

Poster presentation

## Effects of NMDA receptor blockade in early developmental period on emotional behaviors in adult social isolated rats reared in physical barren and enriched conditions

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### Background

It is known that N-methyl-D-aspartate (NMDA) type of glutamate receptors in the brain play important roles in the development of neuronal migration, dendritic arborization and establishment of synaptic connections. Forasmuch, cognitive and emotional health is dependent of social and physical variety in rearing period.

### Materials and methods

The present study is investigate the effects of chronic NMDA receptor blockade in the last maturation period of the brain (between postnatal 10-20 days; 0.25 mg/kg MK-801, twice daily, s.c.) on the anxiety-like behaviors in social isolated (SI) rats that were reared in barren and enriched environments. Anxiety behaviors were evaluated by using an open-field (OF) and elevated plus maze (EPM) test in adulthood.

### Results

In the (OF), behaviors of the SI rats reared in enriched environment were characterized by increased upward exploratory behavior ( $P<0.05$ ) and decreased the number of fecal boli ( $P<0.05$ ), compared to the SI rats reared in barren environment. Blockade of NMDA receptors in SI barren and enrich reared rats resulted in increased ambulatory locomotion without changing all other OF behaviors, compared to the saline treatment. In the EPM, when reared in enrich environment, SI rats with saline treatment showed decreased anxiety state, expressed as a significant decrease in the time spent in open arms ( $P<0.05$ ) and an

increase in time spent in the close arms ( $P<0.05$ ) with increases in ethological type of exploratory behaviors (head stretched,  $P<0.05$ ; upward exploratory behavior,  $P<0.001$ ; and self-grooming  $P<0.05$ ), compared to the SI rats reared barren environment. NMDA receptor blockade attenuates the effects of physical enrichment in the EPM.

### Conclusions

These findings indicate that NMDA receptor blockade in the last maturation period of brain development is implicated in forming multiple associations with environment.

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