

# Adolescent Alcohol Binging : A Predictive Factor of Drug Vulnerability?



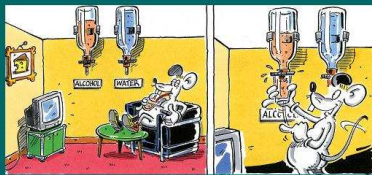
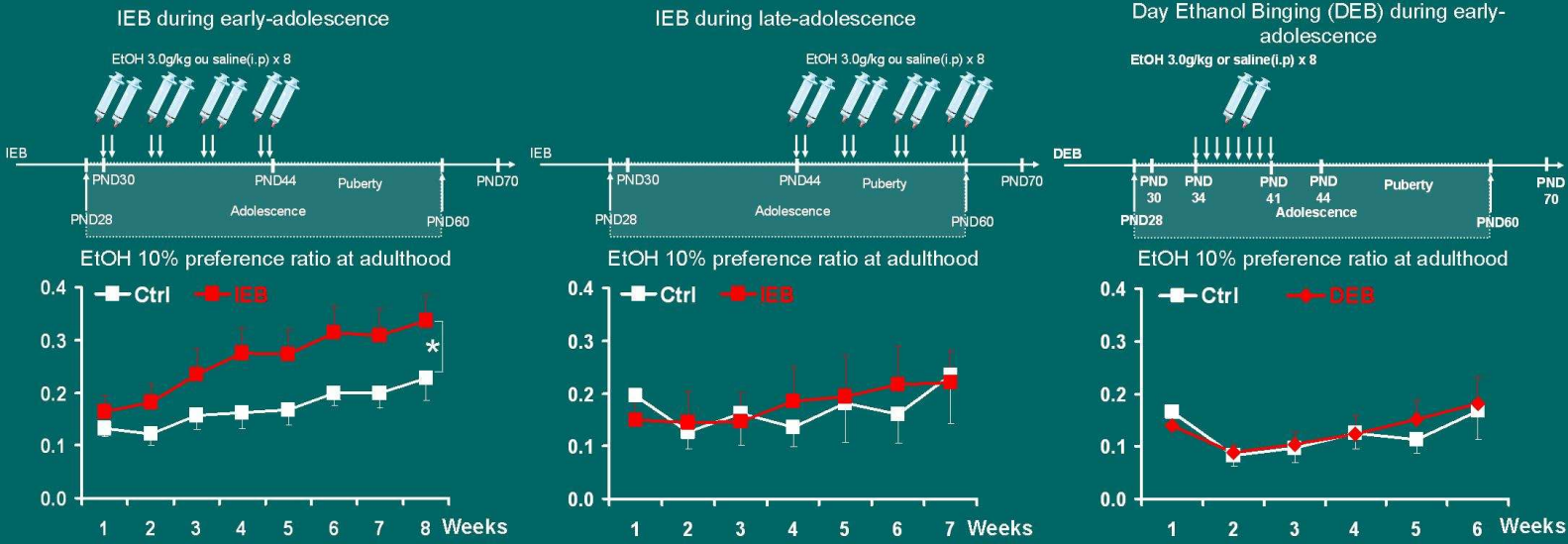
Warnault V\*, Alaux-Cantin S\*, Vilpoux C\*, Pierrefiche O\*, Naassila M\*.

\*Equipe region INSERM (ERI24), Groupe de recherche sur l'alcool et les pharmacodépendance (GRAP), Université de picardie Jules Verne, UFR de Pharmacie, 1 rue des Louvels, 80037 Amiens.

**Rational:** Clinical and epidemiological data revealed that alcohol abuse become widely common in adolescent people. This early alcohol consumption is a real public health problem because that could increase the risk to develop alcohol dependence. Indeed, early alcohol onset (< 14 years-old) increase by 4-5 times the risk to become addict to alcohol during adulthood comparatively to late onset (> 14 years-old). The second worrisome aspect is the mode of adolescents alcoholization, it's the binge drinking that consists in consuming large amounts of alcohol in a relatively short period of time (≥ 4 ou 5 drinks per occasion respectively in women and men). Binge drinking concern around 50% of 17 years-old (ESCAPAD 2008). In spite of this alarming data the long term consequence of binge drinking on later drug vulnerability stay relatively unknown.

