

Scoping Review of Biological Age Measurement Composed of Biomarkers

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Abstract : Background: With the increase in life expectancy, aging has been subject of frequent research, and therefore multiple strategies have been proposed to quantify the advance of the years based on the known physiology of human senescence. For several decades, attempts have been made to characterize these changes through the concept of biological age, which aims to integrate, in a measure of time, structural or functional variation through biomarkers in comparison with simple chronological age. The objective of this scoping review is to deepen the updated concept of measuring biological age composed of biomarkers in the general population and to summarize recent evidence to identify gaps and priorities for future research. Methods: A scoping review was conducted according to the five-phase methodology developed by Arksey and O'Malley through a search of five bibliographic databases to February 2021. Original articles were included with no time or language limit that described the biological age composed of at least two biomarkers in those over 18 years of age. Results: 674 articles were identified, of which 105 were evaluated for eligibility and 65 were included with information on the measurement of biological age composed of biomarkers. Articles from 1974 of 15 nationalities were found, most observational studies, in which clinical or paraclinical biomarkers were used, and 11 different methods described for the calculation of the composite biological age were informed. The outcomes reported were the relationship with the same measured biomarkers, specified risk factors, comorbidities, physical or cognitive functionality, and mortality. Conclusions: The concept of biological age composed of biomarkers has evolved since the 1970s and multiple methods of its quantification have been described through the combination of different clinical and paraclinical variables from observational studies. Future research should consider the population characteristics, and the choice of biomarkers against the proposed outcomes to improve the understanding of aging variables to direct effective strategies for a proper approach.

Keywords : biological age, biological aging, aging, senescence, biomarker

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