Different Concentrations of Ketamine did not Affect Cognition or Neurodegeneration in Adult Mice

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**Background:** Ketamine is used in clinic as an anesthetic and analgesic agent (1). However, little is known about the effects of the acute administration of this drug in brain of adult mice. The aim of this work was to study the effect of different concentrations of ketamine on cognition and its neurodegenerative effects.

**Methods:** Forty-eight mice males, inbred C57BL/6, with 28 weeks old, were divided into 4 different groups (I- saline, II-25 mg/kg ketamine (KET), III-75mg/kg KET, IV-150mg/kg KET). Drugs were administered intraperitoneally (i.p.). Twenty-eight animals (n=7 per group) were behavioral tested with the Radial-maze task (during 12 consecutive days after anesthesia). Number of reference memory and working memory errors and time to finish the test were checked. The remaining 20 animals (n=5 per group) were sacrificed 3 hours after anesthesia by cervical dislocation followed by decapitation and their brains analyzed by hematoxylin-eosin staining and caspase-3 activation to access neurodegeneration in the retrosplenial cortex, visual cortex, pyramidal cell layer from CA1 and CA3 areas of the hippocampus, and in the granular layer of the dentate gyrus. Death cells (H&E) and cells showing clear positive immunoreactions (caspase-3) were counted. Statistical analysis was performed using univariate ANOVA.

**Results:** No significant differences were detected between groups on the behavior performance of the Radial-maze (fig.1). These observations were supported by similar results with histopathological studies (H&E and caspase 3 activation).

**Conclusion:** This study showed no cognitive impairment or neurodegenerative differences induced by different concentrations of ketamine in the brain of adult mice.

**References:**

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**Figure 1**
Figure 1. Number of errors in radial-maze task during twelve consecutive days. Data showed as average ± standard deviation; n= 7. Group I- saline; Group II - 25mg/kg KET; group III- 75mg/kg KET; group IV- 150 mg/kg KET.