

Gradual changes in the sensitivity to the stimulant and sedative effects of ethanol during adolescence in Swiss mice.

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Introduction

The adolescence is a unique period of development, 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 a specific sensitivity to its behavioral effects.

- **Aims:**
- Characterization of the development of the sensitivity to the stimulant and sedative effects of ethanol across the different phases of adolescence.
 - Characterization of the dose-response curves for its stimulant effects in each age group.

Methods

Subjects:

480 female Swiss mice
Ranging from weaning to the entrance to adulthood: P21, P28, P35, P42, and P60 (P=post-natal day)

Stimulant effects:

0, 1, 1.5, 2 and 2.5 g/kg EtOH (i.p.)
Locomotor activity during 30 minutes

Sedative effects:

4 g/kg EtOH
Duration of the LORR

Locomotor effects of high doses:

In P21, P35 and P60 mice
0, 2.5, 3, 3.5 and 4 g/kg EtOH (i.p.)
Locomotor activity during 30 minutes

Results

Fig.1: Stimulant effects

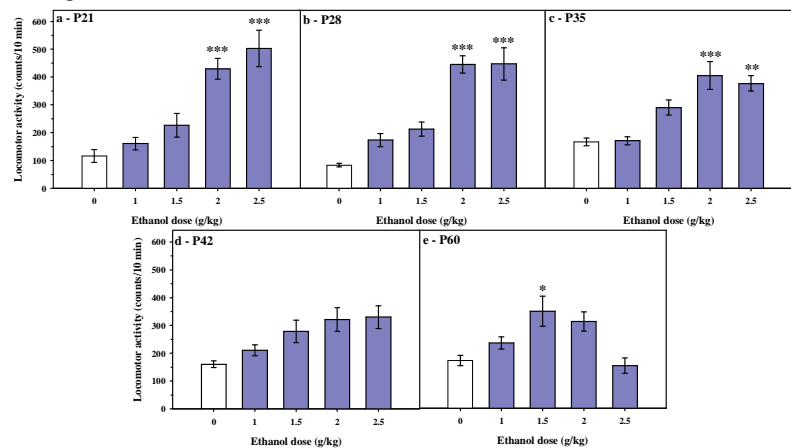


Fig.2: Acute effects of ethanol : locomotor effects induced by 2.5 g/kg (a) and sedative effects (b)

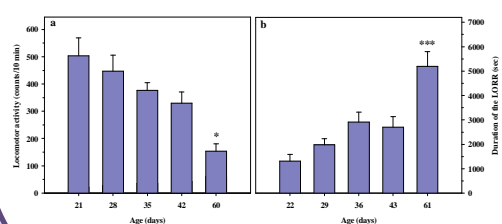
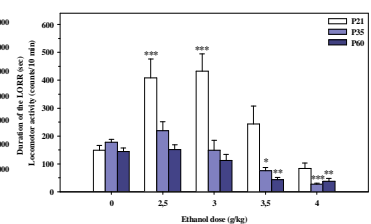


Fig. 3: Locomotor effects induced by high ethanol doses



Conclusions

Changes in the sensitivity to the acute behavioral effects of ethanol from weaning to early adulthood are **gradual**:

- Gradual decrease in the sensitivity to the stimulant effects
- Gradual increase in the sensitivity to the sedative effects
- Progressive changes in the dose-response curve during development

Adolescents are characterized by a pattern of ethanol effects allowing high consumption of alcohol

→ Partial explanation of the increased vulnerability of young drinking individuals