

Preparing for the Decade of Healthy Aging (2020-2030): prevention plus therapy?

Domenico Cucinotta

Master of Geriatric Medicine San Marino and Ferrara Universities; past chairman Department of Internal Medicine and Aging, University Hospital, Bologna, Italy; former member IAGG ER Ex Com

The need for action with a focus on evidence-based policies and novel strategies ensuring healthy aging is one of the central priorities discussed within the WHO draft thirteenth general programme of work for 2019–2023 made up to prepare the “Decade of Healthy Aging 2020 -2030”. However, it took time and effort, and it is only thanks to intensive international advocacy “healthy aging” was included into the WHO programme with a statement that “*Ensuring healthy aging is an urgent challenge in all countries*” and a major public health goal is “*to live not just long but also healthy lives*”. “*Healthy life expectancy*” is a main instrument for health care success.

Such goals and measures must be advocated and quoted also at the national and local levels.

WHO highlights the role of primary care and the contribution community health workers can make to keeping older people healthier for longer, and emphasizes the importance of integrating services for different conditions.

People are very interested in learning what they can do to live longer and remain healthy during their later years.

Any model of assessment and management should consider all factors of unhealthy aging: nutrition, cognition, physical activity, hormones, inflammation, affectivity, ecology, social/behavioral factors, and economics (1-3). Lower socioeconomic status is associated with poorer health status, and sudden loss of wealth might be as well (4).

Evidence-based analysis indicate that in successful and healthy aging our mood and overall sense of well-being improve with age, but the majority of aged

people are suffering from chronic diseases, of the burden of multimorbidity, and polypharmacy complexity. Healthy aging interventions are needed to reduce the burden of diseases and protect population on a global level.

Numerous studies have already shown that aging of our bodies is inherently modifiable, and a therapeutic intervention that slows down aging in people is a plausible target for science and public health (5).

Many scientists throughout the world have argued aging should be classified as a disease (6); however, today there are no visible global or national efforts to classifying ageing as a disease and to start clinical trials of care.

A class of products called geroprotectors might be able to delay the onset of concurrent multimorbidity and boost resiliency (7). Over 200 compounds have now been classified as geroprotectors. But various factors are preventing these from reaching the clinic. Rapamycin, metformin, nicotinamide riboside (that increases circulating NAD⁺ in humans and may have potential as a therapy in patients with mitochondrial dysfunction due to genetic and/or acquired diseases.) (8), or senolytics (which remove senescent cells) could slow the development of cataracts, arthritis, osteoporosis, hypertension, cognitive decline, loss of muscle mass etc and can improve functioning, as was demonstrated in animals, by partial reversing aging-related diseases. At the same time, we must bear in mind existing side effects of the above compounds and the absence of a unique algorithm for a comprehensive evaluation of potential geroprotectors in the experiments. And to start a clinical trial one needs specify

an indication, while a clear-cut definition of frailty and comorbidity have to be established by a scientific gerontological community, and in the end accepted by the WHO. And we need simple criteria to defining frailty (9).

The scenario for healthy aging is scientifically based on socioeconomic wealth, timely diagnosis and care of intercurrent illnesses, a good diet, regular physical activity, brain training, and food supplements (peptides, minerals, vitamins, etc). For example, to realize this scenario and improve functions of the aging organism there may be used some peptides which are able not only to penetrate to a cell across a plasma membrane, but also to transport different types of cargo molecules. The peptidergic system could be a functionally relevant complex, consisting of a cell that synthesizes and releases peptides, a cell that responds to that peptide by some change in functioning, and a means whereby the peptide is transferred from its site of synthesis to its site of action. Recent research indicates that specific tripeptides have various effects on the cell. They decrease proliferative activity of immortalized and embryonic cells, but stimulate proliferation of human leukocytes (10). They could have a positive effect on normal cells, but inhibit embryonic and immortalized cells. Another harm of research describes the employment of substances capable to enhance immunomodulating activity in particular (11). The decline in natural killer (NK & NKT) cell function, that may contribute to increased susceptibility to malignancy and infection, was the basis of a recent preliminary trial, carried out with arabinoxylan rice bran, a denatured hemicellulose which showed potential immunomodulatory activity. It had no effect on the total percentage of NK cells, however it enhanced the cytotoxic activity of induced NK cell expression. These data have to be confirmed, but NK cells could be a target for further therapies. The ultimate goal of any biomedical research consists in the development of medications and food supplements with particular consideration of their geroprotective effect. But "*Primum non nocere*" (first, do not harm) remains a basic tenet of medical practice provided for older persons too.

