

Stimulant effects of ethanol in adolescent Swiss mice: development of sensitization and consequences in adulthood

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Introduction

The adolescent period is characterized by behavioral and neurobiological changes. These changes could predispose adolescents to experiment with alcohol, and to be particularly vulnerable to the long-term consequences of its use, such as increased risks of later dependence when drinking is initiated early.

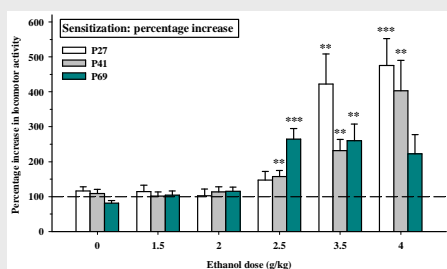
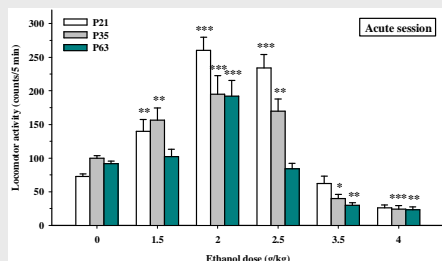
Hypothesis: adolescent vulnerability to alcohol is partially explained by an altered sensitivity to chronic ethanol-induced neuroadaptations.

→ **Aims:**

- investigation of potential differences in the development and expression of sensitization to the stimulant effects of various ethanol doses in female Swiss mice
- characterization of changes in sensitivity to the stimulant effects of ethanol in adult female Swiss mice with a history of chronic alcohol intoxication during adolescence.

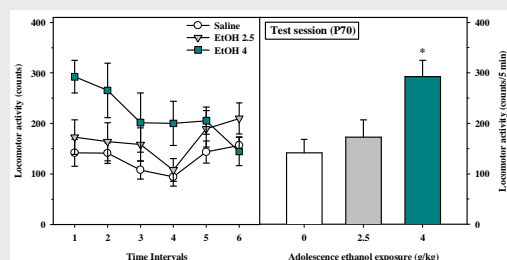
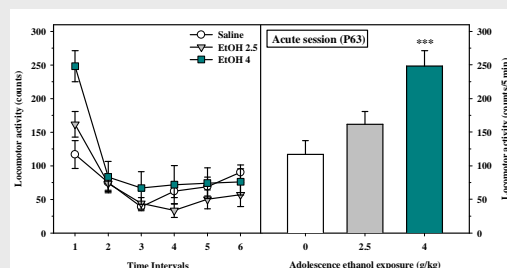
Ontogeny of sensitization

- P21, P35 and P63 female Swiss mice (P=post-natal day)
- Ethanol doses: 0, 1.5, 2, 2.5, 3.5, 4 g/kg
- 7 daily administrations (i.p.)
- Sessions: acute and sensitization (locomotor activity during 30 minutes)



Consequences in adulthood

- Chronic exposure to ethanol during adolescence: 14 daily injections (i.p.) from P28 to P41 of 0, 2.5 or 4 g/kg ethanol
- Reexposure to ethanol (adulthood):
 - Acute session at P63: 2.5 g/kg ethanol
 - 6 daily injections of 2.5 g/kg ethanol
 - Test session: at P70: 2.5 g/kg ethanol



Conclusions

Younger mice are more sensitive to the stimulant effects of acute ethanol, but require higher ethanol doses to develop sensitization. However, when sensitization develops, younger mice reach sensitized stimulant effects that are much higher than in adults. Adolescent mice develop very strong ethanol sensitization at doses that mimic binge drinking in humans.

Moreover, repeated ethanol exposure during adolescence induces long-lasting effects, with higher ethanol stimulant effects in adulthood.