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The Possible Interaction between the Influence of Epigallocatechin-3-gallate and Wheat Grass Together with Mental and Physical Activities against Alzheimer's disease in Isolated and Socialized Rats

Background: Alzheimer's disease (AD) is the most common cause of dementia where symptoms gradually worsen over a number of years. Social isolation exacerbates memory loss while mental and physical activities training can help in maintaining cognitive functions. Epigallocatechin-3-gallate (EGCG) is a natural chelator with health-promoting effects in CNS and wheat grass is a natural antioxidant and has high ability to counteract free radicals. Objective: To study the combined effects of EGCG and wheat grass together with mental and physical activities against induction of AD as well as to compare between their combined effects in socialized and isolated conditions.

Methods: Eight groups of rats (4 socialized and 4 isolated) were exposed to both Swimming test and Y-maze (each for one time/week) for maintaining mental and physical activities. Two groups of socialized as well as of isolated rats were normal rats while the others were AD rat's model (received daily 70mg/kg $AlCl_3$, IP). During the four weeks of the experiment, normal and AD rats in either isolated or socialized conditions received either saline for control or EGCG (10mg/kg every other day IP) & wheat grass (100mg/kg PO daily) for treated groups. Cages covered with black plastic were used for social isolation. Changes in brain $A\beta$, ACHE, monoamines, inflammatory mediators, oxidative parameters as well as brain derived neurotrophic factor (BDNF) were measured for all groups. Histopathological changes in different brain regions were also detected.

Results: Brain neurological damage characterizing isolation and/or AD were more severe in isolation-associated AD

group. EGCG and wheat grass together with mental and physical activities showed higher protection against hazards of $AlCl_3$ or isolation than mental & physical activities alone especially in isolation-associated AD group. Their protection was indicated by the significant decrease in $A\beta$, ACHE, MDA, TNF- α , IL-1 β together with the increase in SOD, TAC, brain monoamines, BDNF and confirmed by histopathological examinations.


Conclusion: EGCG and wheat grass together with mental and physical activities has more pronounced protective effect against brain neuronal degenerations associated the development of AD especially in social isolation conditions than mental and physical activities alone.

Key words: Alzheimer's disease; Epigallocatechin-3-gallate; Wheat grass; Mental and physical activities; Social isolation; Rats.

Speaker Biography

Prof. Azza A Ali has completed her PhD specialized in Pharmacology and Toxicology from Faculty of Pharmacy, Cairo University. Her postdoctoral studies included different scientific aspects related to her specialization field with giving especial interest to researches of neuropharmacology and psychopharmacology; she also developed research line of behavioral pharmacology in Egypt. She is member of many scientific societies in Egypt and of (AAPS) American Association of Pharmaceutical Scientists (2002) and published more than 35 papers in reputed journals, supervised and discussed more than 50 PhD and MSc thesis and actively participated by oral and posters presentations at many international conferences especially on Alzheimers disease & Dementia. Now she is a Head of Pharmacology and Toxicology Department at Al-Azhar University and she sacrifices great effort hoping to find real treatment that can prevent or delay the progression of Alzheimers disease especially in the high-risk individuals focusing on depression, stress and malnutrition.

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