In addition to novel basic biological research, welfare technology seems to be instrumental for improving life quality in older persons and promoting healthy

aging. Welfare technology enables older people to be in contact with other people in an easy way. "*Being in a movement toward becoming a unity as a human being*"; "*Alleviating suffering through beating involuntary solitude*"; "*Being in the world as an equal and dignified human being*" and "*Dedicating new perspectives and meaning in life*" are main issues to combat poor health, depression and loneliness among older adults. Technology will be of great help also in reducing the probability of a medication error, and understanding a possible threat of an age-based stereotype. Finally it may help modulate age-related deteriorations.

The world's health systems aren't ready for older population, but everyone at all levels of health and social care, from front-line providers through to senior leaders, from basic research to advanced gerotech has a role to play to help improve the health of older people, possibly as soon as possible. And Health City Institutes could play an important role in education of people at any age, But very important is the impact of scientific societies on stakeholders. Herewith papers coming from presidents of clinical, social and biological section of the International Association of Gerontology and Geriatrics, European Region, start a new special session of Acta Biomedica, focused on specific problems of older persons.

We too are moving towards healthy aging promotion.

References:

1. Cucinotta D. Prevention of pathological aging by comprehensive clinical, functional, and biological assessment Arch Gerontol Geriatr 2007; Suppl.1: 125-132.
2. Donini ML, Poggiogalle E, Piredda M, Barbagallo M, Cucinotta D, Sergi G. Anorexia and eating patterns in the elderly PLOS one 2013; 8: 5.
3. Bettelli G, Cucinotta D, Neuner B. Introduction: population aging, healthcare systems and surgery. Perioperative Care of the Elderly. Cambridge University Press, 2018; 1-2.
4. Garber AM. From misfortune to mortality: Sudden loss of wealth and increased risk of death. JAMA 2018; 319:1327.
5. Olshansky SJ. Articulating the case for the longevity dividend. Cold Spring Harb Perspect Med 2016; 6: a025940.
6. Zhavoronkov A. and Bhullar B. Classifying aging as a disease in the context of ICD-11. Front Genet 2015; 6: 326.
7. Bellantuono I. Find drugs that delay many diseases of old age. Nature 2018; 554: 293-295.

8. Airhart SE, Shireman LM, Risler LJ, Anderson GD, Nagana Gowda GA, Raftery D, et al. An open-label, non-randomized study of the pharmacokinetics of the nutritional supplement nicotinamide riboside (NR) and its effects on blood NAD⁺ levels in healthy volunteers. *PLoS ONE* 2017; 12(12): e0186459.
9. Barbagallo M, Dominguez LJ, Cucinotta D. The place of frailty and vulnerability in the surgical risk assessment: should we move from complexity to simplicity? *Aging Clin and Exp Res* 2018; 30: 237-239.
10. Khavinson VKh, Nikolsky IS, Butenko GM. Effect of Tripeptides on Lymphoid and Stem Cells. *Bulletin of Exp Biology and Medicine* 2011; 151(6): 722-725.
11. Pérez-Martínez A. Arabinoxylan rice bran (MGN-3/Bio-bran) enhances natural killer cell-mediated cytotoxicity against neuroblastoma in vitro and in vivo. *Cytotherapy* 2015 (17(5): 601-

Received: 22 March 2018

Accepted: 23 March 2018

Correspondence:

Domenico Cucinotta MD, MPH

Master in Geriatric Medicine,

University of Ferrara & San Marino

Cardiologist and Geriatric Consultant

Villa Laura Hospital, Bologna

E-mail: cucin.d@libero.it