

EDITORIAL

WHAT IS NEW IN EXERCISE REGIMES FOR FRAIL OLDER PEOPLE - HOW DOES THE ERASMUS VIVIFRIL PROJECT TAKE US FORWARD?

M. IZQUIERDO¹, L. RODRIGUEZ-MAÑAS², A.J. SINCLAIR³ ON BEHALF OF THE VIVIFRIL
INVESTIGATORS GROUP

1. Department of Health Sciences, Public University of Navarra, Navarra, Spain; 2. Department of Geriatrics, University Hospital of Getafe, Madrid, Spain; 3. Diabetes Frail Ltd, Droitwich, UK and University of Aston, Birmingham, UK. Corresponding author: Mikel Izquierdo, PhD, Department of Health Sciences, Public University of Navarra (Navarra) SPAIN, Campus of Tudela, Av. de Tarazona s/n. 31500 Tudela (Navarra) Spain, Tel + 34 948 417876, mikel.izquierdo@gmail.com

Physical activity as an intervention is one of the most important components in the prevention and treatment of frailty. The benefits of physical exercise in improving the functional capacity of frail, older adults have been the focus of considerable recent research (1-4).

Frailty is an age-associated biological syndrome characterized by decreased biological reserves, strongly associated with sarcopaenia, diminished strength, endurance, and reduced physiologic function that increases an individual's vulnerability for developing adverse outcomes like disability, death and hospitalization (5-8). At the same time, frailty is a good predictor of other adverse health events in the short, medium and long term. Its practical relevance relies not only on its value as the main prognostic factor for many of those outcomes but also on the fact that functional level is one of the best indicators of health status in older adults. Accordingly an important conceptual idea for frailty is that the focus should be on functionality and not on the diagnosis of disease when facing older patients.

Physical inactivity is a key factor contributing to the onset of muscle mass and function decline (i.e. sarcopenia), which in turn appears to be a central aspect related to frailty. In view of this, a focus on improvements in function and quality of life may be more beneficial in frail older patients than other targets for intervention (9). Poor health, disability and dependency are not inevitable consequences of ageing. The promotion of a healthy lifestyle, the avoidance of sedentariness, and physical exercise have proven to be effective for frail, older adults, enhance their independency, and probably incur fewer health-related costs. The main interventions that have proven effective to prevent and even reverse the frail state are physical exercise, multidimensional geriatric assessment and intervention on major geriatric syndromes, with emphasis on proper adjustment of medication. Interventions to promote physical activity in the population have been effective in improving mobility and function. Other interventions such as nutritional or pharmacological are inconclusive.

The positive effects of exercise intervention on functional capacity, rate of falls, gait ability, balance, cardiorespiratory and strength performance may be observed more often when multiple physical conditioning components (i.e., strength, endurance, or balance) are included in the exercise intervention

compared with only one type of exercise (1-4, 10-13). Multicomponent exercise programmes, and particularly those including strength training, are the most effective interventions to delay disability and other adverse events (4). Indeed, it has been recently reported that multicomponent exercise training including explosive resistance training improved neuromuscular function and functional outcomes in frail institutionalized nonagenarians after long-term physical restraint (10), as well as in frail multimorbid patients (14). Furthermore, physical exercise administration is relatively free of potential unwanted side effects caused by common medications that are prescribed in patients with multiple comorbidities (14).

Although studies have focused on the benefits of concurrent training on young populations, a limited number have explored or implemented training adaptations in older subjects. The absence of changes in functional or strength outcomes measured in some previous studies suggests that the exercise prescription may not have been carefully adapted to provide a sufficient stimulus for improving not only maximal strength but also the functional capacity and muscle power output performance of frail subjects. Therefore, it would seem relevant to identify and implement good practice in the methods and procedures among different European partners involved in research in physical exercise as a mechanism to promote careful prescription of physical exercise to prevent and manage frailty and related diseases.

