Effect of repeated infancy anesthesia induced by Sodium Thiopental on GAD65 gene expression before maturation in Hippocampus of male Wistar rats

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Introduction. Exposure of the immature animal brain to anesthetics during the critical period of brain development triggers widespread apoptotic neurodegeneration and inhibits neurogenesis. A GABA mimetic drug such as Sodium Thiopental with excitatory effect of GABA in this period induces pathological effect on population or function of GABAergic cells due to influx of Ca2+. Glutamic Acid Decarboxylase enzyme 65 (GAD2) has a major role in the synthesis of GABA at the synaptic terminals. The aim of this study was to investigate the effect of repeated Thiopental administration in infancy on mRNA expression of GAD65 in hippocampus.

Materials and Methods. 4-day old male Wistar rats was divided in two groups as control (n=4) treatment (n=4). Thiopental (35 mg/kg) was injected (i.p) for an 11 days period from 4th to 14th after the birth. Saline was injected with equal volume with drug in control group. At the next day of last injection, the hippocampus was derived, then RNA extraction and cDNA synthesis was performed. Finally, RT-qPCR was done for all samples using specific primers.

Results. There were not significant differences in expression level of GAD65 gene in treated group compared with control group ($p>0.05$).

Conclusion. It has been reported that anesthetic drugs induce neurotoxic effect during synaptogenesis. Based on our findings, it can be concluded that expression of GAD65 was not affected immediately after 11 days injection of thiopental. Evaluation of GAD65 expression in next periods of life time is guaranteed for assessment of probable delayed effects of thiopental.

Keywords: Neonatal Anesthesia; Thiopental; GAD65 expression; Hippocampus; RT-qPCR