

Influence of Family History of Alcoholism on the Analgesic Effects of Alcohol in Social Drinkers

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BACKGROUND/SIGNIFICANCE

- A substantial proportion of chronic pain patients endorse self-medication of pain with alcohol
- Self-medication of pain with alcohol is associated with risk for development of alcohol use disorder
- Alcohol consumption has been shown to produce clinically-relevant reductions in experimental pain paradigms
- Family risk for alcoholism may be associated with greater pain sensitivity
- Alcohol may act as a more potent negative reinforcer for these individuals
- This study investigated the acute analgesic effects of a sub-intoxicating dose of alcohol in healthy social drinkers
- Family history of alcoholism was assessed as a potential moderator of the pain-relieving effects of alcohol using a laboratory heat pain paradigm

METHODS

- Participants were 12 healthy social drinkers (50% women)
- Before testing, participants completed questionnaires regarding demographics, typical drinking behavior, family history of alcoholism, and alcohol expectancies
- Participants were given either placebo or moderate alcohol (.065 g/dL target breath alcohol concentration, or BAC) counterbalanced over two testing sessions
- All beverages were misted with alcohol to enhance placebo efficacy
- After absorption, a slow ramping heat stimulus was applied to the volar surface of the forearm for 3 trials
- Heat stimuli were applied in non-overlapping areas of the forearm to avoid sensitization
- Participants verbally indicated when the heat stimulus became painful (threshold) and intolerable (tolerance)
- Participants used a 10cm visual analog scale (VAS) to rate pain intensity 15 seconds after thermode removal
- Main and interactive effects of alcohol dose and family history of alcoholism on pain threshold and tolerance were analyzed using repeated measures ANCOVA, controlling for expectancy of pain relief.

PARTICIPANT CHARACTERISTICS

	FH+ (n=5) Mean (SD)	FH- (n=7) Mean (SD)
Screening Measures		
Demographics		
Age (years)	36.80 (7.26)	28.43 (3.91)
Education (years)	17.25 (3.10)	17.71 (2.98)
Affective Measures		
BDI-II (total score)	3.20 (5.07)	3.57 (3.87)
State Anxiety Index (total score)	29.20 (5.26)	23.43 (2.76)
Trait Anxiety Index (total score)	33.00 (9.27)	29.57 (8.62)
PILL (total score)	39.80 (22.99)	35.86 (25.75)
Alcohol Use Measures		
QFI (oz. abs. EtOH/day)	0.57 (0.30)	0.65 (0.57)
Max QFI (oz. abs. EtOH)	2.88 (.75)	5.59 (3.57)
AUDIT (total score)	5.20 (2.05)	5.71 (1.25)
Expectancy of Pain Relief (-10 to 10)	4.80 (4.44)	-1.57 (6.08)
Alcohol Session		
Peak BrAC (g/dL)	0.051 (0.011)	0.053 (0.011)
Subjective Intoxication (0-10 VAS)	2.20 (1.64)	4.55 (1.78)
Perceived Pain Relief (0-10 VAS)	1.77 (1.99)	3.13 (2.90)
Pain Threshold (°C)	44.67 (1.64)	44.93 (1.75)
Pain Tolerance (°C)	48.45 (1.20)	48.56 (1.54)
15s Aftersensation (0-10 VAS)	0.39 (1.24)	0.83 (0.70)
Placebo Session		
Subjective Intoxication (0-10 VAS)	0.06 (0.13)	0.49 (1.07)
Perceived Pain Relief (0-10 VAS)	0.05 (0.10)	1.22 (1.67)
Pain Threshold (°C)	44.16 (2.96)	43.79 (2.62)
Pain Tolerance (°C)	48.08 (1.70)	48.36 (1.58)
15s Aftersensation (0-10 VAS)	1.60 (1.82)	.31 (0.29)

