Effect of GuaCa Extract on the Modulation of Oxidative Stress and Neuronal Biomarkers in SH-SY5Y Cells

INTRODUCTION: Oxidative stress, resulting from an imbalance between the production of oxidizing agents and antioxidant levels, is considered one of the main causes of neurodegenerative diseases such as Parkinson's disease. In this context, the search for antioxidant compounds capable of mitigating oxidative damage becomes relevant. An aqueous extract from cocoa seed husk and guarana powder (GuaCa) appears to be a promising alternative due to the presence of substances such as catechins, quercetin, and epigallocatechin. **OBJECTIVE:** To evaluate the effect of the GuaCa extract on the modulation of oxidative stress and neuronal biomarkers in SH-SY5Y cells. **MATERIALS AND METHODS:** The GuaCa extract was prepared by combining guarana powder and cocoa seed husk. SH-SY5Y cells, commercially obtained and maintained under optimal culture conditions, were seeded and supplemented with GuaCa extract at concentrations of 0, 0.1, 0.3, 1, 3, 10, 30, 100, and 300 µg/mL. After 24 hours, cell viability was assessed using the MTT assay (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide). A concentration of 10 µg/mL was selected to evaluate DNA oxidation capacity via quantification of 8-hydroxy-2'-deoxyguanosine and BDNF (brain-derived neurotrophic factor) levels. Both tests were conducted using immunoassay kits from Elabscience® Biotechnology (Houston, TX, USA). Statistical analysis was performed using GraphPad Prism 9.5.1, with significance set at $p < 0.05$. **RESULTS:** GuaCa extract significantly increased mitochondrial viability at concentrations from 3 µg/mL without raising DNA oxidation levels. Furthermore, supplementation with 10 µg/mL significantly increased BDNF levels compared to the control group ($p < 0.05$), suggesting a potentially neurogenic effect. **CONCLUSION:** The in vitro supplementation with GuaCa extract demonstrated potentially beneficial functional properties in SH-SY5Y cells, possibly offering preventive action against cellular changes associated with neurodegenerative diseases. However, further studies are needed to elucidate its molecular mechanisms and confirm its safety in in vivo models.