Comparative study on the influence of Epigallocatechin-3-gallate and/ or Coenzyme Q10 on induction of Alzheimer’s disease in normally-fed and protein malnourished rats

Azza A Ali, Hebatalla I Ahmed¹, Mona G Khalil², Asmaa I Alwakeel¹ and Karema Abu-Elfotuh¹
¹Al-Azhar University, Egypt
²Modern University for Technology and Information, Egypt

Alzheimer’s disease (AD) is a progressive neurodegenerative disorder pathologically characterized by deposition of β-amyloid (Aβ) peptides which influenced by oxidative stress and mitochondrial dysfunction. Protein malnutrition increases oxidative damage in cortex, hippocampus and cerebellum. Epigallocatechin-3-gallate (EGCG) has health-promoting effects in CNS, while coenzyme Q10 (CoQ10) is intracellular antioxidant and mitochondrial membrane stabilizer. This study aimed to evaluate the potential protective effects of EGCG and / or CoQ10 against aluminum-induced AD in both normally-fed (NF) and protein malnourished (PM) rats. Both NF and PM groups received daily for four weeks, either saline for control groups or ALCl₃ (70mg/kg, IP) for AD induction groups. Treated groups received together with ALCl₃, either EGCG (10mg/kg, IP), CoQ10 (200mg/kg, PO) or combination of both. Histopathological changes in the brain and biochemical changes in Aβ, Acetyl cholinesterase (ACHE) as well as oxidative parameters; (MDA, SOD, TAC) were evaluated for all NF and PM groups. The study revealed that, the progressive brain neurological damage characterizing induction of AD was more pronounced in PM rats. EGCG or CoQ10 has protective effects against brain neural damage accompanied induction of AD as indicated by decreased Aβ, ACHE, MDA together with increased SOD, TAC and confirmed by Histopathological examinations in different brain regions. EGCG and CoQ10 combined therapy showed marked protective effects in both NF and PM rats rather than each individual treatment.

azzamoro@gmail.com