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Editorial

Prevention of falls and their consequences

Falls are a major health problem for older adults and the 5th leading cause for disability among them [1]. Millions of older people fall each year: one out of three older than 65 and half of those older than 85 [2]. Falls are the leading cause of both fatal and nonfatal injuries among older adults, causing severe injuries such as hip fractures, head trauma, and death [3]. Older adults are hospitalized for fall-related injuries five times more often than for injuries from other causes [3]. These fall related injuries can make it difficult to get around or live independently, and they increase the risk of an early death.

The individual dimension of a fall, is often underestimated. Falling is frequently experienced as a transitional event. Both, the experience itself and of life post-falling and in anticipation of falling again have a dreadful meaning. Having a fall in old age often becomes a slippery slope towards dependence. Many people who fall, even if they are not injured, develop a fear of falling. This fear may cause them to limit their activities, which leads to reduced mobility and further loss of physical fitness, and in turn increases their actual risk of falling. And even more, when a fall results in a fracture, in sharp contrast to a clinical orthopedic perspective, in which it is often considered a trivial and simply routine case, from the patient's perspective it is an intensely unpleasant and serious incident that also has severe effects on life as a whole [4,5]; besides, hip fractures incur high costs for the healthcare system [6]. This underlines the need for integrated person centered care of elderly victims of a fall, and even more if a fracture results from the accident².

Undoubtedly falls and fractures present a real and growing risk to older adults' health and independence – and to their very lives. Many can be prevented, and European experts are working to engage health care and aging network professionals, older adults and caregivers in prevention efforts [7]. This joint effort is to be praised and showcased as a fruitful example of multidisciplinary collaboration.

Indeed there is lack of consensus in assessing fall risk profile, and the need for a working group developing operational definitions and diagnostic criteria to assess risk cannot wait. But in the meantime, enough evidence supports an annual screening for the risk of falling [8]. Those apparently in the low-moderate risk group will benefit from participation in evidence based programs [9]. And those with a high-risk profile will benefit from a comprehensive geriatric assessment. These interventions have shown their acceptability to frail individuals, and will have a

significant impact [10], although we must recognize that this is an issue that merits further cost/benefit analysis.

There is an extensive evidence base demonstrating that many falls can be prevented by addressing a wide range of risk factors including individual characteristics such as postural hypotension, osteoarticular chronic conditions, polypharmacy, excessive alcohol use, low levels of physical activity, changes in body composition, sensory impairment loss of mobility and balance control. In the last decade we have learned a lot about the physiological causes behind a fall, and new mechanisms and markers have been identified such as a blunted baro-reflex sensitivity [11], low muscle mass indicated by a low calf circumference [12], use of drugs and particularly central nervous system drugs [13]. We know that the assessment should include the differential diagnosis of syncope, whose cause can be ascertained in 89% of the cases [14]. In this vein, we still lack evidence for other cardiovascular causes contributing as a risk factor for non-syncopal falls, field in which there is still scope for future research [15]. The role of the central nervous system in the regulation of gait and the prevention of falls has been acknowledged. Originally, it was recognized in persons with Parkinson syndrome as a failure in dual tasking [16]. In geriatrics, this syndrome is commonly called “cognitive frailty,” [17] and in neurology “motoric cognitive risk syndrome” (slow gait speed and cognitive complaints) its simplicity makes it an attractive falls risk screening tool for the clinic. [18] From this perspective, gait speed is an interesting screening tool, particularly when combined with a history of previous falls [19]. The physical frailty phenotype, polypharmacy, concomitant cognitive impairment and a history of previous falls, appears to be highly predictive of further falls. These predictors differ from others based on high-risk populations previously published. This stresses the importance of testing screening tools in different populations before implementation [20].

The prevalence of falls and multi-morbidity in older adults is high; and associations exist between falls and a number of chronic conditions. There seems to be a complex interplay between chronic disease and falls, highlighting the need for a person-centered management. While additional study is necessary to corroborate these findings, clinicians may consider multi-morbidity, hypertension, and COPD as particular ‘red flags’ for fall risk [21]. Patients with multiple falls, multimorbidity, and depressive symptoms should also be specifically targeted for prevention [22].

