

Dementia and Alzheimer's Disease

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Alzheimer's risk factors and impact on heart: Role of Propolis, Vinpocetine and Cocoa combination in enhancing the protective power of mental and physical activity in rats

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Background: Alzheimer's disease (AD) is a progressive disorder that causes brain cells to waste away and die, memory loss is the key symptom of the disease. Protein malnutrition (PM) and Social isolation (SI) have strong correlations with cognitive decline, they precede the onset of dementia and represent risk factors in AD progression. Oxidative stress (OS) is also associated with AD progression and the deleterious effect of SI and PM on the heart, but mental and physical (M& Ph) activity can provide marked protection. Propolis (PROP) with its antioxidant ability can be an effective treatment for slowing down the damage caused by OS. Vinpocetine (VIN) can improve cerebral functions and enhance memory, it promotes cerebral utilization of oxygen and glucose. Cocoa can reduce stress, depression and promote better memory, the promising health benefits of cocoa flavonoids have been evidenced especially in cardiovascular and cerebrovascular disorders.

Objective: Study the correlation between heart-healthy and AD progression especially under the risk of PM&SI as well as, evaluate the impact of VIN, PROP and Cocoa combination in enhancing the power of M&Ph activity versus progression of AD in Rats.

Methods: Two major groups of rats were used; Normally- fed (NF) or PM (10% casein diet) group and each contain two sets; socialized or isolated set. Both sets were subdivided into 4 subgroups; two received saline (normal) and two received ALCI3, 70mg/kg IP every day (AD model) during the five weeks of the experiment. One normal and one AD model subgroups from each set were received orally combination treatment of PROP (300mg/kg), VIN (20mg/kg) and Cocoa (24mg/kg) together with weekly exposed to M&Ph activity using forced swimming and Y-maze tests. Biochemical parameters (AChE, A β , Tau, β -secretase, monoamines, oxidative stress and inflammatory markers) as well as DNA fragmentation and brain derived neurotrophic factor (BDNF) were estimated in the brain together with heart functions measurements (serum CKMB, PTX-3, Troponin, AST, HDL, LDL and Cholesterol). Histopathological changes in the heart and different brain regions were also examined.

Results: The deleterious effects of PM and SI on the heart were more sever with AD progression as indicated by the significant increase in serum CKMB, PTX-3, troponin, AST, LDL and Cholesterol together with the decrease in HDL. However, the protective effects of PROP, VIN and Cocoa combination enhanced the protection induced by M&Ph activity against the risk of PM and SI on heart especially in AD-associated groups. Histopathological examinations of the heart and brain confirmed the biochemical ones.

Conclusion: Marked protection against the deleterious effect of PM and SI on the heart during AD development was induced by using PROP, VIN and Cocoa combination. Moreover, they enhanced the protective power of M&Ph activity against hazards of different risk factors on the heart and brain.

Speaker Biography

Azza A Ali has completed her PhD specialized in Pharmacology and Toxicology from Faculty of Pharmacy, Cairo University, Egypt. Her postdoctoral studies included different scientific aspects especially on neurodegenerative disorders; she also developed research line of behavioral pharmacology in Egypt and participated as Advisory Board Member of the Arab Association for Pharmacy Development and at the Arab International Pharmacy Conference (AIPC 2019). She is member of many scientific societies as (AAPS) and Alzheimer's Association (ISTAART). She is also Editorial Board Member of many international Journals as Brain Disorder & Therapy, Acta Psychopathologica, EC Pharmacology and Toxicology as well as Organizing Committee Member and Chairperson at many international Conferences as the International Conference on Brain Disorders & Dementia Care, Canada (2017) and International Conference on Parkinson's Disease & Movement Disorders, USA (2017, 2018). She published more than 60 papers in reputed journals, supervised and discussed more than 90 PhD and MSc thesis and actively participated by workshop, oral and posters presentations at many international conferences especially on Dementia and Parkinson's disease and in the Alzheimer's Association International Conference (AAIC 2016, 2017). She has many appreciation certificates and certificate of best presentation award at 19th International Conference on Environmental Pollution and Pollution Control, London, UK (ICEPPC 2017). Now she is a Head of Pharmacology and Toxicology Department and Member of the Committee for the Promotion of Professors at Al-Azhar University, Egypt.

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