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ORIGINAL PAPERS

ASPECTS OF PATIENT MANAGEMENT WITH FRAILTY SYNDROME

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Abstract. *Frailty syndrome, characterized by age-related physiological decline of systems and organs, causes increased vulnerability, increasing the risk of adverse health outcomes. Proactive identification by family physicians of older people at risk of frailty is the first step of evaluation and provides opportunities to intervene to delay functional decline. Annual assessment of patients during integrated preventive consultations includes elements for identifying frailty syndrome. Screening for frailty conducted by the family doctor is the first step in the early diagnosis of frailty. Frail patients are evaluated through a multidisciplinary approach, involving complex and individualized stages for each patient. This multidisciplinary evaluation serves as the basis for developing a personalized treatment plan and for continuous monitoring of the patient.*

Keywords: Frailty syndrome, older, primary care

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Introduction

The Frailty syndrome is a geriatric concept which has variably defined by different societies involved in studying it since 1970's [1]. This clinical concept needs criteria to be able to be highlighted and quantified in research and practice [1]. Frailty syndrome is defined as a clinically particular state characterized by impaired ability of older people to cope with exogenous or endogenous stress and is correlated with disability and co-morbidity [1,2].

The latest report of WHO has shown that by 2021 the life expectancy at birth and healthy life expectancy had rolled back to 2012 levels (71.4 years and 61.9 years, respectively) [3]. The WHO regions most affected were the Region of the Americas and South-East Asia Region (a decrease of about 3 years in life

expectancy and 2.5 years in healthy life expectancy versus 2019). The WHO region least affected was the Western Pacific Region (a decrease of about 0.1 years in life expectancy and 0.2 years in healthy life expectancy versus 2019) [3].

Frailty syndrome, characterized by age-related physiological decline of systems and organs, causes increased vulnerability, increasing the risk of adverse health outcomes [1-3]. Proactive identification by family physicians of older people at risk of frailty is the first step of evaluation and provides opportunities to intervene to delay functional decline [4]. The frailty syndrome, a condition characterized by a decrease in the functional reserves of the elderly, is considered a geriatric concept that is potentially reversible through personalized, multidimensional interventions targeting the triggering factors [5,6]. The reversibility is greater the earlier the intervention is implemented [5-8]. In practice, we use an individualized, dynamic model of frailty syndrome that could explain the different progression of patients with comparable morbidity burden and similar interventions [9].

Frailty syndrome

Currently, frailty syndrome is viewed as an individualized bio-psycho-social model resulting from the balance between resources and the functional deficits of the elderly (figure 1) [1]. Based on this model, interventions are multidimensional, addressing cognitive function, functionality, and various social factors [9,10].

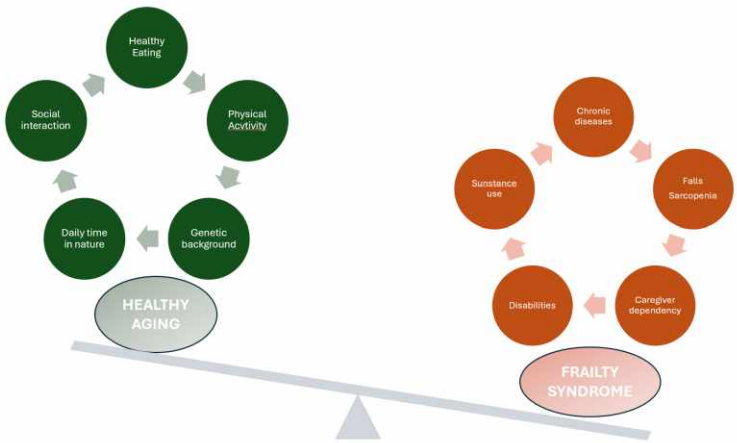

Figure 1. Frailty syndrome – bio-psychological-social model

Frequent components of the biological substratum underlying frailty include:

- Pro-inflammatory state (C-reactive protein, interleukin-6, TNF-α)
- Sarcopenia
- Anemia

- Relative deficiencies in anabolic hormones, such as androgens and growth hormone
- Excessive exposure to catabolic hormones, such as cortisol
- Insulin resistance
- Compromised or altered immune function
- Micronutrient deficiencies
- Oxidative stress [4,9,10].

The Fried Frailty Tool or Frailty Phenotype is one of the most frequently cited physical frailty screening tools [11,12]. It was developed to identify physical frailty in community-dwelling older adults and was initially validated in the Cardiovascular Health Study (CHS), which included over 5,000 men and women aged ≥65 years [11,13-16]. The tool has since been validated in numerous others studies. The Fried Frailty tool requires active patient participation and the specialized personnel and equipment is needed for measuring grip strength and walking speed.

