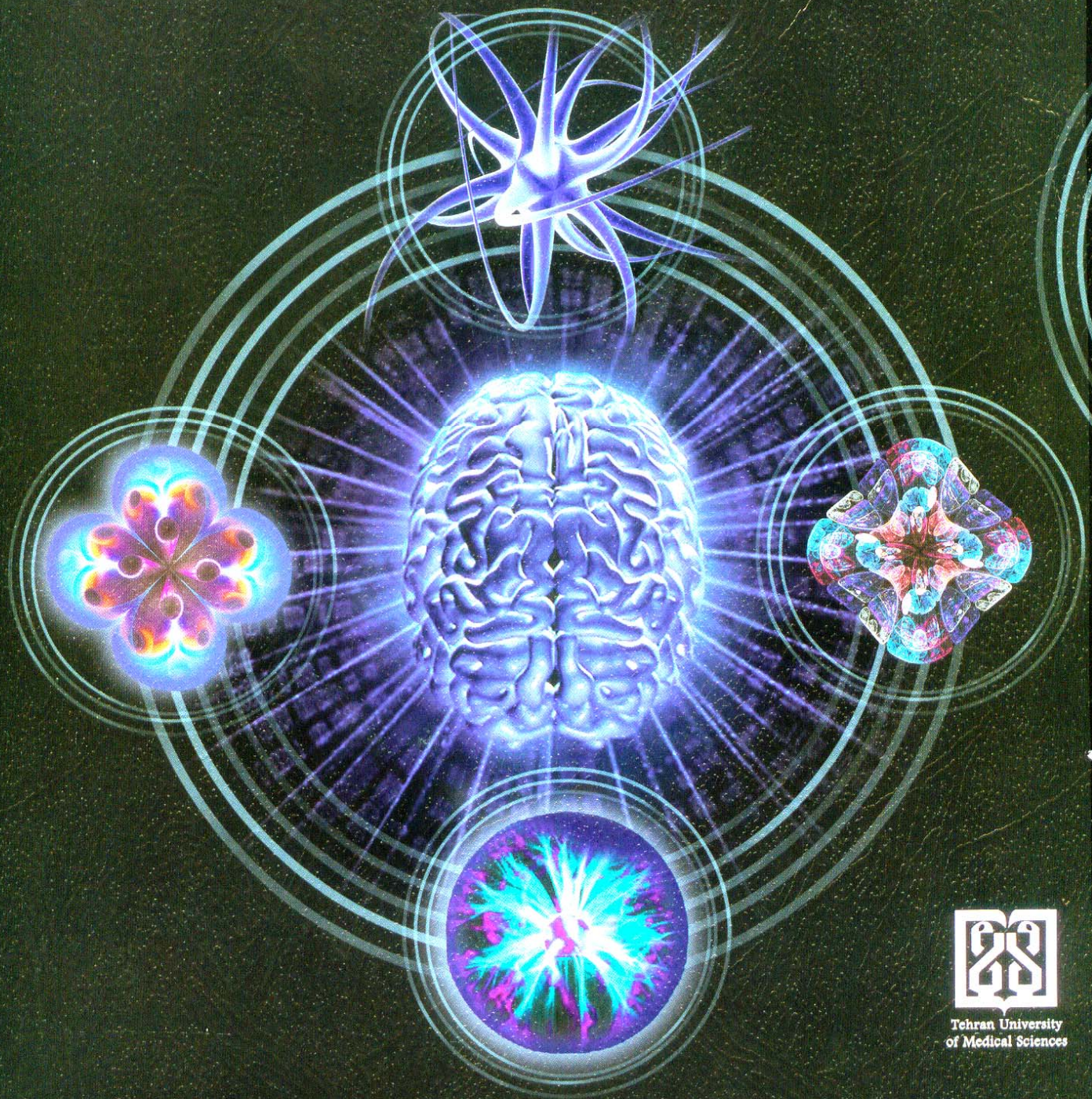


Abstract Book of

Basic and Clinical

NEUR  SCIENCE
Congress 2012

Tehran, Iran, Razi Convention Center 7-9 Nov. 2012



Tehran University
of Medical Sciences

Conclusions: Our results showed that mitochondrial biogenesis and antioxidant pathways are involved in AOS-mediated protection against H₂O₂-induced apoptosis cell death.

