

Connection Found Between Inactive Lifestyles And Accelerated Aging

Those who are physically active in their leisure time seem to be younger than those with inactive lifestyles, from a biological perspective.

Generally, people who participate in regular exercise already have lower rates of cardiovascular disease, type 2 diabetes, cancer, high blood pressure, obesity, and osteoporosis. However, according to a report in the January 28 issue of *Archives of Internal Medicine*, one of the JAMA/Archives journals, there might be more to this than just avoiding these diseases. "A sedentary lifestyle increases the propensity to aging-related disease and premature death," the authors write. "Inactivity may diminish life expectancy not only by predisposing to aging-related diseases but also because it may influence the aging process itself."

A group of 2,401 white twins was studied by Lynn F. Cherkas, Ph.D., of King's College London, and colleagues. The team administered questionnaires related to physical activity level, smoking habits, and social and economic factors. Notably, the participants also provided a blood sample, and DNA was extracted from the white blood cells (leukocytes.)

The leukocyte DNA samples were analyzed for the length of their repeating sequences at each end of the chromosomes. These sequences, called telomeres, may serve as a marker of biological age, as they progressively shorten over time.

As expected, telomere length decreased with age, contributing to an average loss of 21 nucleotides (the basic structural units of DNA) per year. Less physically active men and women displayed shorter leukocyte telomeres than those who were more active in their leisure time. Even after normalizing for various factors, this trend remained. "Such a relationship between leukocyte telomere length and physical activity level remained significant after adjustment for body mass index, smoking, socioeconomic status and physical activity at work," observe the authors. "The mean difference in leukocyte telomere length between the most active [who performed an average of 199 minutes of physical activity per week] and least active [16 minutes of physical activity per week] subjects was 200 nucleotides, which means that the most active subjects had telomeres the same length as sedentary individuals up to 10 years younger, on average." When pairs of twins with different levels of physical activities were subsequently analyzed, similar results were shown.

The authors suggest a few mechanisms by which more sedentary lifestyles might contribute to telomere degeneration. One could be damage to cells caused by exposure to oxygen, called oxidative stress. Increased inflammation in sedentary persons may also create this effect. Additionally, telomere length has been linked to perceived stress levels. This psychological stress may be reduced by physical activity, thus lessening its severity on telomeres and the aging process.

The authors conclude, relating this to daily life. "The U.S. guidelines recommend that 30 minutes of moderate-intensity physical activity at least five days a week can have significant health benefits," state the authors. "Our results underscore the vital importance of these guidelines. They show that adults who partake in regular physical activity are biologically younger than sedentary individuals. This conclusion provides a powerful message that could be used by clinicians to promote the potential anti-aging effect of regular exercise."

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