With this framework in mind, the European Union has included several initiatives in many of their Programs. This is also the case for the Erasmus initiative, which has been created to support European health systems to handle the challenges of efficient care provision and system reorganisation aimed to meet future needs, related to an ageing society and the search for formulae that improve quality of life. Ageing is one of the greatest social and economic challenges of the 21st century, and according to European Commission data, by 2025 more than 20% of Europeans will be 65 years or over, with a particularly rapid increase in numbers of over-80 years of age. As a consequence, and to obtain European added value, it is worth promoting healthy and dignified ageing by helping countries to make their health systems more efficient to implement pilot programmes that can interact directly with frail older patients, aiming to measure the response to multicomponent sport

JNHA: GERIATRIC SCIENCE

exercise programmes for tackling very late-life disability. The need for agreed and transferable methods is urgent. Individual institutions have tended to adopt solutions that often address only their specific problems, and even though cultural and demographic characteristics may differ, the underlying causes and mechanisms are similar and transferable approaches are expected.

The Vivifrail Project, an EU-funded Project as part of the Erasmus+ program, tries to provide training on how to promote and prescribe physical exercise in older adults. This aim is fully alligned with the Strategy for the Promotion of Health and Quality of Life in the European Union and the recently launched document “WHO World Report on Ageing and Health”, which support the idea that health in older people should be measured in terms of function (and not disease), as function finally determines life expectancy, quality of life, and resources or supports that are needed by different populations (www.vivifrail.com). Accordingly, the objective in older adults is to maintain a level of function that provides the highest degree of autonomy possible. The Vivifrail Project, therefore, focuses on the enhancement of knowledge development, and implementation of good practice, as well as the design of materials that can enable us to define a physical exercise prescription as a way to effectively improve health on older people within their environment, creating synergies among the fields of sport and health and social care services. Vivifrail seeks to promote a greater awareness among health and social care professionals in the European Union of physical multicomponent exercise programmes that combine strength training, balance, and gait for the prevention of falls and frailty in people over 70 years old. This specific approach stimulates several components of physical health and appears to be the most effective way for improving overall physical outcomes among frail older people, as well as preventing disability and other adverse illnesses. The added value of the Vivifrail project stems from the “share and exchange” process in which partners, professionals and staff, are able to learn more from and about their counterparts and their local and regional variations in working with older people that have been shown to be successful. This partnership, with participation of research, education and health stakeholders, acquires added value not only because it brings together representatives of five different European countries, but also because it targets groups that are made up of older people with different habits and lifestyles and these are at the core of the project itself. The professionals that participate will be able to take an active part in the exchange of European experience. It is expected that hospital doctors, general practitioners (GPs), allied health professionals, social care staff, sports and exercise managers, voluntary organisations and nursing home managers will participate. They will acquire additional skills and knowledge related to the benefits of physical exercise for functional capacity, that will promote a healthy lifestyle and an enhanced quality of life for older people. They will meet and interact with other

health and sport professionals in Europe, and also recognize the possibilities for the wider application of training interventions for older people over 70 years, from five different regions in Europe. The Vivifrail project, which hopes to report its findings in late 2016, will identify through a European consensus approach what additional research and knowledge is needed in the area of physical exercise interventions for each European region. It will also provide recommendations on how to develop new integrated systems of monitoring and assessment of these intervention programmes in line with the promotion of strength and endurance training prescription for frail older people. This is an exciting time for clinical scientists who wish to combat the increasingly recognised impact of frailty in our societies.

Acknowledgements: Supported by Vivifrail [Grant 556988-EPP-1-2014-1-ES-SPO-SCP] of the Erasmus+ European Comission Program.

