The Effects of Different Diets on Neurological Function; Implications for Alzheimer's and Parkinson's Disease

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Objectives The objective of my experiment was to test the effect different diets (high sugar or keto) have on neurodegenerative diseases by measuring basal slowing rate in C. elegans which have been fed these diets in their culture medium. Methods To test this, 2, 10, and 20mM of beta-hydroxybutyrate (mimics a keto-diet) and 20, 40, and 80mM of glucose (mimics high sugar diet) were applied separately to the agar medium that the C. elegans were cultured in. The C.elegans were cultured in their treatments for 24 hours, and then the basal slowing rate was calculated after 8, 24, and 48 hours of culturing. Basal slowing rate was determined by counting the amount of bends a C. elegan had in the span of 20 seconds. Results There was a linear increase in the BSR as the concentration of beta-hydroxybutyrate increased. By contrast, my groups given glucose had a linear decrease in BSR as the concentrations got higher. The highest average BSR was in the group with the highest dose of beta-hydroxybutyrate (22.13), and the lowest average BSR was in the group with the highest dosage of glucose (12.87). The control group had an average BSR of 16.93 bends, showing glucose decreased it and beta-hydroxybutyrate significantly increased it. Conclusion My results show that a diet high in glucose can potentially increase the chances of dopaminergic degeneration, which can lead to neurodegenerative disease. Keto-diets, however, will improve dopaminergic function and decrease the chances of a neurodegenerative disease developing.

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