Keyword: Oxidative stress, Antioxidant response element, Mitochondrial biogenesis, Alginate oligosaccharide

Comparative effects of repeated anesthesia in infancy by thiopental on the learning process before and after maturation in Wistar rats.

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Introduction: Anesthetic drugs induce neurotoxic effects during synaptogenesis that cause long-term behavioral disorders. The aim of present study was to investigate the effects of repeated anesthesia by thiopental on Wistar rat's cognitive behavior.

Methods: Five-day old Wistar rats were randomly divided into 3 groups. Control, Sham (IP daily injections of saline) and Experimental group (30 mg/kg thiopental daily IP injections.) Anesthesia was continued for 4-5 hours per day in experimental neonate rats. In day 19, animals were subjected to Morris Water Maze to evaluate learning abilities during 5 days.

Results: The results of this study indicated a significant difference (P<0.001) in the learning abilities between Sham and Experimental groups, however, this difference was not significant before maturity, while it was statistically significant in mature animals (P<0.05)

Discussion: It has been reported that drugs affecting stimulatory or inhibitory brain receptors during critical development period of nervous system can cause devastating damages. Our results indicated that although thiopental did not show any damaging effect in newborn animals, it significantly reduced learning ability after maturity. Some behavioral and cognitive effects of anesthesia will occur in adulthood, although could not find in childhood periods.

Keywords: Neonatal Anesthesia, Thiopental, Morris Water Maze, Rats, learning

A Comparison between learning progress before and after maturation under the effect of repeated infancy anesthesia induced by thiopental in Wistar rats

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Introduction: Anesthetic drugs induce neurotoxin effects during synaptogenesis that cause long-term behavioral disorders.

The aim of present study was to investigate the effects of repeated anesthesia in neonate by thiopental on cognitive behavior.

Methods: Five-days neonates of Westar rat randomly divided into 3 groups (n=7). Control with no treatment, Sham (saline, i.p.) and Thiopental (30 mg/kg i.p.), injections were performed for 5 constitutive days, anesthesia was continued for 4-5 hours per day in Thiopental group. Infants in the day 19th, and parallel groups after maturation were subjected to Morris Water Maze to measure the time and distance for reaching the Plath form during the all 4 days of learning process.

Results: A significant reduction at time and distance during learning was seen as a marker of learning progress before and after maturity in all the groups (P<0.001) however, it was slower in the Thiopental group after maturation in contrast to control and sham animals (P<0.05)

Discussion: It has been reported that drugs which affecting stimulatory or inhibitory brain receptors during critical developmental period of nervous system can cause devastating damages. Although thiopental can show neurotoxin effect, its behavioral effects on spatial learning progress showed a decline just after puberty. Persistent effects of infancy thiopental repeated anesthesia may be interfaced with the spatial learning system but due to the significant plastic abilities of the neurons, it didn't affect the learning progress in the neonatal period.

Keywords: Neonatal Anesthesia, Thiopental, Morris Water Maze, Rats, Spatial Learning

Effect of repeated Thiopental neonatal anesthesia on memory retrieval before and after puberty in rats

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Introduction: Neurological disorders due to anesthesia in the immature animal models rise lots of questions about the overall human health regard to general anesthesia performance. Compounds which block the NMDA receptors or enhance effects of GABA in the critical period of growth, two days before the birth to day 14th after that, affect brain development and synaptogenesis. The aim of this study was to investigate the effects of repeated anesthesia induced by thiopental on memory retrieval.

Methods: Neonates of Westar rat with 5 days old were divided into 3 groups (n=7) of control (no treatment), sham (saline) and Thiopental (30 mg/kg), i.p. injections were performed for 5 constitutive days, anesthesia was continued for 4-5 hours per day in Thiopental group. Infants in the day 19th and parallel groups after maturation were subjected to Morris Water Maze for 4 constitutive days. Probe test performed at the 5th by which time spent in target quadrant was evaluated as memory recall criteria.

Results: There were not significant differences before and after puberty in memory retention criteria between animals in control, sham and animals which experienced repeated thiopental induced infant anesthesia.

Discussion: The results of our previous work showed that thiopental repeated anesthesia in infants can affect the learning process after maturation, but the results of the present study showed that the mentioned infant treatment had no effect on memory recall even after maturation, difference in the results may be related to the difference in the neuronal pathways underlying the learning progress and memory retention which needs to clarify more.

Keywords: Neonate, Anesthesia, Thiopental, Memory Retention, Rats