Neuroprotective Effects of Nutraceutical Supplementation for Chronic Traumatic Encephalopathy

Lumbreras, Santiago (School: Granbury High School)

CTE, a progressive neurodegenerative condition from repetitive head impacts in sports, lacks preventive interventions. This research examines curcumin and CoQ10's neuroprotective effects in a Drosophila model of CTE. Using standardized protocols, head impacts were delivered to flies through a HIT device. The study evaluated 250 flies across five groups: control, TBI only, nutraceutical only, post-impact treatment, and pre/post-impact supplementation. Behavioral analysis measured motor function via geotaxis assays, aggression patterns, and survival rates. Results showed pre/post supplementation with curcumin (50 μM) and CoQ10 (200 μM) significantly reduced TBI-induced deficits, with pre-treatment offering superior protection. Statistical analysis confirmed improvements in motor function, reduced aggression, and increased survival in treatment groups versus TBI-only controls. Deficits worsened over time with repeated TBI exposure. Findings suggest nutraceutical intervention, especially before TBI, represents a promising preventive strategy warranting further investigation in higher-order models and human trials.

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