



NEED FOR COMPREHENSIVE MANAGEMENT OF FRAILTY AT AN INDIVIDUAL LEVEL: EUROPEAN PERSPECTIVE FROM THE ADVANTAGE JOINT ACTION ON FRAILTY

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Objectives: ADVANTAGE Joint Action is a large collaborative project co-founded by the European Commission and its Member States to build a common understanding of frailty for Member States on which to base a common management approach for older people who are frail or at risk of developing frailty. One of the key objectives of the project is presented in this paper; how to manage frailty at the individual level.

Methods: A systematic review of the literature was conducted, including grey literature and good practices when possible.

Results: The management of frailty should be directed towards comprehensive and holistic treatment in multiple and related fields. Prevention requires a multifaceted approach addressing factors that have resonance across the individual's life course. Comprehensive geriatric assessment to diagnose the condition and plan a personalized multidomain treatment improves outcomes. Multicomponent exercise programmes, adequate protein and vitamin D intake, when insufficient, and reduction in polypharmacy and inadequate prescription, are the most effective strategies found in the literature to manage frailty effectively.

Conclusion: Frailty can be effectively prevented and managed with a multidomain intervention strategy based on comprehensive geriatric assessment.

Key words: frailty; management; prevention; treatment; comprehensive geriatric assessment; ADVANTAGE Joint Action.

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The percentage of European citizens aged over 65 years is predicted to increase from 18% to 28% by 2060. The percentage of people over 80 years of age will increase from 5% to 12% during the same time-period; by 2060 this age group will become as

LAY ABSTRACT

ADVANTAGE Joint Action is a project co-founded by the European Commission and the Member States, with the aim of building a common understanding of frailty on which to base an approach for older people who are frail or at risk. Based on a systematic review of the literature, including grey literature and good practice, where possible, this paper proposes some key interventions to tackle frailty. Prevention should be based on a multifaceted approach, addressing factors that have resonance across the individual's life course. All older people (over 70 years of age) should be offered a screening test and, if positive, referred for diagnosis. The management of frailty must be based on comprehensive geriatric assessment, to enable effective planning. Multicomponent exercise programmes, adequate protein and vitamin D intake, when insufficient, as well as reduction in polypharmacy and inadequate prescription are the most effective strategies to manage frailty.

numerous as young people in 2016 (1). These demographic trends suggest that there will be an increase in age-related disability and dependence, which ultimately will impact not only on the wellbeing of the individuals affected, but also on the sustainability of healthcare systems (2). This implies that there is a need to re-shape healthcare systems in order to better address new public health challenges, particularly the needs of older people, independent of their socioeconomic background. Nevertheless, recent data suggest that this disability trajectory can be changed, providing the opportunity for older adults to live long healthy lives without loss of function (3).

Frailty is a progressive age-related decline in physiological systems, which results in decreased reserves of intrinsic capacity, and which confers extreme vulnerability to stressors and increases the risk of a range of adverse health outcomes (4). As frailty is not an inevitable consequence of ageing, a stronger focus on early screening and diagnosis is needed. The identification of conditions preceding the development of disability is an

essential requisite to its effective prevention. Among these conditions the most important risk factor is frailty (5). Thus, identifying risk factors for frailty, improving the accuracy of diagnosis of frailty and a better knowledge of the factors predicting the evolution from frailty to disability are necessary steps to be addressed.

A systematic review, conducted to estimate the prevalence of frailty in older persons living in the community (6), found that the weighted mean prevalence was 9.9% for frailty and 44.2% for pre-frailty. These findings are consistent with data from the biggest European longitudinal study of ageing, the Survey of Health, Aging and Retirement in Europe (SHARE) (7).

Frailty needs to be adequately assessed and managed because it is important to recognize frailty as a distinct condition independent of ageing, as well as independent of chronic diseases and disability. Frailty is, however, not a disease, but rather a complex syndrome of increased vulnerability, which requires a multidomain and multidisciplinary approach and timely interventions. There are many published papers about management of frailty, but there is a lack of articles with specific recommendations about management of frailty. Several strategies have been recommended, ranging from quite simple screening methods to diagnostic procedures requiring a multi-step approach (8). Successful prevention of frailty requires knowledge about the risk factors, as well as better definitions of risk groups and evidence-based interventions that can be offered earlier and tailored to individual's needs. Preventive interventions targeting age-related conditions should not be restricted to older age, but should be expanded to midlife stage when the "intrinsic capacity" starts to decrease. Frail adults require a proactive, multimodal, coordinated and multi-agency approach delivered in an integrated healthcare system (9).

