Aging may Slow Down by Vegan Diet

Study investigates whether vegan and omnivorous diets differentially impact an individual's epigenetic clock.

Study

The current single-site, randomized, and parallel-group dietary intervention trial compared the effects of healthy vegan and omnivorous diets by analyzing blood DNA methylation patterns, age-related risk factors, and health biomarkers in healthy twins.

Study participants were randomly assigned to either a healthy vegan or omnivorous diet for eight weeks. Individuals assigned to the omnivorous group received animal products, such as six to eight ounces of meat, one egg, and 1.5 servings of dairy, whereas the vegan group avoided all animal products.

The twin-pair study design enables control for age, genetic, and sex differences while simultaneously examining DNA methylation patterns based on diet. A differential methylation analysis was conducted to identify potential DNA methylation markers associated with a healthy vegan or omnivorous diet.

The primary study outcome was based on DNA methylation profiles after the eight-week dietary intervention. Secondary outcomes included insulin, glucose, triglycerides, high-density lipoprotein C (HDL-C), vitamin B12, trimethylamine N-oxide (TMAO) levels, and body weight. Blood methylome levels were also assessed to quantify methylation.

To clarify whether diet impacted biological age and telomere length, several biological age and telomere length predictors derived from DNA methylation were quantified. To this end, both principal component (PC)-based clocks, including the skin+blood Horvath (Horvath2) GrimAge and DNAm telomere clocks, as well as non-PC clocks, such as the Zhang clock based on the elastic net (Zhang-EN) and BLUP (Zhang-BLUP) method, were included. Whereas the second-generation multi-omic informed OMICmAge, the third generation informed the DunedinPACE clock.

Results

The study cohort comprised 21 pairs of identical twins with a mean age of 39.9 years and no history of chronic diseases. In the vegan group, a significant reduction in epigenetic age metrics,

including PC GrimAge, DunedinPACE, and PC PhenoAge, was observed after eight weeks compared to baseline levels. A significant decrease in the composite systems age metrics associated with inflammation, heart, liver, metabolic, and hormones was also observed in the vegan group.

Assessment of telomere length using quantitative polymerase chain reaction (qPCR) assay indicated no significant change among vegan or omnivore cohorts. Moreover, the experimental findings suggest neither diet influenced the overall mitotic clock values. The blood analysis revealed that the basophil levels significantly increased in the vegan group and decreased in the omnivore group.

An epigenetic biomarker proxies (EBP) analysis identified changes in the vegan and omnivorous groups, indicating a significant diet-based interaction. An epigenome-wide analysis indicated differentially methylated loci specific to each diet, thereby providing insights into the affected pathways.

Conclusion

Short-term benefits of a calorie-restricted vegan diet were observed compared to an omnivorous diet based on epigenetic age clocks among healthy twins. In the future, the long-term effects of a vegan diet on epigenetic health must be assessed.

Source:

https://www.news-medical.net/news/20240731/Vegan-diet-may-slow-aging.aspx