

Introduction

Acetaldehyde (ACTH), the first product of ethanol metabolism, has been suggested to play a role in many pharmacological and behavioral effects of ethanol. However, very few studies have investigated the role of acetaldehyde in the amnesic, ataxic and hypothermic effects of ethanol.

The **aim** of the present studies was to compare the profiles of ethanol and acetaldehyde in several behavioral tests in order to better understand the role of acetaldehyde in ethanol-induced amnesia, ataxia and hypothermia.

Methods

Subjects:

214 female Swiss mice (8 weeks)

Ataxic effects:

Doses : 0, 1.5 and 2.5 g/kg EtOH (i.p.) ; 0, 170 and 300 mg/kg ACTH (i.p.)

Measurement of fall latency in the accelerated rotarod test (4.0 to 40 RPM)

Amnesic effects:

Doses : 0, 1, 2, 3 and 4 g/kg EtOH (i.p.) ; 0, 56, 100, 170 et 300 mg/kg ACTH (i.p.)

Measurement of step-through latency in the passive avoidance test

Hypothermic effects:

Doses : Saline, 170 and 300 mg/kg ACTH or 3 g/kg EtOH (i.p.)

Measurement of rectal temperature at various time points after the injections

Results

Fig.1: Ataxic effects of ethanol (a) and acetaldehyde (b)

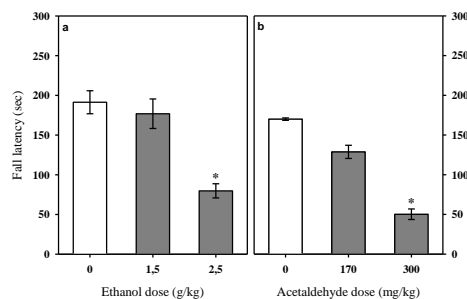


Fig. 2 : Amnesic effects of ethanol (a) and acetaldehyde (b)

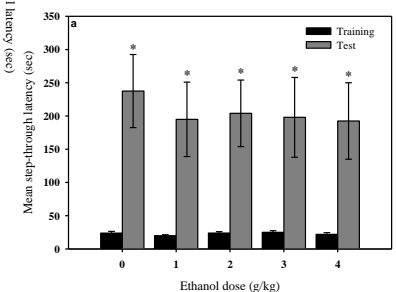
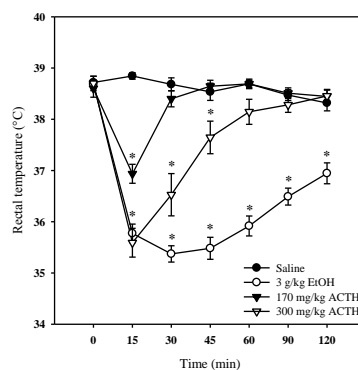


Fig. 3 : Hypothermic effects of ethanol and acetaldehyde



Conclusions

- Significant **ataxic** effects of both acetaldehyde and ethanol were observed in the accelerating rotarod test.
- Acetaldehyde induced significant **hypothermic** effects, but of shorter duration than ethanol-induced hypothermia.
- Acetaldehyde dose-dependently impairs **memory** consolidation while ethanol does not alter the process of memory consolidation in the passive avoidance test.

Overall, the results of the present study clearly show that acetaldehyde, like ethanol, has ataxic and hypothermic properties in mice at least at relatively high concentrations and suggested that acetaldehyde plays a role in these effects of ethanol. In contrast, the dissimilarity of ethanol and acetaldehyde memory effects indicates that acetaldehyde induces much higher amnesic effects than ethanol itself.