiguous, and the obtained results are also largely associated with the adopted methodology for assessment, although it must also be noted that the syndrome is most often evaluated using basic criteria developed by the first authors describing its specificity^{4,8,11}.

Almost two decades have passed since the isolation and description of the frailty syndrome, which meant that knowledge about frailty syndrome and its various aspects is much greater. Knowledge regarding significant risk factors for the development of frailty syndrome has been organised, including not only age markers or co-morbidities, but first and foremost, all the effects of too little or no physical activity and the dominance of a sedentary lifestyle, as well as the effects of improper dietary habits^{1,4,29,31,61,62}. These elements should be placed in the area of broadly understood lifestyle, shaped in everyday manners and life habits, also changing over time, under the influence of various environmental factors, as well as changes in self-awareness of health or the inclusion of health in the hierarchy of other values at the top.

The interest of gerontologists and geriatricians in frailty syndrome was caused by the visible burden on the functioning of the elderly, manifested in the area of specific determinants attributed to this disease. Further influence of the existing features of the syndrome on other diseases and restrictions on the functioning of the elderly was also visible. Aging is not, however, an automatic transition to FS, as evidenced by the differences in the individual fitness of older people, aging according to different ag-

ing ‘tracks’, according to knowledge of them^{1,26}. Optimal, healthy aging excludes the features of FS and does not lead to its development, but the vast majority of people age according to the other two, more or less pathological, aging ‘tracks’. This results in many further consequences, including the development of frailty syndrome, which is usually preceded by the pre-frail state – a threat of FS development.

The FS identification criteria, developed by its creators, have become the most widely adopted and commonly accepted measures of the syndrome^{36,37,39}. At the same time, attempts were made to identify other various methods of its diagnosis, which, however, more or less referred to the criteria proposed by the first researchers of this disease^{17,32,26,39,54,55}. Existing research reports do not provide ultimate results as to the superiority of individual diagnostic tools compared to others. Their comparative value and usefulness remain within the sphere of research. In the search for other diagnostic methods, it was particularly important to strive to develop the simplest possible principles that are easy to implement in the everyday practice of geriatricians or physical therapists. In the most current literature, attention was paid to the great possibilities of using diagnostics in this area for specific parameters, such as creatinine, calcium or CRP or fibrinogen protein levels^{1,38,63-65}. It seems that these suggestions, especially some more than others, could be a valuable supplement to the basic diagnostic methods proposed by Fried et al.⁴⁴, but they should not completely replace them, because for comprehensive assessment of FS, it is necessary to have full evaluation of the functioning of the elderly, measured by basic indicators related to walking and muscle strength. A review of published reports on the types of physical exercises, as well as the mode and time of conducting them for the effects of FS and its occurrence among the elderly shows that the implemented models differ. There is no optimal and standardised physical therapy programme for the elderly with FS⁶⁶⁻⁶⁸.

The variety of proposed interventions in this area and the ambiguity of existing models of physiotherapeutic interaction towards older people with fully developed FS or the state of its initial development (pre-frail) does not facilitate the matter. The differences in approaches are revealed both in the suggested duration of physical exercises, as well as their intensity and specifications^{67,68}. The described physiotherapeutic activities aimed at people diagnosed with frailty syndrome include various interventions: aero-training, resistance as well as strength training⁵⁶. In connection with them, various aspects of the beneficial effects of physical exercises on individual assessment parameters were also shown: muscle strength, body mass composition, ability to maintain balance, decrease in the number of falls, and overall functional ability⁶⁶⁻⁶⁸. In the conducted reviews of literature in the area of the analysed issue, the authors noted the benefits of using various models of physical exercises in combination with proper nutrition and modification of its style, with exercises related to mental fitness and cognitive skills, as well as the implementation of physical therapy as a supplement to the mixed-exercise programme⁶⁷.

CONCLUSIONS

Frailty syndrome is undoubtedly an illness of certain functional restrictions, closely related to age, but not strictly assigned to it. Its effects can be effectively modified and reversed, preventing the development of the features of this syndrome, as well as preventing its formation. The most common FS diagnostic tool is the Cardiovascular Health Study Scale (CHS), proposed by the research team identifying and describing frailty syndrome. Biochemical criteria and other scales can also be used to diagnose frailty syndrome. Frailty syndrome reduces the effectiveness of management in many diseases, especially in diseases of the circulatory and respiratory systems, and affecting other possible complications, as well as the risk of falls among seniors. There

are no unequivocal recommendations in the field of effective physiotherapeutic treatment among people with FS, who are still in the sphere of research. Frailty syndrome, as a reflection of a certain negative state of aging processes with the too low level of knowledge among seniors on the risk factors of its development and the specificity of aging processes, requires targeted and multi-faceted support from healthcare professionals, including geriatricians and physical therapists.

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