ADVANTAGE JOINT ACTION

ADVANTAGE is a Joint Action (JA), co-founded by the European Commission under the third European Union (EU) Health Programme 2014–2020, involving 22 Member States and 35 organizations. Partners worked together to summarize the current State of the Art of the different components of frailty and its management, both at a personal and population level, and increase knowledge in the field of frailty, in order to build a common understanding of frailty to be used by the Member States. The final output of the project was planned to be the "Frailty prevention approach", a common European model to tackle frailty and indicate what should be prioritized in the next years at European, national and regional level and on which to base a common management approach of older people who are frail or at risk of developing frailty in the EU. The identification of the

core components of frailty and its management should promote the needed changes in the organization and the implementation of the health and social systems.

ADVANTAGE JA addresses policymakers involved in planning and developing health and social care policies and strategies for older people; health and social care professionals and formal and informal carers, who implement the necessary changes into everyday practice; and frail older people, or those at risk of frailty, as well as the wider EU population (10).

MANAGEMENT OF FRAILITY AT THE INDIVIDUAL LEVEL

In the field of frailty management at individual level, ADVANTAGE JA planned to: (i) review and collect existing literature on 6 topics that contribute to management of frailty at the individual level (Prevention, Clinical management, Nutrition, Physical exercise, Drugs, Information and Communication Technology (ICTs)), (ii) identify and share examples of good practice on these topics in the management of frailty, (iii) collect data from evaluation of interventions to create best practice guidelines on these topics, and (iv) develop a report on the management of frailty at the individual level (10). This paper gives a brief overview of the literature on the 6 mentioned topics with regard to preventing and managing frailty.

Prevention

Distinguishing between robust, pre-frail and frail older people, the literature indicates that prevention should address all groups in a holistic approach. For older people and informal carers, information about accessing preventative strategies and frailty services are received in the context of:

- beliefs that many elements of frailty are an inevitable or unavoidable part of ageing, but that losing your independence is not;
- mixed awareness amongst these audiences of the risks for frailty;
- mixed awareness of the range of available preventative strategies and frailty services;
- attitudinal barriers that older people have to engage with strategies and services (11).

Non-specialist healthcare providers and carers were attuned to the fact that having an independent lifestyle is the greatest motivator for older people in terms of taking action to safeguard their health and wellbeing. Moreover, non-specialist healthcare professionals and informal carers tended to feel strongly that it was their role to support older people in this goal as far as possible. Informal carers were highly conscious of bar-

riers to accessing support among their older relatives, and several reported “taking matters into their own hands” to overcome them (11). Carers often play a significant role in coordinating and managing care of their family members and in facilitating informational continuity (12).

Based on their study, Young et al. (13) concluded that frailty prevention and management call for a multifaceted approach that includes addressing deleterious environmental factors, some of which, like childhood or socioeconomic status, may act across the individual’s life course.

Frailty is viewed as a continuum, preceded by a pre-frail state, where early intervention may delay progression to frailty. Health promotion activities, such as reducing smoking and alcohol consumption, increasing physical activity, and improving diet to achieve and maintain a healthy weight, improve health and reduce the risk of frailty in later life (14).

The results of several studies provide strong evidence that a supervised physical therapy or occupational therapy rehabilitation programme that targets underlying physical impairments can lead to improvements in physical function and a reduction in adverse outcomes, such as frailty among elderly people (15).

Targeted interventions could have a significant impact on preventing the progression of frailty and the negative consequences of frailty. For effective design and evaluation of interventions tailored to address frailty, priority must be placed on achieving a consistent definition of frailty (15).

