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Aluminum Induced Alzheimer's disease: Induction, Progression, Risk Factors and Protection

Azza A Ali
Al-Azhar University, Egypt

Alzheimer's disease (AD) is the most common cause of dementia. It is a progressive neurodegenerative disorder that leads to nerve cell death throughout the brain. It is a growing public health problem with major socioeconomic burden. The progression of AD is time dependent, it spread spontaneously but there is a lack of data in understanding its progression. By identifying the stage of the disease, prediction is possible, symptoms can be expected and the power to find real treatment will be enhanced.

Modeling stages of Alzheimer's disease in rats: Aluminum (Al) has been implicated in aging related changes. It crosses the blood brain barrier and has been found in both senile plaques and neurofibrillary tangles-bearing neurons in the brains of AD patients. Its neurotoxicity in animals has been clearly established and shown to be involved in the etiology of AD. To establish a model mimics AD in rats and for modeling stages of the disease as well as to determine its progression in the brain in response to time, different doses of aluminum can be used for different periods. It was found that 70 mg/kg of aluminum for 6 weeks represents the ideal model that mimics AD in rats. The progression of the disease is time dependent and just starts spread spontaneously without more aluminum exposure.

Risk Factors and Protection of Alzheimer's disease: Major attention has been paid to AD risk factors; some risk factors can be changed while others cannot. Modifiable risk factors include stress, heavy smoking, excessive alcohol drinking, depression, low education, cognitive and physical inactivity as well as malnutrition. Exposure to stress represents a risk factor in both induction and progression of AD especially in the developed countries, while protein malnutrition increases both severity as well as progression of AD and represents a socioeconomic problem especially in the developing countries. There are many medical conditions that increase the chance of developing dementia especially Parkinson's disease and diseases related to learning disabilities. For the complexity of the mechanisms involved in AD, multi-target directed strategies by using combined therapies together with physical and mental activities represent new promising strategies for reduction of AD prevalence and for providing marked symptomatic and disease modifying benefits especially with risk factors. However, further researches are needed to improve the quality of evidence associated with reduction of AD prevalence and incidence.

Speaker Biography

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 as well as of (AAPS) American Association of Pharmaceutical Scientists (2002) and (ISTAART) The Alzheimer's Association International Society to Advance Alzheimer's Research and Treatment (2016). She published more than 50 papers in reputed journals, supervised and discussed more than 80 PhD, MSc thesis and actively participated by oral and posters presentations at many international conferences especially on Alzheimer's disease & Dementia as Dementia 2015, 2016 and Alzheimer's Association International Conference (AAIC 2016). She has many appreciation certificates and certificate of best presentation award at 19th International Conference on Environmental Pollution and Pollution Control (ICEPPC 2017). 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 Alzheimer's disease especially in the high-risk individuals focusing on depression, stress and malnutrition.

e: azzamoro@gmail.com

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