Gene Therapy for Prevention of Arthritis in Obese Individuals

An article in U.S. News reports that gene therapy can help prevent kids who are obese from having certain health-related issues like arthritis. Research has found that this gene therapy can help the cells convert inflammation-causing omega-6 fatty acids into omega-3 fatty acids, which are more beneficial. The obesity-related arthritis is promoted by the high-inflammatory omega-6 fatty acids. These fatty acids can be found in many different kinds of foods that are high in fat and/or fried. Not only does this fat induce arthritis, it can also lead to a number of heart diseases along with metabolic disorders. Omega-3 fatty acids can reduce those inflammations and even promote insulin sensitivity and fat-burning. These kinds of fats can be found in different kinds of foods like nuts and fish. Omega-6 and omega-3 fatty acids have a major impact on a child's weight. Consumption of too many omega-6 fatty acids can lead to many different and significant health problems that may be hard to reverse.

Researchers started to develop a cure or kind of therapy that could help reduce the number of omega-6 fatty acids and perhaps convert them to a more beneficial and healthier omega-3 fatty acid. This therapy alters the way a cell may process the harmful fats by placing an enzyme into genes that can convert omega-6 into omega-3 fatty acids. This therapy is placed into an inactive virus so that it may be injected into the body for use. This means that with the injection of this gene therapy, the bad fats are turning into good fats. The director of research at Shriners Children's St. Louis, Farshid Guilak, stated that they were observing how obesity affects the knees of the younger patients. A test with overweight mice was done to see if this gene therapy would help improve their symptoms. Each mice received one injection of the gene therapy and the results were found to be improved metabolic health as well as improved early symptoms of knee arthritis. It was found that the number of cells that increase or promote inflammation had also gone down.

A study reported in the Science Advances journal shows that the follistatin (FST) gene therapy can prevent obesity, metabolic disease, and even osteoarthritis. FST is a protein that can bind myostatin and activin, which may be able to reduce inflammation. In this study, it was hypothesized that the delivery of FST can mitigate metabolic inflammation and knee osteoarthritis that is caused by a high-fat diet in mice. This was also tested with other mice with different diets and regardless of which diet the mice had, the mice with the FST gene therapy did not have osteoarthritis or bone remodeling that is induced by joint injury. With this information, it can be said that the FST gene therapy can be a multifunctional therapeutic approach for metabolic inflammation in obesity as well as injury-induced osteoarthritis.

The news article and the scientific-reviewed article both report very similar findings and studies about how gene therapy can help reduce arthritis in individuals who are obese. However, the new article is not as in-depth as the journal article. Since the news article is a secondary article, it is not as reliable as the primary article. It is still accurate in information, but to gather more information, the primary article has a higher accuracy in information.

Citations:

Thompson D., 2024 October 15. *Gene Therapy Might Tweak Fats, Help Prevent Arthritis in Overweight Kids. U.S. News* https://www.usnews.com/news/health-news/articles/2024-10-15/gene-therapy-might-tweak-fats-help-prevent-arthritis-in-overweight-kids

Harasymowicz, N. S. et al. *Gene Therapy for Follistatin Mitigates Systemic Metabolic Inflammation and Post-Traumatic Arthritis in High-Fat Diet-Induced Obesity*. *Science Advances;* 10.1126/sciadv.aaz7492. (2020). https://pmc.ncbi.nlm.nih.gov/articles/PMC7209997/