Environmental factors are involved as well, such as inadequate housing, uneven streets and footpaths, besides, the environment in which a fall happens gives us clues about its nature, for example, people who fall outdoors are more likely to be younger, male, and

² Rational for FLS.

less likely to have certain chronic health conditions such as diabetes, dementia, and congestive heart failure when compared to people who fall indoors [23]. Considering the significant environmental contribution to fall and fracture risk, in addition to the individual approach in order to treat specific health conditions; a range of environmental interventions, that have shown to be helpful, should also be considered, and include: education to individuals and health professionals, home visits by health professionals, information and support to reduce hazards in the home, training for municipal service providers, health care workers and housing planners; as well as creating opportunities for safe physical activity through improvements in the physical environment, and community education and engagement about falls prevention and management. Even though most interventions studies have been show effective in community settings [24], given the wide variation on the impact estimates (between 6 and 75% decrease in fall related injuries) this interventions should still be carefully evaluated before a widespread implementation strategy could be recommended.

By means of a systematic strategy, it is possible to improve the prevention of injurious falls, and develop a person centered approach for fall and or fracture victims through the development of combined fracture and fall liaison services. The statement provides the framework, and proposes specific action steps to affect sustained initiatives that reduce falls and fractures among older adults, it must focus as well on the way falling becomes entangled in everyday life, if interventions to manage ‘falls risk’ are to be effective.

Disclosure of interest

The author declares that he has no competing interest.