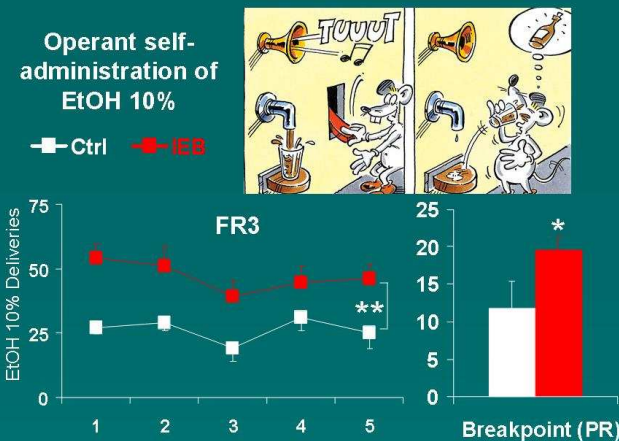
A large number of preclinical studies tested the ontogenetic difference for ethanol sensitivity. In contrast, insufficient animal researches have investigated the key role of ethanol (EtOH) exposure during adolescence in later abuse liability. For this reason, the aim of the present preclinical study was to further explore in rat the potential vulnerability to EtOH abuse after an exposure to intermittent binge-like EtOH exposure (IEB) during adolescence (PND28-60). Specifically, we analyzed in rats male exposed to IEB during adolescence their later EtOH consumption and motivation to drink EtOH, the motivational's properties of EtOH in two conditioning paradigms

## Effects of IEB during adolescence on EtOH 10% preference ratio at adulthood (non-operant selfadministration two bottles choice)

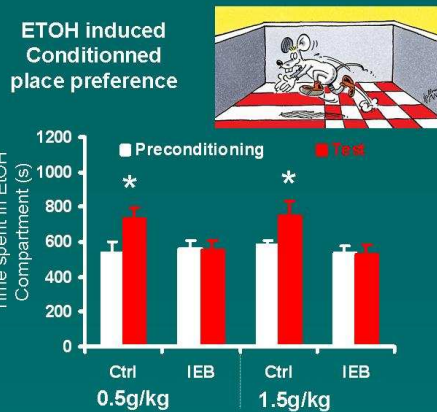


IEB increase significantly later preference for EtOH 10 % only when it was done during early-adolescence. Interestingly, as demonstrated by the epidemiological studies, our results show that EtOH bingeing specifically during early-adolescence may actually represent a "vulnerability" factor, revealed by the increase in voluntary consumption and operant self-administration of a 10% EtOH solution.

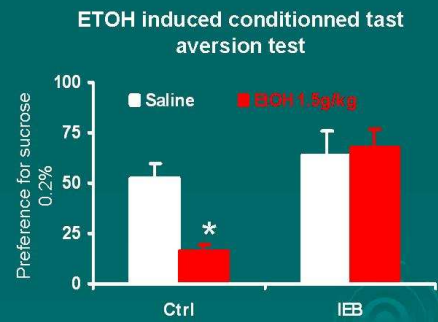
DEB did not modify propensity to consume EtOH 10% at adulthood demonstrating that the pattern of bingeing could be more relevant than the level of ETOH intoxication.



IEB during early-adolescence increased later rat motivation to self-administrate EtOH 10%. IEB rats were able to work more for obtain one dose of EtOH 10% (0.1ml).

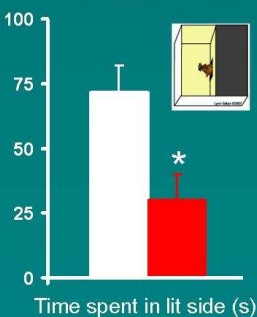


EtOH did not induce place preference at adulthood after early-adolescence IEB exposure. IEB rats are less sensitive to reward properties of EtOH (positive value of EtOH). The decrease in EtOH's rewarding actions revealed an increase in the reward threshold may also enhance their consumption, because IEB rats need to consume a more important quantity of ethanol before feel its positive value.



EtOH did not induce taste aversion for the solution of sucrose 0.2% in adult IEB rats. In this regard, the decrease in sensitivity to EtOH's aversive actions by IEB exposure may enhance oral consumption; because animals can intake a more important amount of ethanol before feel its negative value.

## Effects of Adolescent IEB exposure on basal level anxiety like behaviour (Light/Dark box , 200 lux)



We found that IEB rats display a more anxious-like phenotype that may, at least in part, explain their increased propensity to drink EtOH. Because, it was shown in clinical study that drinking to cope is a pervasive practice in individuals with social anxiety and drinking for coping motives is associated with risk of developing EtOH problems.

## Conclusion :

As observed in humans, our data confirm that early adolescence is a window of vulnerability regarding the long term effect of binge-like EtOH exposure on later liability to alcohol abuse and anxiety-like behaviour.

This should be considered in conducting specific alcohol policies to fight against the early life initiation of alcohol consumption and binge drinking.