Conclusions

- Basal extracellular levels of cortical glutamate are significantly higher in adolescent animals compared to adults
- Ethanol has a prominent biphasic effect on glutamate release in adolescent animals but not in adults
- Ethanol modulates the clearance rate of glutamate from the extracellular space

Introduction

Alcohol addiction is associated with dysfunctional glutamatergic neurotransmission in the prefrontal cortex (PFC). Long-term psychological and short-term pharmacological effects of alcohol inhibit PFC function causing abnormal maturation of the PFC if consumed during adolescence and thereby increasing the risk of alcohol addiction. We investigated the effects of systemic alcohol on glutamate dynamics in the rat PFC using enzyme based microelectrode amperometry.

Results

I. Cortical glutamate levels decrease with age

II. Spontaneous glutamate release or glutamate transients during in vivo recordings

III. Glutamate transients and biphasic effects of ethanol on glutamate transients in adolescent animals

IV. Ethanol modulates clearance rate of glutamate from extracellular space

References


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