References

- [1] World Health Organization. The Global Burden of Disease 2004 update; 2008.
- [2] Tromp AM, Pluijm SMF, Smit JH, et al. Fall-risk screening test: a prospective study on predictors for falls in community-dwelling elderly. *J Clin Epidemiol* 2001;54(8):837–44.
- [3] Centers for Disease Control and Prevention, National Center for Injury Prevention and Control. Injury prevention & control: data & statistics (WISQARSTM). Retrieved from <http://www.cdc.gov/injury/wisqars/> [2016, July 15].
- [4] Orive M, Aguirre U, García-Gutiérrez S, Las Hayas C, Bilbao A, González N, et al. Changes in health-related quality of life and activities of daily living after hip fracture because of a fall in elderly patients: a prospective cohort study. *Int J Clin Pract* 2015;69(4):491–500. <http://dx.doi.org/10.1111/ijcp.12527> [Epub 20015 Feb 27].
- [5] Abimanyi-Ochom J, Watts JJ, Borgström F, Nicholson GC, Shore-Lorenti C, Stuart AL, et al. Changes in quality of life associated with fragility fractures: Australian arm of the International Cost and Utility Related to Osteoporotic Fractures Study (AusICUFOS). *Osteoporos Int* 2015;26(6):1781–90.
- [6] Hernlund E, Svedbom A, Ivergård M, Compston J, Cooper C, Stenmark J, et al. Osteoporosis in the European Union: medical management, epidemiology and economic burden. A report prepared in collaboration with the International Osteoporosis Foundation (IOF) and the European Federation of Pharmaceutical Industry Associations (EFPIA). *Arch Osteoporos* 2013;8:136. <http://dx.doi.org/10.1007/s11657-013-0136-1> [PMID: 24113837].
- [7] Blain H, Masud T, Dargent-Molina P, Martin FC, Rosendahl E, Van der Velde N, et al. A comprehensive fracture prevention strategy in older Adults: the European Union Geriatric Medicine Society (EUGMS) Statement. *Aging Clin Exp Res* 2016;28(4):797–803. <http://dx.doi.org/10.1007/s40520-016-0588-4> [Epub 2016 Jun 14].
- [8] Panel on Prevention of Falls in Older Persons, American Geriatrics Society, British Geriatrics Society. Summary of the Updated American Geriatrics Society/British Geriatrics Society clinical practice guideline for prevention of falls in older persons. *J Am Geriatr Soc* 2011;59(1):148–57.
- [9] Blain H, Abecassis F, Adnet PA, Aloméne B, Amoyal M, Bardy B, et al. Living Lab Falls-MACVIA-LR: The falls prevention initiative of the European Innovation Partnership on Active and Healthy Ageing (EIP on AHA) in Languedoc-Roussillon. *Eur Geriatr Med* 2014;5:416–25.
- [10] Hagedorn DK, Holm EA. Compliance and satisfaction with a comprehensive falls intervention programme. *Eur Geriatr Med* 2010;1:348–51.
- [11] Isik M, Cankurtaran M, Yavuz BB, Deniz A, Yavuz B, Halil B, et al. Blunted baroreflex sensitivity: an underestimated cause of falls in the elderly? *Eur Geriatr Med* 2012;3(1):9–13.
- [12] Diaz-Villegas G, Parodi JF, Merino-Taboada A, Perez-Agüero C, Castro-Viacava G, Runzer-Colmenares FM. Calf circumference and risk of falls among Peruvian older adults. *Eur Geriatr Med* 2016 [In press].
- [13] Szczerbińska K, Topór-Mądry R. Association between central nervous system drugs and recurrent falling based on prospective falls registration in nursing homes. *Eur Geriatr Med* 2012;3(2):82–6.
- [14] Wold JFH, Ruiter JH, Cornel JH, Vogels RLC, Jansen RWMM. A multidisciplinary care pathway for the evaluation of falls and syncope in geriatric patients. *Eur Geriatr Med* 2015;6:487–94.
- [15] McCarthy F, Fan CW, Kearney PM, Walsh C, Kenny RA. What is the evidence for cardiovascular disorders as a risk factor for non-syncopal falls? Scope for future research. *Eur Geriatr Med* 2010;1:244–51.
- [16] Kelly VE1, Eusterbrock AJ, Shumway-Cook AA. review of dual-task walking deficits in people with Parkinson’s disease: motor and cognitive contributions, mechanisms, and clinical implications. *Parkinsons Dis* 2012;2012:918719. <http://dx.doi.org/10.1155/2012/918719> [Epub 2011 Oct 27].
- [17] Kelaiditi E, Cesari M, Canevelli M, van Kan GA, Ousset PJ, Gillette-Guyonnet S, et al. Cognitive frailty: rational and definition from an (I.A.N.A./L.A.G.G.) international consensus group. *J Nutr Health Aging* 2013;17(9):726–34. <http://dx.doi.org/10.1007/s12603-013-0367-2>.
- [18] Callisaya ML, Ayers E, Barzilai N, Ferrucci L, Guralnik JM, Lipton RB, et al. Motoric cognitive risk syndrome and falls risk: a multi-center study. *J Alzheimer Dis* 2016 [Epub ahead of print].
- [19] Liang CK, Chou MY, Peng LN, Liao MC, Chu CL, Lin YT, et al. Gait speed and risk assessment for falls among men aged 80 years and older: a prospective cohort study in Taiwan. *Eur Geriatr Med* 2014;5:298–302.
- [20] Bonnerup Vind A, Andersen E, Pedersen KD, Joergensen T, Schwarz P. Who will fall again? Predictors of further falls in one year following an injurious fall. *Eur Geriatr Med* 2011;2:145–9.
- [21] Sibley KM, Voth J, Munce SE, Straus SE, Jaglal SB. Chronic disease and falls in community-dwelling Canadians over 65 years old: a population-based study exploring associations with number and pattern of chronic conditions. *BMC Geriatr* 2014;14:22. <http://dx.doi.org/10.1186/1471-2318-14-22>.
- [22] Tchalla AE, Dufour AB, Trivison TG, Habtemariam D, Iloputaife I, Manor B, et al. Patterns, predictors, and outcomes of falls trajectories in older adults: the mobilize Boston study with 5 years of follow-up. *PLoS One* 2014;9(9):e106363. <http://dx.doi.org/10.1371/journal.pone.0106363>.
- [23] Chippendale T, Gentile PA, James MK, Melnic G. Indoor and outdoor falls among older adult trauma patients: a comparison of patient characteristics, associated factors and outcomes. *Geriatr Gerontol Int* 2016. <http://dx.doi.org/10.1111/ggi.12800> [Epub ahead of print].
- [24] Gillespie LD, Robertson MC, Gillespie WJ, Sherrington C, Gates S, Clemson LM, et al. Interventions for preventing falls in older people living in the community. *Cochrane Database Syst Rev* 2012;9:CD007146. <http://dx.doi.org/10.1002/14651858.CD007146.pub3>.

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