

Healthy lifestyle may buffer against stress-related cell aging, study says

July 29 2014

A new study from UC San Francisco is the first to show that while the impact of life's stressors accumulate overtime and accelerate cellular aging, these negative effects may be reduced by maintaining a healthy diet, exercising and sleeping well.

"The study participants who exercised, slept well and ate well had less telomere shortening than the ones who didn't maintain [healthy lifestyles](#), even when they had similar levels of stress," said lead author Eli Puterman, PhD, assistant professor in the department of psychiatry at UCSF. "It's very important that we promote healthy living, especially under circumstances of typical experiences of life stressors like death, caregiving and job loss."

The paper will be published in *Molecular Psychiatry*, a peer-reviewed science journal by Nature Publishing Group.

Telomeres are the protective caps at the ends of chromosomes that affect how quickly cells age. They are combinations of DNA and proteins that protect the ends of chromosomes and help them remain stable. As they become shorter, and as their structural integrity weakens, the cells age and die quicker. Telomeres also get shorter with age.

In the study, researchers examined three healthy behaviors –physical activity, dietary intake and sleep quality – over the course of one year in 239 post-menopausal, non-smoking women. The women provided blood samples at the beginning and end of the year for telomere measurement

and reported on stressful events that occurred during those 12 months. In women who engaged in lower levels of healthy behaviors, there was a significantly greater decline in telomere length in their immune cells for every major life stressor that occurred during the year. Yet women who maintained active lifestyles, healthy diets, and good quality sleep appeared protected when exposed to stress – accumulated life stressors did not appear to lead to greater shortening.

"This is the first study that supports the idea, at least observationally, that [stressful events](#) can accelerate immune cell aging in adults, even in the short period of one year. Exciting, though, is that these results further suggest that keeping active, and eating and sleeping well during periods of high stress are particularly important to attenuate the accelerated aging of our [immune cells](#)," said Puterman.

In recent years, shorter telomeres have become associated with a broad range of aging-related diseases, including stroke, vascular dementia, cardiovascular disease, obesity, osteoporosis diabetes, and many forms of cancer.

Research on telomeres, and the enzyme that makes them, telomerase, was pioneered by three Americans, including UCSF molecular biologist and co-author Elizabeth Blackburn, PhD. Blackburn co-discovered the telomerase enzyme in 1985. The scientists received the Nobel Prize in Physiology or Medicine in 2009 for their work.

"These new results are exciting yet observational at this point. They do provide the impetus to move forward with interventions to modify lifestyle in those experiencing a lot of stress, to test whether telomere attrition can truly be slowed," said Blackburn.

Provided by University of California, San Francisco

Citation: Healthy lifestyle may buffer against stress-related cell aging, study says (2014, July 29) retrieved 20 March 2024 from <https://medicalxpress.com/news/2014-07-healthy-lifestyle-buffer-stress-related-cell.html>

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