

Effect of frequent infantile Sodium Thiopental administration on GAD65 gene expression in 1.5 month old male wistar rats

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Introduction. Neural cell death in developing brain has been recognized as physiological process. Anesthetic drugs include stimulatory and inhibitory brain receptors during this period can cause devastating damage. Sodium Thiopental as a GABA mimetic drug can induce pathological apoptosis in GABAergic cells. GAD65 or Glutamic Acid Decarboxylase enzyme 65 (GAD2) is the most important enzyme in synthesis of GABA at the synaptic terminal. The aim of this study was to investigate the effect of repeated Thiopental administration in infancy on mRNA expression of GAD65 at 1.5 month after the birth in hippocampus of rats.

Materials and Methods. Eight 4-day old male Wistar rats were divided in two groups as control and treatment. thiopental (35 mg/kg), i.p. was injected to treatment group from 4th to 14th after the birth. in control group saline was injected with equal condition and volume with drug. At 1.5 month after the birth their Hippocampus was derived, then RNA extraction and cDNA synthesis was performed. Finally, RT-qPCR was done for all samples using specific primers.

Results. We observed a Significant down regulation in expression of GAD65 gene in treated group with thiopental in critical period of brain development in compared with control group ($p < 0.05$).

Conclusion. There are many evidences about neurotoxic effect of thiopental which can lead to neurological disorders. Results of present study showed a significant down regulation in expression of GAD65 in treated group in compared with control group. It thought that destructive effect of neonatal administration of thiopental on mentioned gene, according to its location and function, cause to abnormalities in synaptic transmissions which needs to clarify more.

Keywords: Neonatal Anesthesia; Thiopental; GAD65 expression; Hippocampus; Rat