THE NEW ARMENIAN MEDICAL JOURNAL
Volume17 (2023), Issue 3 p.40-50

DOI: https://doi.org/10.56936/18290825-2023.17.3-40

THE EFFECT OF GALLIC ACID AS A PLANT POLYPHENOL COMPOUND ON OXIDATIVE STRESS INDUCED IN ALZHEIMER'S NEURODEGENERATIVE DISEASE

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Received 26.12.2022; accepted for printing 5.06.2023

Abstract

Alzheimer's disease as a neurodegenerative disorder is the most common reason of dementia. This disease is associated with many problems, including the inability to perform daily life activities and mood changes. The disease is defined by neuropathological signs including intracellular neurofibrillary tangles and extracellular amyloid beta plaques. Oxidative stress plays an important role in neurological diseases such as Alzheimer's, which can change the signaling pathways and change the function of the tau protein. Since there are many sources of reactive oxygen species in neurons, these cells create a system of antioxidant defense to protect themselves from free radical damage. Disruption of this antioxidant defense can make nerve cells vulnerable to oxidative damage. Natural compounds that have antioxidant properties can largely protect cells against these oxidative damages. One of these compounds is gallic acid, which is a phenolic compound and has a very strong antioxidant activity. This compound is found in plants such as oak bark, tea leaves, sumac, grapes, coriander, honey, berries, pomegranate, mango, and other fruits and vegetables. Gallic acid inhibits the accumulation of beta-amyloid plaques and reduces neurotoxicity, which prevents neurotoxicity and oxidative damage.

The aim of this study is to review the effect of gallic acid as a plant polyphenol compound on oxidative stress induced in Alzheimer's neurodegenerative disease.

Keywords: *polyphenol, gallic acid, antioxidants, oxidative stress, Alzheimer's disease.*

Introduction

Alzheimer's disease (AD) as a neurodegenerative disorder is the most prevalent reason of dementia. Neuropathologically, the disease is defined by the combined presence of extracellular amyloid beta (Aβ) plaques and intracellular neurofibrillary tangles. Amyloid beta plaques are deposited in the brain and the intracellular neurofibrillary composed of phosphorylated tau protein is shown excessively and abnormally. As a result of these pathways, synaptic- and neuro-toxicity occurs, leading to neuron loss and eventually brain atrophy [*Murphy M, LeVine H, 2010; Chen X, Mobley W, 2019*]. Alzheimer's disease is associated with neurodegeneration in brain areas involved in cognition such as the hippocampus, and entorhinal cortex, and brain areas involved in emotional behaviors

Cite This Article as:
Sani M., Hokmabadi M.E. (2023). The Effect Of Gallic Acid As A Plant Polyphenol Compound On Oxidative Stress Induced In Alzheimer's Neurodegenerative Disease; The New Armenian Medical Journal, vol.17(3), p 40-50; https://doi.org/10.56936/18290825-2023.17.3-40

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