Received: 3.8.2011 Accepted: 27.9.2011

Letter To Editor

Treadmill running improves spatial learning and memory in the rats with intracerebroventricular injection of streptozotocin

J Res Med Sci 2011; 16(10): 1386-1387

Exercise has positive effects on central nervous system, especially when there is a context of disorder.¹ Considering the prevalence of Alzheimer's disease and lack of a decisive treatment, this study aimed to evaluate the effect of exercise on learning and memory in rats after intracerebroventricular injection of streptozotocin (ICV-STZ), a well defined model for Alzheimer's disease.²

Experimental groups consisted of sham-rest, sham-exercise, lesion-rest and lesion-exercise groups. Rats in lesion group received ICV-STZ. In the exercise group, rats were made to run on a treadmill (20 m/min, 0-degree inclination, 50 min/day, 4 weeks). Mor-

ris water maze test was used to evaluate spatial learning and memory.

The results showed that spatial learning and memory indices were significantly impaired in the rats with ICV-STZ (Figure 1). However, exercise prevented impairments as there was a significant difference between lesion-exercise and lesion-rest groups.

The findings of this study suggested that similar to Alzheimer's disease, ICV-STZ severely impairs cognitive process, but exercise prevents this damage. Therefore, exercise probably is helpful in prevention and alleviation of cognitive disorders in Alzheimer's disease.

Mahdieh Yosefi¹, <u>Parham Reisi</u>², Hojjatallah Alaei³, Ali Asghar Pilehvarian⁴, Bahman Rashidi⁵

Conflict of Interests

Authors have no conflict of interests.

Corresponding Author: Parham Reisi E-mail: p_reisi@med.mui.ac.ir

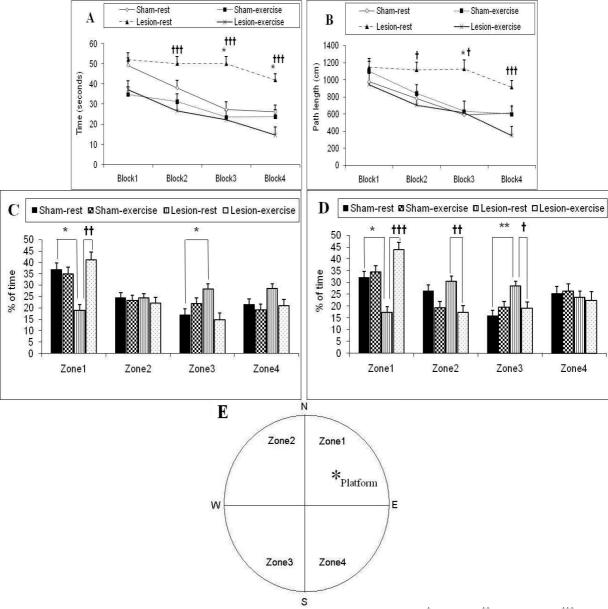
¹⁻Student, Department of Basic Sciences, Isfahan Payame Noor University, Isfahan, Iran

²⁻ Assistant Professor, Biosensor Research Center and Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

³⁻ Professor, Department of Physiology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

⁴⁻ Assistant Professor, Department of Basic Sciences, Isfahan Payame Noor University, Isfahan, Iran

⁵⁻ Assistant Professor, Department of Anatomical Sciences and Molecular Biology, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran



Result are presented as mean \pm SEM; * p < 0.05, ** p < 0.01 vs. sham-rest group, † p< 0.05, †† p < 0.01 and ††† p < 0.001 vs. lesion-exercise group; n = 8-11.

Figure 1. Effects of exercise and ICV-STZ on the escape latencies (A) and the path length (B) at different block to reach the platform (lower numbers indicate better performance); and performance during the probe trials as measured by mean percentage (%) of time spent in each of the four zones 1 day (C) and 1 week (D) after spatial acquisition phase. Schematic diagram of tank and site of the platform (E).

References

- **1.** Reisi P, Alaei H, Babri S, Sharifi MR, Mohaddes G. Effects of treadmill running on spatial learning and memory in streptozotocin-induced diabetic rats. Neurosci Lett 2009; 455(2): 79-83.
- **2.** Ishrat T, Parveen K, Khan MM, Khuwaja G, Khan MB, Yousuf S, et al. Selenium prevents cognitive decline and oxidative damage in rat model of streptozotocin-induced experimental dementia of Alzheimer's type. Brain Res 2009; 1281: 117-27.