

Title: Chew on this: does alcohol withdrawal change stress-induced displacement behavior (gnawing) in adolescent and adult rats?

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Research in our laboratory is aimed at identifying factors that contribute to increased alcohol consumption and vulnerability for alcohol abuse using a rodent model. Currently, we are exploring the hypothesis that withdrawal from alcohol will lead to dramatic changes in behavior in female rats, including increases in active/reactive coping strategies when faced with stressors. We have been focused on females, as there is a dearth of information regarding female sensitivity to alcohol withdrawal during adolescence, and some studies would suggest that females may be more likely to exhibit active coping responses. This hypothesis was explored in the present study using female adolescent (P30 2) and adult (P75 1) Sprague-Dawley rats (N = 32) bred and reared here at Ithaca College. To do this, rats were exposed to intragastric (IG) intubation of alcohol (20%) or tap water once per day for three days. Immediately thereafter, animals were given two days of rest where they remained non-manipulated. This pattern of exposure was repeated for 3 more cycles. Following the final water or alcohol intubation (24 hours), stress exposure began. Rats were placed in Plexiglass restraint tubes and were presented with a wooden stick (made of balsa wood) during the stress period. They remained in restraint for 45 min, with their behavior (time spent chewing) recorded for later analysis. Results demonstrated that, contrary to our hypothesis, alcohol withdrawal did not increase active coping behavior during restraint, as measured by duration of chewing. There was a trend, however, for rats experiencing withdrawal to chew less than the water controls during the first half of the stress session. As the session progressed, this group difference was no longer apparent, and thus overall there was no significant effect of alcohol withdrawal. Stress testing was repeated for 4 more additional days. These data are currently being analyzed to determine whether alcohol-exposed rats exhibited significant differences in habituation to the restraint stress with repeated exposures. Given that alcohol withdrawal has been shown in previous studies to result in marked changes in behavior in rodents, the results of this study were unexpected. In fact, our data would indicate that, if anything, rats were exhibiting reductions in active coping during withdrawal. Since our control animals were repeatedly intubated with tap water, we cannot exclude the possibility that this administration procedure was in and of itself a chronic stressor that affected the rats' responsiveness to restraint stress. Thus, future experiments in our laboratory will be aimed at exploring this possibility. Furthermore, these results were obtained exclusively from female animals, and we plan to explore potential sex differences in this behavioral response.