

## Vulnerability to alcohol operant-drinking behaviour: implications of environmental stimuli

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Environmental stimuli, occurring early in life, shape the drinking trajectories and the psychopathological outcome of alcohol consumption in adult life. In particular, early perinatal procedures can permanently alter various patterns of drug use and behaviour in rat adulthood (Pryce CR, 2001). Early handling (EH) apparently is responsible for neurochemical and behavioural changes in adulthood, due to boosts in maternal care after daily reunion. It has been suggested that fostered maternal care, in the form of licking and grooming, is a key feature in determining neural changes and offspring fear responses and alter the reward/reinforcement pathway through epigenetic mechanisms that likely underlie remodeling in DA transmission (Francis, 2008, Francis et al., 2002). Such evidence is important, since fear together with stress, is thought to be related to vulnerability associated with drug abuse (Kreek and LaForge, 2007; Sinha and Li, 2007). Various studies on ethanol consumption and preference, showed less vulnerability to ethanol in adult male rats submitted to EH procedure (Ploj K, 2003).

Based upon these findings, this study was aimed at examining the impact of brief early handling, 15-minute daily separations of litters from the dams during the first 2 weeks of life, on vulnerability to heavy drinking and dependence in adult male Wistar rats employed an operant self-administration procedure well known as a valid paradigm, highly predictive of drug-seeking and drug-taking behaviour in rats (Higgins et al., 1994).

The operant-drinking behaviour protocol consisted of: 1) Training phase in which the animals learnt to self-administer EtOH 10% over 21 days; 2) Extinction phase during which reward delivery was suspended; 3) Deprivation period when ethanol self-administration was suspended for 7 days to achieve a forced abstinence; 4) Relapse phase, 7 days, to assess animal reinstatement for ethanol (Cacace, 2012).

Our data revealed that EH procedure has a protective influence towards the onset and escalation of drug abuse, showing a reduction in addictive behaviour as displayed by a lower frequency of lever presses with respect to control group. These findings further corroborate the role of early life experiences on ethanol consumption in adulthood, highlighting that environmental influences may induce individual different responses to drug abuse.

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