Q&A: Researcher discusses genetics and biomarkers of frailty thesis

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Frailty is an age-related state of physiological decline and is a strong predictor of disability and mortality. Researchers are trying to improve our understanding of the biology of frailty and to find ways of

identifying frail older adults with the aim to improve individualized management of frailty.

In his thesis, Jonathan Mak, Ph.D. student at the Department of Medical Epidemiology and Biostatistics, provides novel insights into the biological mechanisms of frailty, suggesting that both genetic and environmental factors play important roles in frailty development, with chronic inflammation as the key underlying mechanism.

The studies included span from exploring genetic and environmental influences on frailty in twins to conducting epigenome-wide analyses and investigating metabolic biomarkers.

What are the most important results in your thesis?

Our findings highlight the multifaceted nature of frailty, showing that both genetic and environmental factors, particularly chronic inflammation, contribute significantly to frailty development. We also developed an electronic frailty index (eFI) using electronic health records from 18,225 geriatric patients in Stockholm and we believe that the eFI is a promising tool that can potentially be incorporated in the Swedish health system for routine frailty screening.

Why did you become interested in this topic?

Before my Ph.D., I had never come across the term frailty. But after some discussions with my amazing supervisor, Juulia Jylhävä, and recognizing its importance in the aging population, I became fascinated by this topic. If we can understand why some individuals experience greater frailty in old age compared to others, we may have the potential to prevent it and enhance quality of life during the later years.

What do you think should be done in future research?

I believe leveraging big data analytics and multi-omics approaches will be crucial in the coming years to continue in unraveling the complex biology underlying frailty and aging. Additionally, much more work needs to be done to achieve the goal of personalized care for frail older adults. For example, intervention studies are warranted to confirm whether targeting inflammation can help prevent or reduce frailty. Future studies also need to evaluate if our developed eFI can actually guide clinical decision and ultimately improve patients outcomes when implemented in health care systems.

More information: Genetics and biomarkers of frailty: towards individualized management of the frailty syndrome. openarchive.ki.se/xmlui/handle/10616/48773

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