

Insight into the link between Alzheimer's and type 2 Diabetes

Mina Hajizadeh

Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran

“Presented at the Postgraduate Biophysical Seminars, Winter 95 (2017)”

Abstract

Introduction: studying about links between diabetes and Alzheimer disease is one of the most significant fields in which many researchers of life science or medicine have done examinations on them. According to statistics released by the World Health Organization "diabetes is the sixth and Alzheimer's is the seventh leading cause of worldwide death" and it makes us do more research on the subject. Among the relationship between the two diseases can be noted to beta-amyloid, oxidative stress, tau protein, insulin receptors, advanced glycation end products (AGE), which the better understanding of these diseases can be a way to better control them.

Methods: We investigate several physical properties included isoelectric focusing (IEF), fluorescence, Mass Spectrometry, Atomic Force Microscopy (AFM), Nuclear magnetic resonance spectroscopy (NMR)

Results and discussion: The investigation confirmed that increasing the amount of blood sugar in people with diabetes and those without diabetes causes dementia, including Alzheimer's disease. The brain is the organ of the body is hurt by an increase in blood glucose. given that the cure for Alzheimer's disease had not been reported, Can control blood sugar levels by techniques that are causing it to prevent early detection and control. You can also disrupt communication path of these two diseases by reducing free radicals, resulting in oxidative stress pathways is activated, preventing the formation of amyloid plaques and even hoped to cure diseases.

Conclusion: Now, to better recognize the link between diabetes and Alzheimer's and also step forward on the path of their relationship the science of biophysics and biophysical tools can be great assistance.

Keywords: diabetes, Alzheimer, amyloid-beta, oxidative stress, insulin receptor, fibril formation, advanced glycation end products (AGE)

Reference

- 1-D. Allan Butterfield , Fabio Di Domenico , Eugenio Barone, *Biochimica et Biophysica Acta* 1842 (2014) 1693–1706
- 2-Wei-Qin Zhao a , Matthew Townsend, *Biochimica et Biophysica Acta* 1792 (2009) 482–496
- 3-Subbiah Pugazhenthii , Limei Qin a , P. Hemachandra Reddy, *Biochimica et Biophysica Acta* xxx (2016) xxx–xxx
- 4-Victor A. Streltsov, Stephen J. Titmuss, V. Chandana Epa, Kevin J. Barnham, Colin L. Masters, Joseph N. Varghese, *Biophysical Journal* Volume 95 October 2008 3447–3456
- 5-Subramanian Vivekanandan a,b , Jeffrey R. Brender a,b , Shirley Y. Lee a , Ayyalusamy Ramamoorthy, *Biochemical and Biophysical Research Communications* 411 (2011) 312–316