The frailty phenotype is defined as meeting three or more of the following five criteria:

1. Unintentional weight loss (≥4.5 kg or ≥5% of body weight over the past year).
2. Exhaustion (self-reported feelings of fatigue or low energy).
3. Weakness (measured by low grip strength) (Tabel 1).
4. Slow walking speed (gait speed below a defined threshold for age and sex).
5. Low physical activity levels (assessed through self-reported activity levels or validated tools).

This tool remains a cornerstone for frailty assessment in clinical and research settings [17-19].

Tabel 1. Assessment based on gender/BMI/ or age old of handgrip strength [17-19]

	Gender	**BMI (body mass index, Kg/m^2)**	**Handgrip strength (Kg)**	**Age old (years)**	**Handgrip strength (Kg)**
1	Men	≤ 24	≤ 29	60-69	32.9± 8.7
		24,1 ≤ BMI ≤ 26	≤ 30	70-79	32.7± 7.7
		26,1 ≤ BMI≤ 28	≤ 31	>80	23.7± 6.7
		IMC > 28	≤ 32		
2	Women	≤ 23	≤ 17	60-69	21.7± 5.5
		23,1 ≤ BMI ≤ 26	≤ 17,3	70-79	18.2± 5.3
		26,1 ≤ BMI≤ 29	≤ 18	>80	13.9± 5.3
		IMC > 29	≤ 21		

The use of these classification criteria serves as a tool for predicting negative outcomes such as hospitalization, institutionalization, falls, dependency, and mortality.

In this context, frailty is understood as a complex, multidimensional syndrome that intertwines with the aging process. Based on the number of criteria identified, three states of frailty are described (table 2) [20,21].

Tabel 2. Frailty Status (according to Fried criteria) [12,22]:

Frailty Status	**Numer of Fried criteria**
Non-frail	0
Pre-frail	1-2
Frail	≥ 3

The use of a frailty index based on the theory of accumulation of deficits has been proposed, which states that frailty results from a combination of dysfunctions and functional deficits [23]. These deficits have been identified in population studies where a combination of prognostic factors for mortality and institutionalization was selected, and these deficits were included in the Frailty Index [23,24].

The Frailty Index includes deficits identified in areas such as cognitive function, mood, mobility, balance, continence, immune status, daily life activities, and the presence of comorbidities (cardiac, respiratory, urinary, digestive, musculoskeletal) [25].

The Frailty Index is expressed as a ratio between the number of deficits identified and the maximum possible number of deficits. Although challenging to use in practice due to the high number of deficits included (30-70, depending on the version), the Frailty Index remains a reference tool in frailty research [23-25].

Although screening for frailty is necessary, there is currently no validated model for assessing functional status and cognitive deficits in the elderly. Different societies have developed their own screening tools [9,26-29]:

- Prisma 7 (identifying loss of autonomy)
- Edmonton Frail Scale (14 questions used in primary care to evaluate cognition, general health, function, social support, and nutrition)
- Groningen Frailty Index (15 questions used in primary care to evaluate daily activities, psychosocial function, and health issues)
- Clinical Frailty Scale (score from 1- very fit to 9-terminally ill – used in primary care, without specialist training, to evaluate mobility, balance, use of walking aids, and the abilities – how the patient is

capable of independently performing tasks such as bathing, dressing, doing housework, climbing stairs, going out alone, shopping, managing finances, taking medications, and preparing meals)
- Gait Speed Test (4-metre)
- Timed Up-and-Go Test
- 30-Second Chair Stand Test
- 4-Stage Balance Test
- Fried Scale (already mentioned).

In practice, a family physician uses a combination of these tests, depending on the scores obtained from the Fried Scale or mobility, balance, and strength assessments [9].

Identifying risk factors

Risk factors involved in frailty are classified into: unmodifiable risk factors (age, genetic predisposition) and modifiable risk factors (lifestyle, nutrition, level of physical activity, environment, multimorbidity, adherence to treatment) [30-33].

Comprehensive assessment, integrated preventive consultation for the elderly, is a valuable opportunity to evaluate and identify modifiable risk factors for frailty syndrome in primary care. The medical history (table 3), clinical examination, and other elements help in identifying these risk factors. Integrated preventive consultations provide the possibility to apply various assessment tools for nutrition, physical activity, smoking status (current smoker/former smoker/non-smoker), abusive alcohol consumption, sleep duration and quality, and polypharmacy.

