

The cells of multivitamin users may have a younger biological age than cells from non-users, according to new research from the US.

Researchers led by Honglei Chen, MD, PhD from National Institute of Environmental Health Sciences 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.

Dr Chen and his co-workers noted that telomere length may therefore be a marker of biological ageing, and that multivitamins may beneficially affect telomere length via modulation of oxidative stress and chronic inflammation.

According to results published in the new issue of the American Journal of Clinical Nutrition, the telomeres of daily multivitamin users may be on average 5.1 per cent longer than in non-users.

"To our knowledge, this was the first epidemiologic study of multivitamin use and telomere length," wrote Dr Chen and his co-workers. "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.

"Further investigations would be needed to understand the role of multivitamin use and telomere length and its implication in the etiology of chronic diseases."

### Multivitamin use

According to a National Institutes of Health (NIH) State-of-the-Science Panel, half of the American population routinely use dietary supplements, with their annual spend estimated at over \$20 billion.

Recent results of the National Health and Nutrition Examination Survey showed that 35 per cent of the US adult population regularly consumes one or more types of multivitamin product (Am. J. Epidemiol., 2004, Vol. 160, Pages 339-349).

### New study

Dr Chen and his co-workers analysed multivitamin use and nutrient intakes, as well as telomere

length of 586 women aged between 35 and 74 in the Sister Study. A 146-item food-frequency questionnaire was used to determine multivitamin use and nutrient intakes.

Compared to non-multivitamin users, the researchers noted that that telomeres were on average 5.1 per cent longer for daily multivitamin users.

In an attempt to identify specific nutrients that could be behind the observations, a positive relationship between telomere length and intakes of vitamins C and E from foods was observed.

"Whereas the evidence is not sufficient to conclude that these 2 dietary antioxidants mediated the observed relation, the results are consistent with experimental findings that vitamins C and E protect telomeres in vitro," wrote the researchers.

Being the first study to report such an association, Dr Chen and his co-workers emphasized that the evidence is only preliminary and that additional epidemiologic studies are required to further explore the association. The implications of the findings in terms of ageing and the etiology of chronic diseases should be carefully evaluated.

Source: American Journal of Clinical Nutrition

June 2009, Volume 89, Number 6, Pages 1857-1863, doi:10.3945/ajcn.2008.26986

"Multivitamin use and telomere length in women"

Authors: Q. Xu, C.G. Parks, L.A. DeRoo, R.M. Cawthon, D.P. Sandler, H. Chen