

Health News from 3Care Therapeutics

Omega-3 May Slow Biological Aging

Researchers from the University of California, San Francisco looked at the length of telomeres, DNA sequences at the end of chromosomes that shorten as cells replicate and age.

The ageing and lifespan of normal, healthy cells are linked to the so-called telomerase shortening mechanism, which limits cells to a fixed number of divisions. During cell replication, the telomeres function by ensuring the cell's chromosomes do not fuse with each other or rearrange, which can lead to cancer. Elizabeth Blackburn, a telomere pioneer at the University of California San Francisco, likened telomeres to the ends of shoelaces, without which the lace would unravel.

With each replication the telomeres shorten, and when the telomeres are totally consumed, the cells are destroyed (apoptosis). Previous studies have also reported that telomeres are highly susceptible to oxidative stress. Some experts have noted that telomere length may be a marker of biological ageing.

“Among patients with stable coronary artery disease, there was an inverse relationship between baseline blood levels of marine omega-3 fatty acids and the rate of telomere shortening over 5 years. These findings raise the possibility that omega-3 fatty acids may protect against cellular aging in patients with coronary heart disease.”

Dr. Ramin Farzaneh-Far

The research adds to a large body of science supporting the potential health benefits of omega-3 fatty acids, particularly in relation to heart health.

Study details

Several studies have shown increased survival rates among individuals with high dietary intake of marine omega-3 fatty acids and established cardiovascular disease. The mechanisms underlying this protective effect are not well understood, according to background information in the article.

The UCSF researchers looked at telomere length in blood cells of 608 outpatients with stable coronary artery disease. The length of telomeres was measured in leukocytes at the start of the study and again after 5 years. Comparing levels of omega-3 fatty acids, EPA and DHA with subsequent change in telomere length, the researchers found that individuals with the lowest average levels of DHA and EPA experienced the most rapid rate of telomere shortening, while people with the highest average blood levels experienced the slowest rate of telomere shortening.

“Each 1-standard deviation increase in omega-3 levels was associated with a 32 per cent reduction in the odds of telomere shortening,” wrote the authors.

Commenting on the potential mechanism, Dr Farzaneh-Far and his co-workers noted that this may be linked to oxidative stress, known to drive telomere shortening. Omega-3 fatty acids have been shown to reduce levels of F2-isoprostanes, a marker of systemic oxidative stress, as well as increasing levels of the antioxidant enzymes catalase and superoxide dismutase, thereby reducing oxidative stress. Another possible mechanism may involve the enzyme telomerase. The enzyme works to maintain telomere length, and omega-3 may increase its activity.

Multivitamins and green tea, too?

The work of the UCSF scientists was limited to people with CHD, thereby limiting how general the results may be. Other studies in healthy people have already linked specific nutrients to telomere length, and subsequently a younger 'biological age'.

Recently, researchers from the US National Institute of Environmental Health Sciences reported that telomere length was longer in regular multivitamin users in their cohort of 586 women aged between 35 and 74. The subjects did not have coronary heart disease. Writing in the *American Journal of Clinical Nutrition*, the US-based researchers noted that theirs was the "first epidemiologic study of multivitamin use and telomere length. "Regular multivitamin users tend to follow a healthy lifestyle and have a higher intake of micronutrients, which sometimes makes it difficult to interpret epidemiologic observations on multivitamin use," they said.

An association between green tea drinkers and telomere length was also reported by scientists from the Chinese University of Hong Kong last year. The telomeres of people who drank an average of three cups of tea per day were about 4.6 kilobases longer than people who drank an average of a quarter of a cup a day, reported the researchers in the *British Journal of Nutrition*.. This average difference in the telomere length corresponds to "approximately a difference of 5 years of life", wrote the researchers, led by Ruth Chan. Dr Chan told NutraIngredients in August 2009 that "Chinese tea" in their study refers to both black and green tea, but added: "Our data showed that majority of Chinese tea consumed by our subjects were of green tea".

Source: *Journal of the American Medical Association*

2010, Volume 303, Issue 3, Pages 250-257 "Association of Marine Omega-3 Fatty Acid Levels With Telomeric Aging in Patients With Coronary Heart Disease" Authors: R. Farzaneh-Far, J. Lin, E.S. Epel, W.S. Harris; Elizabeth H. Blackburn; Mary A. Whooley

Volume #22 January 24, 2010 3Care Therapeutics