PAIN THRESHOLD AND TOLERANCE

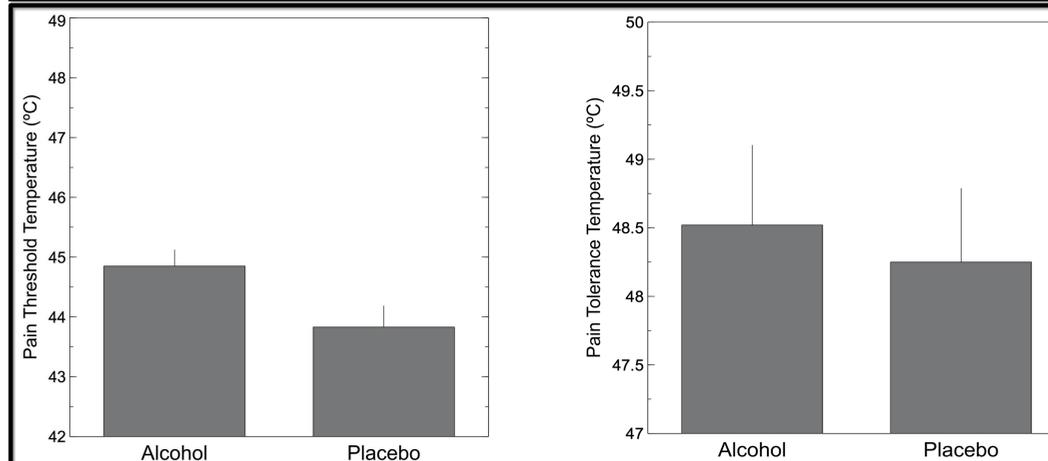


Figure 1. Bar charts illustrating a) a main effect of alcohol intake on pain threshold across participants ($F_{1,5}=8.30$, $p=.035$; Cohen's $d_z=1.18$); and b) a non-significant effect of alcohol on pain threshold ($F_{1,9}=1.87$, $p=.21$; Cohen's $d_z=.37$). No interactions of dose and family history were detected. Error bars reflect standard error of the mean.

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AFTERSENSATION RATINGS

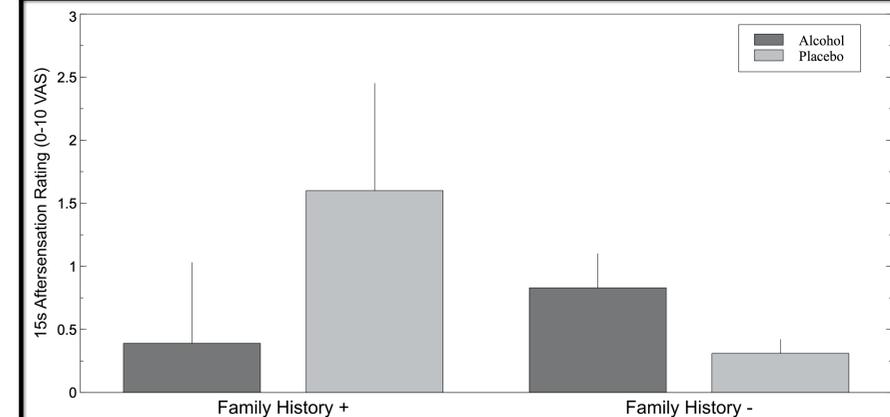


Figure 2. Bar chart illustrating a significant interaction of FH and alcohol dose on 15s aftersensation ratings ($F_{1,8}=8.24$, $p=.02$; $\eta^2_p=.51$). FH+ participants gave a significantly lower 15s AS rating when given alcohol ($M_{alc}=0.39$) vs. when given a placebo ($M_{plac}=1.60$; $p=.02$; Cohen's $d_z=1.10$). The FH- group showed an opposite trend ($M_{alc}=.83$ vs. $M_{plac}=.31$; $p=.18$; Cohen's $d_z=.91$).

DISCUSSION

- Family history of alcoholism did not appear to moderate the effect of moderate alcohol on pain threshold/tolerance
- An interactive effect of dose and family history of alcoholism was detected for 15s aftersensation ratings
 - FH+ participants, but not FH-, had significantly lower 15s aftersensation ratings with alcohol vs. placebo
- Alcohol may serve as a stronger negative reinforcer in FH+ individuals due to more potent dampening aftersensation
 - Aftersensation has been interpreted as a measure of central sensitization and pain modulation relevant to the development and maintenance of chronic pain
- These preliminary results warrant systematic investigation using a larger sample
- Future research should investigate the interaction of alcohol dose and family history on pain aftersensation ratings for other novel pain stimuli (e.g. musculoskeletal pain)

RELATED READINGS

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