A crucial role in identifying Alzheimer’s disease (AD) is the Apolipoprotein E (APOE) genotype due to its frequency in genetic factors that are common for AD. Through many different studies, the understanding of this condition has expanded quite far, allowing researchers to understand the various ways that ways the body functions. In this article, the research focuses on the relationship between the APOE genotype, and the microbiome found in the gut. By studying the makeup of both humans and mice that have been specifically designed for APOE-targeted replacement, relationships between genotypes, profiles of gut microbiomes, and metabolic factors have been discovered. Discovering these new relationships leads researchers to believe that this could be a new way of limiting or even turning back the effects that the APOE alleles have, as well as limiting mental deterioration and preventing AD.

This research article details the relationship that the makeup of the gut’s microbiome and APOE genotype share. While these two factors would not initially be thought of as connected, research shows that the gut microbiome affects more of the workings of the body than realized. Because APOE is a genetic factor, that increases the risk of Alzheimer's, there have been past studies that focused on other methods that also were attached to APOE. In this article researchers focused on the microbiome’s reaction to genotypes, examples include the change in metabolism and diversity of species. By studying the gut microbiomes of both the mice and humans, the researchers are looking forward to the new possibilities of how this relationship can affect the health of future generations.

For individuals in the experiment who had different APOE genotypes, researchers performed a fecal microbiota sequence. In doing so they found that the overall diversity of the specimens that were sequenced had little to no differences from the collection of human genotypes. However, particular bacteria did display variation in population size between the genotypes. These findings were verified when the gut microbiomes of the mice were analyzed. Through further investigation, differences were found in the short fatty acids and amino acids that are often linked to microbes and genotypes.

The importance of the link between the APOE genotype and Alzheimer’s is stated throughout this article. Because the gut microbiome serves many different functions, beyond just digestion, many factors of its mechanics have yet to be discovered. With this newly discovered link between the decline of mental capabilities and microbiome disruption, researchers are determined to understand how the profiles of the gut microbiomes can be influenced by genotype. With these new findings, researchers may have found a new way to combat Alzheimer’s progression and improve the overall health of the brain.

In conclusion, the article “APOE Genotype Influences the Gut Microbiome Structure and Function in Humans and Mice: Relevance for Alzheimer’s Disease Pathophysiology” details a comprehensive and somewhat complex relationship between the gut microbiome, APOE genotype, and Alzheimer’s. By discovering these relationships between genotype and bacteria researchers were able to gather attention to a new possibility in the limitation and mitigation of Alzheimer’s disease and mental degradation. With even more time and research in this field, there is the ever-improving possibility of new and exciting ways of treating and combating Alzheimer’s and overall decline in mental abilities. Having seen the effects that mental deterioration can have on an individual’s health, this is an exciting possibility in the treatment of conditions that have a negative impact on brain health.

Citations

Tran, Tam T. T. et al. APOE genotype influences the gut microbiome structure and function in humans and mice: relevance for Alzheimer's disease pathophysiology. FASEB Journal. https://doi.org/10.1096/fj.201900071R (2019).