تاریخ دریافت 1393/04/18 تاریخ پذیرش 1393/06/30

CA3 CA1

Email: mehjour@yahoo.com

[illegible]

[illegible]

[illegible]

[illegible] Sham (γ = [illegible]

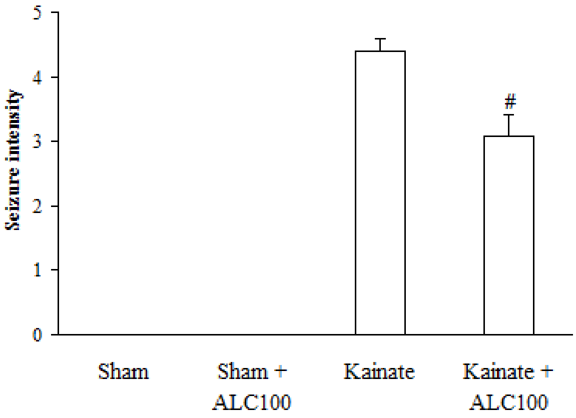
[illegible] CA3 [illegible]

(SEM)

$p<0/05$

CA1

CA3

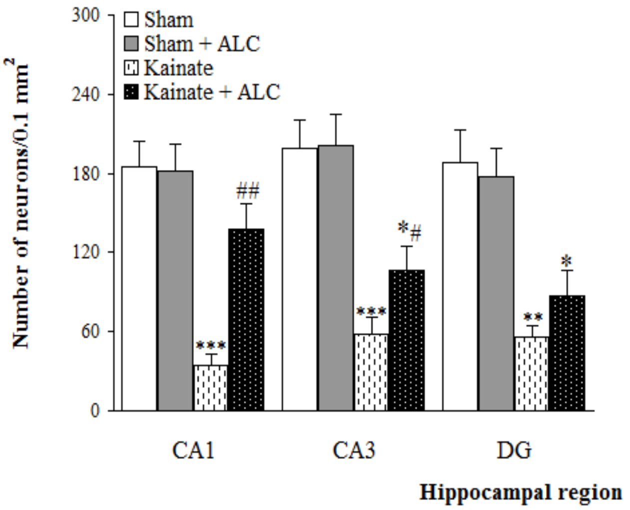


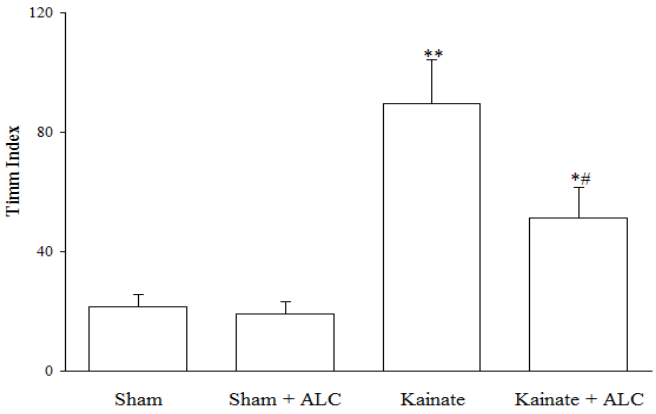
P<T/TY #

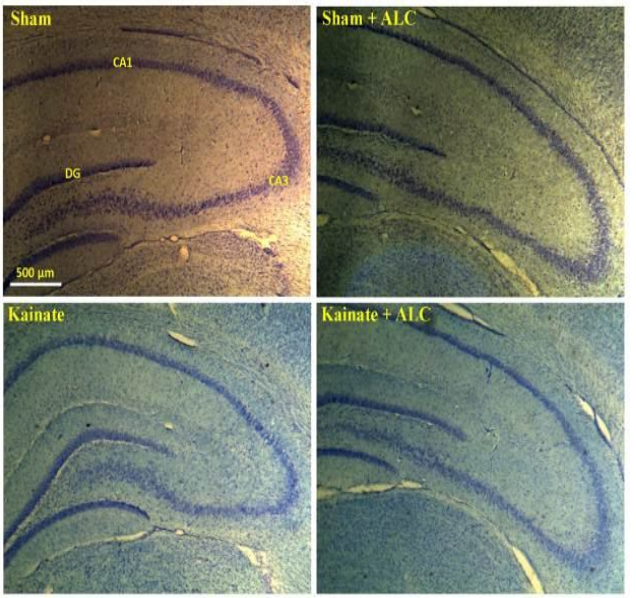
(p<T/TTΩ T/TTY)