Tabel 3. The data that should be collected during medical history [9,20]

•a complete medical and work history
•risk factors for the development of frailty
•symptoms suggestive of the onset of frailty
•symptoms suggestive of the development of complications
•the disease progression (type of onset, subsequent evolution of signs and symptoms)
•the results of previous investigations
•treatment followed
•adherence to the treatment

The frailty assessment encompasses elements of a comprehensive geriatric evaluation, typically conducted by a geriatrician when caring for an elderly patient. This includes evaluating nutritional status, gait and balance, fall risk, mental status, psycho-sensory deficits, medication or substance use, and social factors [34,35].

Tabel 4. Comprehensive Geriatric Assessment tools

ADL – Activities of Daily Living	Questionnaire (score from 6 - independent to 0-very dependent)
IADL – Instrumental Activities of Daily Living	questionnaire (score range from 8 to 0 - women, and from 5 to 0 for men)
MMSE – Mini Mental State Examination	30 items about memory, orientation, registration, calculation, recall and language (score ≤ 23 – cognitive impairment)
MoCA – Montreal Cognitive Assessment	Screening tool for attention, concentration, executive functions, memory, language, calculation, conceptual thinking, orientation (≥ 26, from 30 is normal)
GDS – Geriatric Depression Scale	Self-administrated questionnaire 15 items
MNA – Mini Nutritional Assessment	18 items Score between 17 and 23.5 from 30 – risk for malnutrion <17 – malnourished patiens
TGUG – Timed Get up and Go	Evaluate gait and balance a score of ≥14 seconds – risk of falling
CIRS-G – Cumulative Illness Rating Scale for Geriatrics	a questionnaire administered by the physician a comorbidity score is attributed for each chronic disease
ACE 27	27 items validated comorbidity index for patients with cancer
QLQ-C30	Self-administrated questionnaire 30 items about quality of life
ICOPE Handbook App	It is a digital application that supports the implementation of the Integrated Care for Older People approach, developed by the WHO

Comprehensive Geriatric Assessment is considered the "gold standard" for the assessment and management of frailty (table 4). CGA represents a global,

multidisciplinary evaluation model addressing physical and mental health issues as well as the functional and social status of elderly individuals [35].

Paraclinical investigations

There are studies suggesting that the intrinsic frailty phenotype, expressed through various biomarkers, appears before the expression of the extrinsic phenotype described above [36]. Paraclinical parameters serve as markers for detecting and evaluating malnutrition, inflammation, and oxidative stress in the elderly [36]. Some markers are not specific to frailty and become significant only when multiple markers are associated (the theory of deficit accumulation) [36,37]. Additionally, it is important to distinguish frailty, which has a degree of reversibility, from aging, which is an irreversible process [37,38]. The paraclinical criteria that complete the assessment of the frail patient are presented in Table 5.

Table 5. The paraclinical criteria [36-39]

Used in primary care	Biomarkers use in specialized medical units
•C-reactive protein (CRP) above 10 mg/L •Serum albumin below 35 g/L •Lymphocyte count below 1,200/mm³ •Total cholesterol below 180 mg/dL •Decreased T3 •Decreased 25-OH vitamin D3 •hemoglobin <13 g/dL in men, and <12 g/dL in women •higher ferritin values •higher D-dimer values •higher fibrinogen values	•Prealbumin below 200 mg/L •higher IL-6 •higher TNF-α •higher galectin-3 values •a decrease in the number of initial T and B lymphocytes

Management of patients with Frailty Syndrome

An individualized management plan should be established for each patient. It is crucial to focus on treatment in the pre-frailty stages, including appropriate nutrition, physical activity, and occupational therapy [31,40]. Management plan includes individual cognitive stimulation, memory workshops, games, and group cognitive exercises, mediterranean diet and physical exercise, [31,40, 41]. Setting realistic and personalized goals for each patient is essential. The use of technology and management that integrates various applications and devices can be highly helpful, providing significant benefits, especially in the early stages [41, 42].

Conclusions

Annual assessment of patients during integrated preventive consultations includes elements for identifying frailty syndrome. Screening for frailty conducted by the family doctor is the first step in the early diagnosis of frailty. Frail patients

are evaluated through a multidisciplinary approach, involving complex and individualized stages for each patient. This multidisciplinary evaluation serves as the basis for developing a personalized treatment plan and for continuous monitoring of the patient.

Compliance with Ethics Requirements:

"The author declares no conflict of interest regarding this article "

"The author declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study "

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