Identifying frailty to prevent the risk of falls in the elderly

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KEY POINTS

Falls in the elderly are responsible for significant morbidity and mortality. Identifying a person's level of frailty means that preventive action can be taken on its determinants in order to reduce the risk of falls. Review of knowledge and possible actions.

The World Health Organization defines *"frailty […] as a progressive age-related regression of physiological systems, which leads to a decrease in the reserves of intrinsic capacities*[1]*, which confers extreme vulnerability to stressors and increases the risk of a range of negative health effects"* [1]. Different epidemiological or clinical scales measure an individual's overall health status on a dynamic spectrum: robustness, pre-frailty, frailty – the later stages signalling an increased risk of entering residential care or death. This concept is of major interest as progression through the stages is avoidable and reversible (by supporting robustness and acting on pre-frailty and frailty) using preventive actions: physical activity, diet, social participation and cohesion. The main determinants are not only age, sex and the presence of chronic diseases; low income or social isolation also play a role [2; 3]. In France, the prevalence of frailty among people aged 55 and over is estimated at between 11% and 12%; it is higher in women and of course increases with age [2].

Falls in the elderly: a public health issue

Falls in the elderly can cause physical and psychological damage and lead to loss of independence. According to data from investigations into home and leisure injuries (*Enquête permanente sur les accidents de la vie courante*, EPAC), 85% of visits to emergency departments for such injuries among people aged 65 and over in 2010 were due to a fall. This proportion increased with age, exceeding 90% in patients aged 85 and over [4]. In 2016, accidental falls accounted for 61% of deaths from home and leisure injuries in people aged over 85 and 46% in people aged 75–84 years [5]. Given that falls lead to significant morbidity and mortality (> 9,300 deaths per year), there is a clear imperative for preventive actions; actions that target intrinsic risk factors such as frailty and cognitive disorders, as well as extrinsic risk factors such as the physical environment.

A link established between frailty and falls

The role played by frailty in fall-risk is an extensively studied subject. However, it should be noted that these studies lack comparability due to methodological differences (measurement of frailty used, follow-up time, study population, inclusion of fall history, etc.), which makes it difficult to summarize the results. However, several recent meta-analyses, based on large national or international cohorts or on ancillary studies conducted between 2001 and 2016, show that frailty significantly increases the risk of falls. Pre-frail and frail subjects are more likely to fall than robust subjects (1.1 to 1.5 times and 1.2 to 2.5 times, respectively) [6-8]. This association is more apparent in men and independent of age. There are more recent prospective population-based cohort studies, carried out in different countries and with relatively long follow-up periods, which confirm these results. For example, one of the most illustrative, the China Health and Retirement Longitudinal Study, carried out in around 4,350 subjects aged 60 and over, found an increased risk of falling in pre-frail and frail subjects after four years of follow-up, regardless of socio-economic characteristics and even comorbidities [9]. Furthermore, since frailty may be associated with a poorer prognosis, it seems appropriate to identify it in elderly subjects who have had a fall. Indeed, retrospective studies based on the medical records of elderly subjects admitted to hospital, mainly for falls, suggest a link between frailty and the risk of readmission for falls, or of returning home with medical assistance, as well as a greater risk of death in the months following the fall, regardless of age and sex [10; 11]. The ChuPADom[2] survey, conducted by Santé publique France among elderly subjects admitted to hospital following a fall, is a prospective multicentre study that should soon provide new information about the prognostic value of frailty.

Prevent frailty to prevent falls

Falls and frailty share common prevention factors: diet, physical activity, maintaining cognitive and sensory functions, avoiding social isolation. In order to reduce the risk of falls and their complications, it therefore seems essential to start by preventing frailty. To this end, Santé publique France carries out actions to monitor and prevent frailty, working alongside other public structures in France (research, social security, retirement, regional health and geriatric health agencies: DREES, CNAV, MSA, CNRACL, Agirc-Arrco, ARS, CNSA) and through European partnerships[3]. In particular, Santé publique France conducts surveys aimed at improving knowledge on frailty and falls, and is developing a new prevention and health promotion programme for adults in mid-life (40–55 years) with a view to reducing the risk of autonomy loss. To improve prevention, frailty must be addressed holistically from mid-life, when intrinsic capacities begin to decline[4]. Physical activity combined with good nutrition, for example, has been shown to be useful in preventing the progression from frailty to dependence [12]. In parallel, brochures and videos on fall prevention have been developed in partnership with social security agencies and widely distributed by Santé publique France[5]. Finally, the French Ministry for Solidarity, Health and Autonomy made public, on 21 February 2022, a three-year plan for the elderly aimed at reducing the number of fatal, disabling and repeat falls[6]. Concrete measures will be rolled out from 2022 to 2025, including the approach of Integrated Care for Older People (ICOPE) *(see figure and article below:* "An integrated care approach for preventing dependency in the elderly"). ■