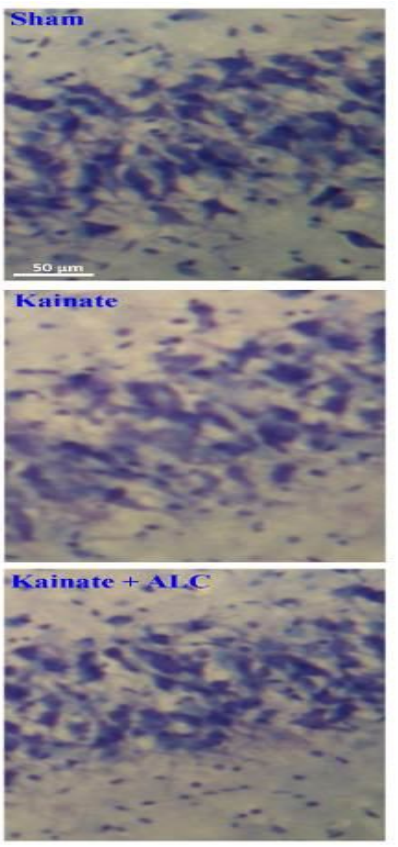
CA1

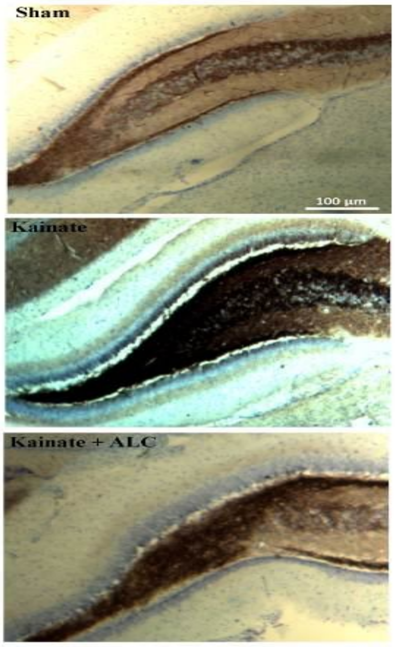
CA3 CA1


Sham
Sham + ALC
Kainate
Kainate + ALC
Number of neurons/0.1 mm2
300
240
180
120
60
0
CA1
CA3
DG
Hippocampal region
***
***
**
##
*#
*


Timm Index
120
80
40
0
Sham
Sham + ALC
Kainate
Kainate + ALC
**
*#


Sham
CA1
DG
CA3
500 µm
Sham + ALC
Kainate
Kainate + ALC


Sham
50 µm
Kainate
Kainate + ALC


Sham
100 µm
Kainate
Kainate + ALC

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Original Article

THE EFFECT OF ACETYL L CARNITINE ON PREVENTION OF HIPPOCAMPAL NEURODEGENERATION AND MOSSY FIBER SPROUTING IN AN EXPERIMENTAL MODEL OF TEMPORAL LOBE EPILEPSY IN RAT

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Abstract

***Background & Aims*:** Temporal lobe epilepsy is due to structural and metabolic changes in hippocampus including marked degeneration of neurons. Considering some evidences on antiepileptic and neuroprotective activity of acetyl L carnitine (ALC), this study was undertaken to evaluate the preventive effect of ALC on structural changes in hippocampus in an experimental model of temporal lobe epilepsy.

Materials & Methods: In this study, 32 rats were divided into sham, ALC-pretreated sham, epileptic, and ALC-pretreated epileptic group. Rat model of epilepsy was induced by unilateral intrahippocampal administration of 4 μg of kainic acid per rat. Rats received ALC (100 mg/kg, p.o) daily for 3 days before surgery. Finally, brain sections were stained with Nissl and Timm methods.

***Results*:** The induction of epilepsy was followed by a prominent seizure and ALC pretreatment attenuated seizure intensity ($p<0.01$). In addition, density of Nissl-stained neurons in CA1, CA3, and dentate regions of hippocampus was significantly lower in epileptic rats versus sham group ($P<0.005$-0.001) and ALC pretreatment significantly increased it in CA1 and CA3 regions ($p<0.05$-0.01). Regarding mossy fiber sprouting, epileptic rats showed a higher degree of sprouting as compared to sham group ($p<0.005$) and ALC treatment significantly lowered it ($p<0.05$).

***Conclusion*:** ALC administration has an antiepileptic activity; it preserves neurons in CA1 and CA3 regions, and lowers mossy fiber sprouting in dentate gyrus of hippocampus in kainate-induced epileptic animals.

***Keywords*:** Acetyl L carnitine, Epilepsy, Seizure, Hippocampus, Neurodegeneration, Mossy fiber sprouting

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