Clinical management

There are dozens of tools designated to assess frailty, ranging from simple to multicomponent tools (14, 16–23). Furthermore, the gold standard for diagnosing and planning the treatment of frailty status is comprehensive geriatric assessment (CGA) (16). We recommend that all persons older than 70 years attending healthcare services should be screened for frailty. Therefore we propose a range of instruments to use first in a screening phase and, secondly, in a diagnostic one. According to the criteria (more rapid to administrate, does not require special equipment, and validated and used for screening) we recommend use of one of the most relevant: Study of Osteoporotic Fractures Index (SOF), Edmonton Frailty Scale, FRAIL Index, Clinical Frailty Scale, Prisma-7, Sharebroke Postal Questionnaire, Inter-Frail, the Frailty Phenotype, Short Physical Performance Battery (SPPB) or gait speed, depending on the setting and the population in evaluation. When screening is positive we recommend performing CGA to obtain a global assessment of persons and to

diagnose frailty by the use of validated scales, derived from the CGA (Frailty Index of accumulative deficits or Frailty Trait Scale). In case of not meeting these requirements and wide use alone being insufficient for an unconditional recommendation, the most used and validated scale for the diagnosis of frailty is the Frailty Phenotype (24, 25, 26).

Nutrition

Malnutrition, or being at risk of malnutrition, increases the risk of frailty and its consequences (14, 27, 28). Prevalence of malnutrition depends on the setting and criteria used and ranges from 2% to 60% (26, 29–31).

The Mini Nutritional Assessment (MNA) is a well-validated tool with acceptable sensitivity/specificity to be used for screening and assessment of malnutrition and risk of malnutrition (30).

Even without malnutrition, elderly people are prone to lose lean body mass and develop frailty because of decreased physical activity (29) and age-associated sarcopaenia. Relative to normal weight, in overweight elderly subjects (BMI 25–30 kg/m²) there is an increased mortality (32). The Mediterranean diet is associated with lower risk of frailty in both frail and pre-frail patients (28).

Short-term increased protein intake, to at least 1 g/kg body weight daily, improves the fractional synthesis rate of muscle protein in healthy elderly subjects (33). Older people need more protein per meal to maximally stimulate the postprandial myofibrillar synthesis rate (33, 34). Older people with higher protein intake lose lean body mass more slowly, lose less when losing weight, and increase muscle mass more if they increase weight (35).

Vitamin D supplementation may have a positive effect on muscle strength and physical frailty in adults over 65 years of age and in vitamin D deficient subjects (36, 37). In frail elderly patients who are at increased risk of falls and fracture, a minimum serum 25-OH vitamin D level of 75 nmol/l is recommended (36, 38). However in a meta-analysis of randomized clinical trials, the use of supplements that included vitamin D, compared with placebo or no treatment, was not associated with a lower risk of fractures among community-dwelling older adults (39).

Physical activity

Sedentary individuals were found to have significantly increased odds of developing frailty compared with the exercise active group. Furthermore, an important part of the management of frailty at the individual level is physical exercise. Physical activity and exercise has

a role in reversing frailty status: moderate physical activity reduced frailty progression in some age groups (particularly those aged over 65 years) and vigorous activity significantly reduced the trajectory towards frailty. However, mild physical activity was insufficient to slow progression (40).

On the one hand, a systematic review provided evidence that multicomponent exercise programmes (consisting of endurance, flexibility, balance, and resistance training) performed with low intensity, in 30–45 min sessions, 3 times per week during almost 1 month, have a positive effect on functional ability and overall health of frail people, but resistance training alone was more effective in reducing physical and psychosocial deterioration. In addition, exercise seems to be more effective in the earlier stages of frailty compared with the later stages (41). There is also evidence that physical exercise is more useful if combined with a nutritional programme (42).

Strength training can reverse or slow down these processes, even at older age (43). Different training interventions have been shown to increase strength in healthy older adults, as well as in frail individuals. Supervised centre-based interventions seem to be more effective than home-based ones to improve strength in frail older persons (44, 45). An important parameter for strength gain is exercise load, i.e. intensity, usually expressed in % of 1RM. Low exercise load studies less frequently reported strength gains. Siegrist et al. (46) reported no strength gains after a 16-week supervised exercise training programme (1 h/week) with strength and power training, challenging balance and gait training, with low, but increasing, levels of difficulty.