1. According to the World Health Organization (WHO), intrinsic capacities are the set of physical and mental capacities on which an individual can draw at any time. Functional ability is based on the combination and interaction of an individual's intrinsic capacities with their environment. The WHO has identified six domains of intrinsic capacity: mobility, cognition, vitality, psychosocial, vision and hearing.
2. https://www.santepubliquefrance.fr/maladies-et-traumatismes/traumatismes/chute/documents/enquetes-etudes/chutes-des-personnes-agees-a-domicile.-caracteristiques-des-chuteurs-et-des-circonstances-de-la-chute.-volet-hospitalisation-de-l-enquete-chupadom
3. https://advantageja.eu/index.php?option=com_content&view=article&layout=edit&id=328%22
4. Frailty (pourbienenvieillir.fr)
5. https://www.santepubliquefrance.fr/maladies-et-traumatismes/traumatismes/chute/documents/brochure/bouger-en-toute-serenite-prevenir-les-chutes-dans-la-vie-quotidienne https://www.santepubliquefrance.fr/les-actualites/2019/prevenir-les-chutes-un-dispositif-d-information-pour-le-grand-public-et-les-professionnels La prévention des chutes (pourbienvieillir.fr)
6. https://solidarites-sante.gouv.fr/affaires-sociales/autonomie/article/plan-antichute-des-personnes-agees

CHUPADOM: INVESTIGATING THE CIRCUMSTANCES OF FALLS IN ELDERLY PEOPLE

ChuPADom is a prospective multicentre survey conducted among people aged 65 and over hospitalized following an accidental fall at home. It was conducted in 2018 in seven French hospitals. The first analyses, based on 1,467 subjects, showed that more than half of the patients had already experienced a fall in the preceding 12 months. Nearly 45% of the patients suffered a fracture due to their fall, 26% a wound and 16% a head injury. Five profiles of fallers were established: younger seniors who put themselves at risk and fall from greater heights (5.7%); seniors who fall down the stairs in their house (4.6%); independent seniors who lose their balance and fall from their own height (32.4%); dependent seniors who fall during low-intensity activities (54%); and very elderly people who are limited in everyday activities (3.3%). Using new analyses, ChuPADom will describe sequelae by the initial fall severity and health status of the faller, particularly their level of frailty pre-fall.

REFERENCES

- World Health Organization. *Integrated care for older people: Guidelines on community-level interventions to manage declines in intrinsic capacity.* WHO, 2017: 46 p. Online: https://apps.who.int/iris/handle/10665/258981
- World Health Organization. Integrated care for older people (ICOPE): Implementation framework. Guidance for systems and services. WHO, 2019: 41 p. Online: https://apps.who.int/iris/handle/10665/325669?-locale-attribute=fr&
- Marion J Torres, Gaëlle Pédrono, Annabel Rigou, Laure Carcaillon-Bentata, Nathalie Beltzer, Identifying profiles of people aged 65 and over who fall at home and associated falling-induced injuries: The French ChuPADom study, Injury, 2022. https://doi.org/10.1016/j.injury.2022.02.021

REFERENCES

[1] World Health Organization. World report on ageing and health. Geneva: WHO, 2016: 267 p. Online: https://apps.who.int/iris/rest/bitstreams/835463/retrieve

[2] Perrine A.-L., Le Cossec C., Fuhrman C., Beltzer N., Carcaillon Bentata L. Fragilité et multimorbidité : peut-on utiliser les grandes enquêtes françaises en population pour la production de ces indicateurs? Analyse des données d'ESPS 2012 et HSM 2008 [Frailty and multimorbidity: can major French population surveys be used to produce these indicators? Analysis of data from ESPS 2012 and HSM 2008]. *Bulletin* épidémiologique *hebdomadaire*, 2017, n^{os} 16-17: p. 301-310. Online: http://invs.santepubliquefrance.fr/beh/2017/16-17/2017_16-17_2.html

[3] Vellas B. Agir sur tous les déterminants de la fragilité des personnes âgées [Acting on all the determinants of frailty in the elderly]. *La Santé en action*, 2017, n^{oh}440: p. 4-5. Online: https://www.santepubliquefrance.fr/occitanie/agir-sur-tous-les-determinants-de-la-fragilite-des-personnes-agees-interview

[4] Thélot B. L., Lasbeur L., Pedrono G. La surveillance épidémiologique des chutes chez les personnes âgées [Epidemiological monitoring of falls in the elderly]. *Bulletin épidémiologique hebdomadaire*, 2017, n^{os} 16-17: p. 328-335. Online: http://invs.santepubliquefrance.fr/beh/2017/16-17/2017_16-17_5.html

[5] Ung A., Chatignoux É., Beltzer N. Analyse de la mortalité par accident de la vie courante en France, 2012-2016 [Analysis of mortality due to home and leisure injuries in France, 2012-2016]. *Bulletin* épidémiologique *hebdomadaire*, 2021, n^{o} 16: p. 290-301. Online: http://beh.santepubliquefrance.fr/beh/2021/16/2021_16_2.html

[6] Cheng M. H., Chang S. F. Frailty as a risk factor for falls among community dwelling people: Evidence from a meta-analysis. *Journal of Nursing Scholarship*, 2017, vol. 49, n^{o} 5: p. 529-536. Online: https://pubmed.ncbi.nlm.nih.gov/28755453/