*The Vivifrail consortium comprises the following Organisations Hospital Universitario de Getafe (Leocadio Rodríguez-Mañas PhD, Md and Cristina Alonso-Bouzón PhD, Md)(Getafe, Madrid, Spain); Diabetes Frail (Alan Sinclair, PhD, Md) (London, United Kingdom); University of Ulm, (Andrej Zeyfang, PhD, Md) (Ulm, Germany); Università Cattolica Sacro Cuore (Antonio Sgadari PhD, Md and Roberto Bernabei, PhD, MD) (Rome, Italy); Centre Hospitalier Universitaire de Toulouse (Phillipe Barreto, PhD, MD and Bruno Vellas PhD, MD) (Toulouse, France), Public University of Navarra (Mikel Izquierdo, Phd, Nicolás Martínez-Velilla, PhD, MD and Alvaro Casas-Herrero PhD, MD) (Pamplona, Spain)

References

1. Liu CK, Fielding RA. Exercise as an intervention for frailty. *Clin Geriatr Med* 2011;27:101–110.
2. Freiburger E, Haberle L, Spirduso WW, Rixt Zijlstra GA. Long-term effects of three multicomponent exercise interventions on physical performance and fall-related psychological outcomes in community-dwelling older adults: A randomized controlled trial. *J Am Geriatr Soc* 2012;60:437–446
3. Cadore EL, Rodríguez-Mañas L, Sinclair A, Izquierdo M (2013) Effects of different exercise interventions on risk of falls, gait ability and balance in physically frail older adults. A systematic review. *Rejuvenation Res* 16:105-114
4. Cadore EL, Casas-Herrero A, Zambom-Ferraresi F, Idoate F, Millor N, Gómez M, Rodríguez-Mañas L, Izquierdo M (2013) Multicomponent exercises including muscle power training enhance muscle mass, power output, and functional outcomes in institutionalized frail nonagenarians. *Age (Dordr)* 36:773-785
5. Rodríguez-Mañas L, Fried LP (2015) Frailty in the clinical scenario. *Lancet* 385(9968):e7-9. doi: 10.1016/S0140-6736(14)61595-6. Epub 2014 Nov 6
6. Morley JE, Vellas B, Abellan van Kan G, Anker SD, Bauer JM, Bernabei R, et al. Frailty consensus: A call to action. *J Am Med Dir Assoc*. 2013; 14: 392–397.15
7. Morley JE, Malmstrom TK, Rodríguez-Mañas L, Sinclair AJ (2014) Frailty, sarcopenia and diabetes. *J Am Med Dir Assoc* 15:853–859
8. Morley JE (2011) Frailty: diagnosis and management. *J Nutr Health Aging* 15:667-670
9. Rodríguez-Mañas L, Bayer AJ, Kelly M, Zeyfang A, Izquierdo M, Laosa O, Hardman TC, Sinclair AJ, on behalf of the MID-Frail Consortium (2014) An evaluation of the effectiveness of a multi-modal intervention in frail and pre-frail older people with type 2 diabetes - the MID-Frail study: study protocol for a randomised controlled trial. *Trials* 15:34
10. Cadore EL, Moneo ABB, Mensat MM, Muñoz AR, Casas-Herrero A, Rodríguez-Mañas L, Izquierdo M (2014) Positive effects of resistance training in frail elderly patients with dementia after long-term physical restraint. *Age (Dordr)* 36: 801-811
11. Singh MA (2002) Exercise comes of age: rationale and recommendations for a geriatric exercise prescription. *J Gerontol A Biol Med Sci* 57:M262-282
12. Serra-Rexach JA, Bustamante-Ara N, Hierro Villarán M, González Gil P, Sanz Ibañez MJ, Blanco Sanz N, Ortega Santamarí a V, Gutiérrez Sanz N, Marín Prada AB, Gallardo C, Rodríguez Romo G, Ruiz JR, Lucia A. Short-term, light- to moderate-intensity exercise training improves leg muscle strength in the oldest old: a randomized controlled trial. *J Am Geriatr Soc*. 2011 Apr;59(4):594-602. doi: 10.1111/j.1532-5415.2011.03356.x. Epub 2011 Mar 31.
13. Cadore EL, Izquierdo M (2013) How to simultaneously optimize muscle strength, power, functional capacity, and cardiovascular gains in elderly: an update *Age (Dordr)* 35:2329-2344
14. Cadore EL, Izquierdo M (2015) Exercise interventions in poly pathological aging patients that coexist with diabetes mellitus: improving functional status and quality of life. *Age (Dordr)*. 2015 Jun;37(3):64.