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New-LED-based light therapy improves cognitive function in mouse model of Alzheimer's disease

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We aimed to investigate the effects of LED-T on plaque formation, gliosis, and neuronal death to prevent cognitive impairment and dementia, and optimal timing of LED-T initiation for functional recovery. LED-T was applied by placing the skin-adhesive light-emitting probes onto the skin at two locations on the head. Experimental groups receiving treatment are divided into early-treat group and late-treat group according to the time of starting LED-T [2 months (early group) or 6 month (late group)], and the mice of each group received LED-T three times a week for 14 weeks, 20 minutes per session. Morris Water Maze, passive avoidance test, and elevated plus maze were evaluated at 10 months of age. The brain sample for immunohistochemistry (IHC) was used by cryosection. In the Morris Water Maze test, early-treat group of both groups showed improved learning and memory, and recovery of reduced anxiety compared to the light-untreated group was evaluated by the elevated plus maze. Aβ1-42 and thioflavin-S, early stage LED-T may reduce plaque production in the cortex and amyloid precursor protein was staining with no difference between the groups. The western blot results showed an increase in NEP in the early group compared to the sham group. As a result, LED-T has a decomposition effect on the plaque. In addition, the activation of microglia decreased in the cortex area of the LED-T treatment group. LED-T reduced the amyloid plaque in the 5XFAD mouse and alleviated the behavioral characteristics of Alzheimer's disease.

Biography

Hae In Lee has completed her PhD at Pusan National University. She is the Professor at Yangsan Pusan National University Hospital. She has published more than 10 papers in international journals and her research interests include the areas of neurorehabilitation based on neuroscience after CNS diseases. Currently, her research interest is Neuromodality.

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