[7] Kojima G. Frailty as a predictor of future falls among community-dwelling older people: A systematic review and meta-analysis. *Journal of the American Medical Directors Association*, 2015, vol. 16, n^{o} 12: p. 1027-1033. Online: https://pubmed.ncbi.nlm.nih.gov/26255098/

[8] Chu W.C., Chang S.F., Ho H.Y. Adverse health effects of frailty: Systematic review and meta-analysis of middle-aged and older adults with implications for evidence-based practice. *Worldviews on evidence-based nursing*, 2021, vol. 18, n^{o} 4: p. 282-289. Online: https://pubmed.ncbi.nlm.nih.gov/34075676/

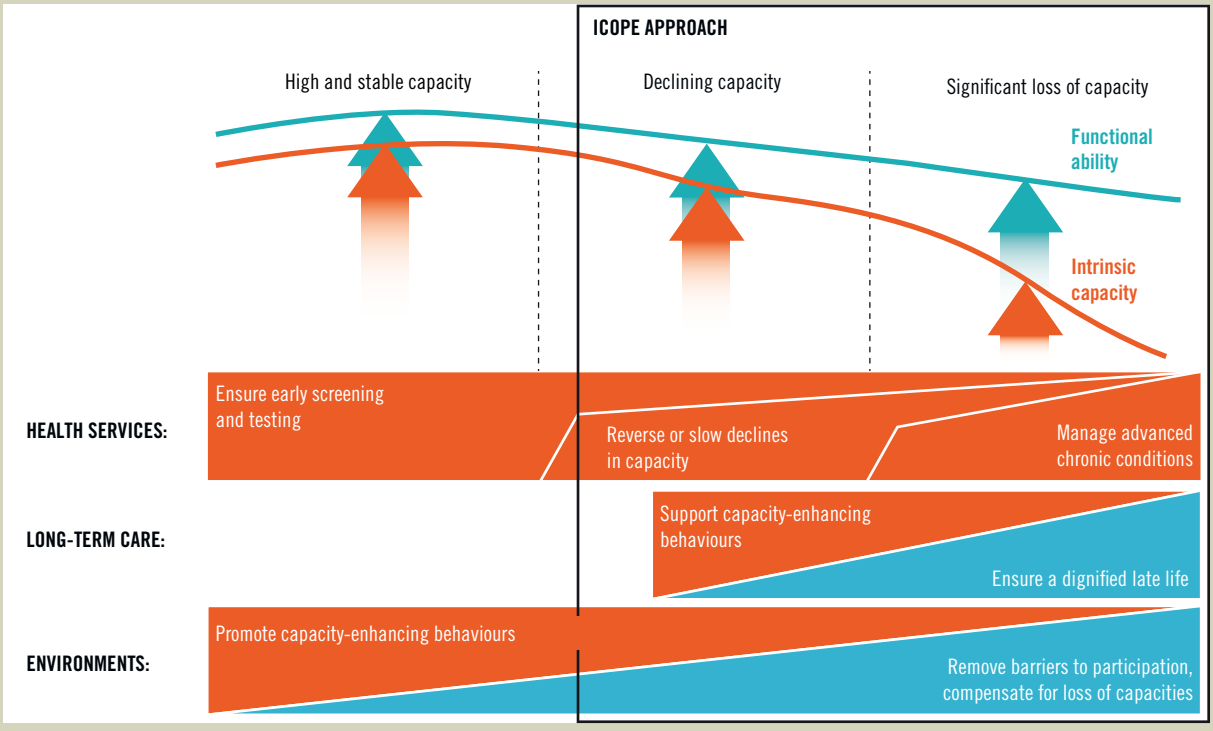
[9] Zhang Q., Zhao X., Liu H., Ding H. Frailty as a predictor of future falls and disability: a four-year follow-up study of Chinese older adults. *BMC Geriatrics*, 2020, vol. 20, n^{o} 1: p. 388. Online: https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-020-01798-z

[10] Pecheva M., Phillips M., Hull P., O'Leary R., Carrothers A.n Queally J. M. The impact of frailty in major trauma in older patients. *Injury*, 2020, vol. 51, n^{o} 7: p. 1536-1542. Online: https://pubmed.ncbi.nlm.nih.gov/32434718/#affiliation-4

[11] Hatcher V. H., Galet C., Lilienthal M., Skeete D. A., Romanowski K. S. Association of clinical frailty scores with hospital readmission for falls after index admission for trauma-related injury. *JAMA Network Open*, 2019, vol. 2, n^{o} 10: e1912409. Online: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6777261/

[12] Gabrovec B. Antoniadou E., Soleymani D., Kadalska E., Carriazo A. M., Samaniego L. L. *et al.* Need for comprehensive management of frailty at an individual level: European perspective from the advantage joint action on frailty. *Journal of Rehabilitation Medicine*, 2020, vol. 52, n^{o} 6: jrm00075. Online: https://pubmed.ncbi.nlm.nih.gov/32399576/

Figure. ICOPE approach: A public health framework for healthy ageing, with opportunities for action at all life stages



Source: World Health Organization 2015(1)

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