

The effect of Reference memory on the number of astrocytes in different subfield of rat's hippocampus

Mehrdad Jahanshahi (PhD) *¹, Yousef Sadeghi (PhD)²
Ahmad Hoseini (PhD)², Naser Naghdi (PhD)³

¹ Assistant Professor, Department of Anatomy, Gorgan University of Medical Sciences, Gorgan, Iran.

² Professor, Department of Anatomy, Cellular and Molecular Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran. ³ Professor, Department of Physiology, Institute of Pasteur, Tehran, Iran.

Abstract

Background & Objective: In addition to pyramidal neurons and interneurons, the hippocampus contains Astrocytes that play important roles in regulating ion flux currents, energy production, neurotransmitter release and memory. Learning needs some instrument for information storage and information maintenances mechanisms resemble to memory. The aim of this study was determination of spatial memory effect on the number of astrocytes in rat's hippocampus.

Materials & Methods: In this experimental study, with usage of Morris Water Maze and Reference memory technique, we used 10 male albino wistar rats. 5 rats were in control group and 5 rats in Reference memory group. After histological preparation, the slides were stained with PTAH staining for showing the Astrocytes.

Results: The findings of this study showed significant difference in astrocytes number in CA1, CA2 and CA3 area of hippocampus between control and reference memory group. The mean and SD of astrocytes in CA1, CA2 and CA3 of reference memory group were 118.57 ± 25.29 , 58.91 ± 23.59 and 116.6 ± 31.14 , that they are more than control group with 49 ± 17.29 in CA1, 48.8 ± 25.21 in CA2 and 41.95 ± 11.22 in CA3.

Conclusion: We concluded that the number of astrocytes increased due to spatial learning (e.g. reference memory method).

Key Words: Hippocampus, Astrocytes, Reference memory, Spatial learning

* Corresponding Author: Mehrdad Jahanshahi (PhD), E-mail: mejahanshahi@yahoo.com