

9th International Conference on
DEMENTIA AND DEMENTIA CARE

September 24-25, 2018 London, UK

Neuroprotective potential of physical exercise: Plasticity-related mechanisms in the aging brain

Lerner Y¹, Eisenstein T¹, Giladi N¹, Yogev-Seligmann G², Ash E² and Hendler T^{1,2}

¹Tel Aviv University, Israel

²Tel Aviv Sourasky Medical Center, Israel

Mild Cognitive Impairment (MCI) is a prodromal stage of Alzheimer Disease (AD). To date, therapeutic approaches to AD are symptomatic and of modest efficacy. Nonetheless, studies in animal and human populations suggested that physical training results in structural and functional brain changes. The current project aims at exploring brain mechanisms mediating the neuroprotective effect of different types of physical exercise among patients with amnesic MCI (aMCI). Specifically, we performed a comprehensive study to examine the effect of aerobic and non-aerobic training. Neuropsychological evaluations, assessment Brain-derived neurotrophic factor (BDNF), cardiorespiratory fitness assessment and fMRI have been performed before the physical training and following the intervention. 24 participants suffering of aMCI carried out their activity routines 3 days/week during 4 months under supervision of an experienced trainer. Inter-SC and GLM methods have been used for data analysis. Following intensive individual training, we found improvement in memory and executive functions in both physical training groups. In the fMRI, we found reliable responses in regions that are related to higher order processing of information, temporoparietal junction, marginal and supramarginal gyri, frontal areas. Hippocampal activation in memory encoding task increased following aerobic intervention. Increased BDNF was correlated with improved cognition, with no association with the type of exercise. The physical training results in functional and structural changes in a-MCI. The findings demonstrated that cognitive performance can be affected by exercise of both types. The insights gained from the study may have important scientific value and clinical implications for individuals at the early stages of AD.

Biography

Dr. Lerner is a senior researcher at the Sagol Brain Institute Tel-Aviv and a senior lecturer at the Tel Aviv University. Her scientific journey began in Azerbaijan, a republic located on the Western shore of the Caspian Sea. At Baku State University, she earned a master's degree in mathematics, before moving to Israel. She is the leader of the Cognitive Resource and Plasticity research team at the Sagol Brain Institute.

yulia.lerner@gmail.com

Notes: