Differential Effects of Stress on Alcohol-related Behaviours in Moderate and Heavy Social Drinkers

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Introduction

◊ Stress plays an important part in the aetiology of alcoholism and is thought to facilitate alcohol-related behaviours via activation of the positive incentive system.1
◊ Pre-clinical studies have demonstrated that the activation of the incentive system by alcohol undergoes sensitisation after chronic use2 and clinical studies revealed that drinking in response to stress positively correlates with the habitual level of alcohol use.3

Methods

Subjects
16 male and 16 female heavy social drinkers, aged 18-31, consuming 27.5-90.3 alcohol units/week were randomly assigned either to the stress or the non-stress condition (counterbalanced for gender).

Gender-based median split:
- Moderately heavy drinkers [MD] - consuming 27.5-43.4 units/week
- Very heavy drinkers [HD] - consuming 36.1-90.3 units/week

Stress induction

Non-stress procedure Stress procedure
instructions (2min) instructions (2min)
viewing an art history book (6min) preparing a speech for a fictional job interview (6min)
further instructions (1min) further instructions (1min)
assessing 10 paintings (6min) delivering the speech (5min)
completing a dot-to-dot picture booklet (6min) mental arithmetic (5min)

Questionnaires

Trait measures
- Temperament and Character Inventory (TCI)
- Alcohol Expectancy Questionnaire (AEQ)

Mood measures
- Profile of Mood States (POMS)
- KUSTA

Assessment of drinks
- Visual Analogue Scales (VAS)

Physiological measurements
- Salivary cortisol (CORT)
- Blood alcohol level (BAL)

Alcohol consumption procedure
- Beer, red wine, white wine or vodka & orange

Cognitive test

Stroop test (colour naming)
Word lists:
- Alcohol-related (ALC)
- Positive emotional (POS)
- Negative emotional (NEG)
- Neutral (stationery)

Experimental protocol

Results

Subjects
HD participants had higher Novelty Seeking and Impulsivity scores and lower expectancy of alcohol-related cognitive and behavioural impairment.

Mood & Cortisol
Stress induction increased Anxiety and Tension and prevented diurnal decrease in cortisol secretion. Alcohol consumption decreased Anxiety, Anger and Tension and increased Friendliness in most participants. The two drinking groups did not differ in terms of their mood or cortisol reactivity.

Alcohol consumption and assessment of drinks
When stressed, HD participants consumed more drinks and rated them as more pleasant than the MD participants. Stress appeared to suppress liking and consumption of alcohol only in the MD group.

Conclusions

◊ Stress increases sensitivity to negative emotional context in individuals who habitually drink very heavily and this may contribute to increased liking and consumption of alcoholic drinks observed after stress in this group of social drinkers.
◊ Stress inhibits incentive value of alcohol in less impulsive individuals who do not yet drink excessively.

3 Cooper et al., 1992. J Abnorm Psychol 101, 139-1504
4 Nesic & Duka 2006, Pharmacol Biochem Behav 83, 239-248

This research was funded by an Overseas Research Studentship for postgraduate studies. The presentation of this poster is supported by an ECNP Travel Award.