Falls in adults over 65 years old are frequent (47) and cause many injuries (40), leading to impaired mobility and loss of physical fitness. Exercise programmes are effective in reducing falls and fall-related injuries in healthy older persons (40, 42). Improving balance and reducing falls risk is even more important for frail older persons who are already at increased risk of falls and injuries. El-Khoury et al. (40) showed that exercise can reduce risk of falls (including serious falls) for 19% of older women who are already at risk of falls. Similar results (22% reduction) were seen in a study by Lord et al. (48).

Polypharmacy

Older people often have concurrent multiple chronic and acute diseases, which increase in prevalence with ageing. The treatment of these diseases usually requires multiple drugs (49). The expression “polypharmacy” indicates concurrent use of multiple medication items by an individual (50). It has been estimated that more

than 50% of persons aged 65 years or older take 5 or more drugs concomitantly (49, 51). Applying single disease guidelines often increases the treatment burden for older people, and may increase the risk of drug-drug and drug-disease interactions, poor adherence with treatment, and increased risk of adverse drug reactions. These contribute to hospitalizations and high unnecessary costs of medical care (52).

In addition to the number of drugs, prescribing medicines that are either inappropriate or no longer indicated increases adverse drug reactions, drug interactions, hospitalizations and costs of care, and may exacerbate frailty (53). Some authors have suggested that high-risk prescribing may directly aggravate the clinical features of frailty. Reduction in inappropriate medicines can clearly decrease costs and medication side-effects in frail populations (54). There are useful tools to manage inappropriate prescribing and reduce polypharmacy in frail patients; e.g. the Beers, STOPP-START and Laroche criteria (55).

In the frame of ADVANTAGE JA, existing literature on polypharmacy (especially when more than 10 drugs are taken) in older people were reviewed, and guidelines and best practice examples used in the management of polypharmacy in elderly people within different EU Member States were collected and evaluated. These guidelines informed recommendations for a more holistic approach to prescribing and pharmaceutical care for frailty, including the decision support tools and education required to enable generalist clinicians to empower and support people to make informed choices about the benefits or burden of medicines, in order to improve shared decision-making and adherence.

Information and communications technology

Information and communications technology (ICT) is of potential interest to support the challenges of frail older persons and can play an important role in enabling older people to remain independent at home, support caregivers, facilitate remote monitoring and self-management, provide decision support, and improve information sharing and coordination of services. In addition to the general benefits of ICT, it may promote social interaction and communication, physical activity and exercise, nutrition, and support other activities of daily life (54). Evidence indicates that ICT may play an important role in supporting complex care of frail older people in terms of screening, assessment, monitoring, and follow-up (56). While physical activity can prevent frailty, ICTs promoting physical activity and exercise seem to be of particular importance. As well as smart home technologies and other supportive ICTs seem to be an important factor in reducing the level of

frailty among elderly people and have potential benefits regarding their ageing at home. They mainly include assistive technologies (for disabilities, home care, etc.) and monitoring of different data and activities (e.g. fall detection, kinematics, position, physiological data, etc.). Despite the range of potential benefits from the use of ICT for frail older persons, its acceptance and deployment remains problematic.

Comprehensive management of frailty at the individual level

Most of the European, as well as world countries are faced with serious demographic challenge of ageing of their citizens. However, there is a need to emphasize that longevity means absence of disease at an old age. Extension of life expectancy is accompanied by extension of life in disease. Elderly people are faced with a decline in psychophysical abilities. Frailty and disability are common and increasing multidimensional health and social challenge in the EU, which is connected with physical, cognitive and functional decline in ageing populations. Prevalence of frailty and disability increases progressively with age, and it is a main factor in increasing health expense in the elderly population. As the process that leads to frailty and disability can be slowed down, or even completely reversed, it is appropriate for early interventions in multiple fields, such as prevention, clinical management, physical exercise, nutrition, drugs and ICT. The ADVANTAGE JA builds a common understanding of frailty to be used in all EU Member States. Policies should endorse sustainable changes in the health and social systems to address frailty.

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