

Ethanol and Corticosterone Administration on Adolescent Drinking and Febrile Response in Male Sprague-Dawley Rats

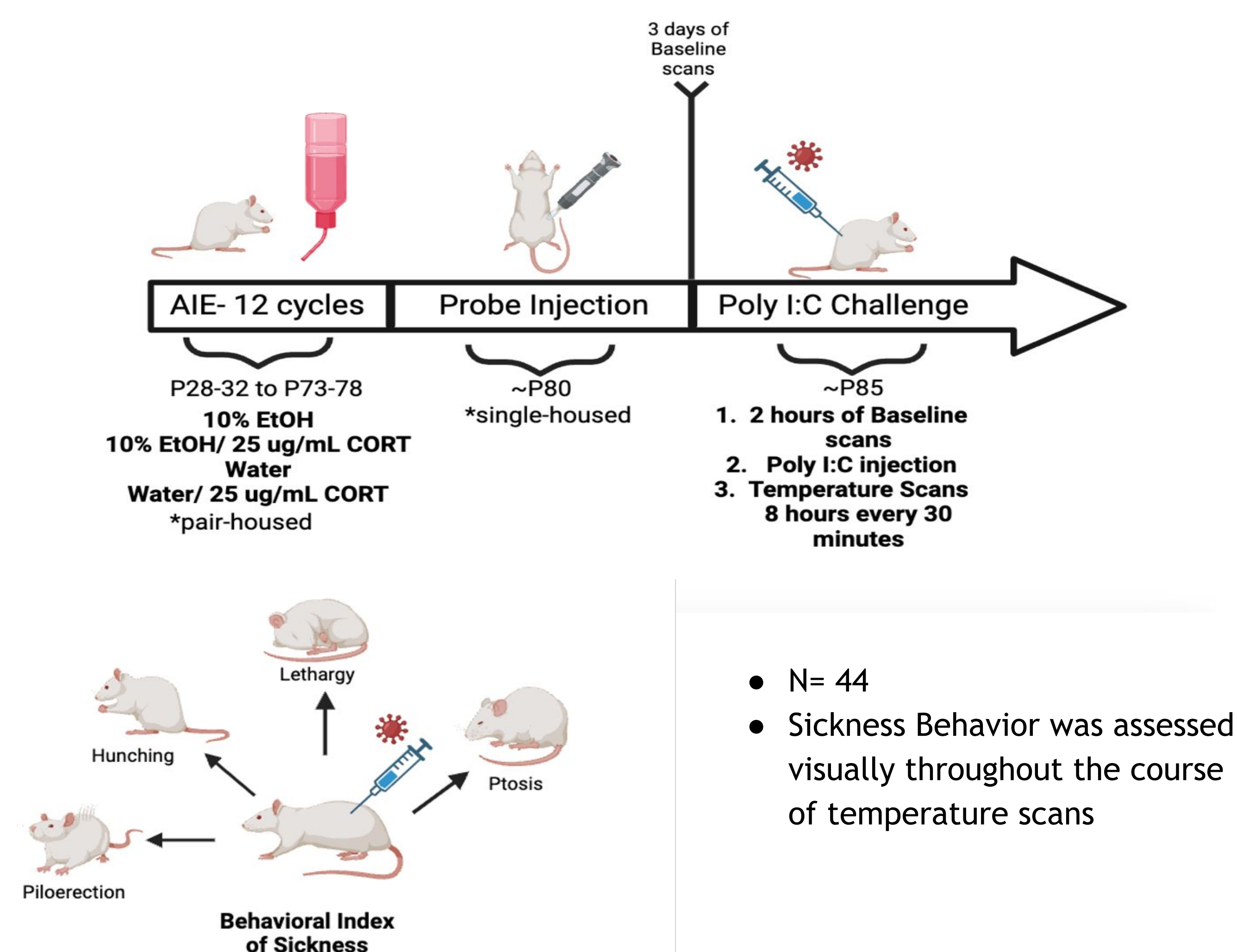
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Introduction

- Adolescents often exhibit distinctive behavioral responses to alcohol, such as resistance to the sedative effects and increased sensitivity to its positive, reinforcing effects (Monti et al., 2015)
- Glucocorticoids have been shown to have a bi-directional relationship with ethanol, such that they can modulate drinking behavior, while also impacting the immune system by promoting anti-inflammatory or pro-inflammatory effects (Barney et al., 2022; Cruz-Topete & Cidlowski, 2014).
- Previous lab experiments found under adolescent intermittent ethanol exposure (AIE), in adulthood, males exhibited a sensitized immune response to Poly I:C (Gano et al., 2024).
- The goal of this study was to examine:
 - Co-administration of corticosterone (CORT) and ethanol during adolescence in male rats and its impact on consummatory behavior
 - If co-administration of CORT and ethanol impacted febrile response to Poly I:C in adulthood
- Hypotheses:**
 - 1) Co-administration of CORT and ethanol enhances ethanol consumption in adolescence
 - 2) Adolescent exposure to CORT and ethanol will exacerbate febrile response in adulthood

Methods



Acknowledgements

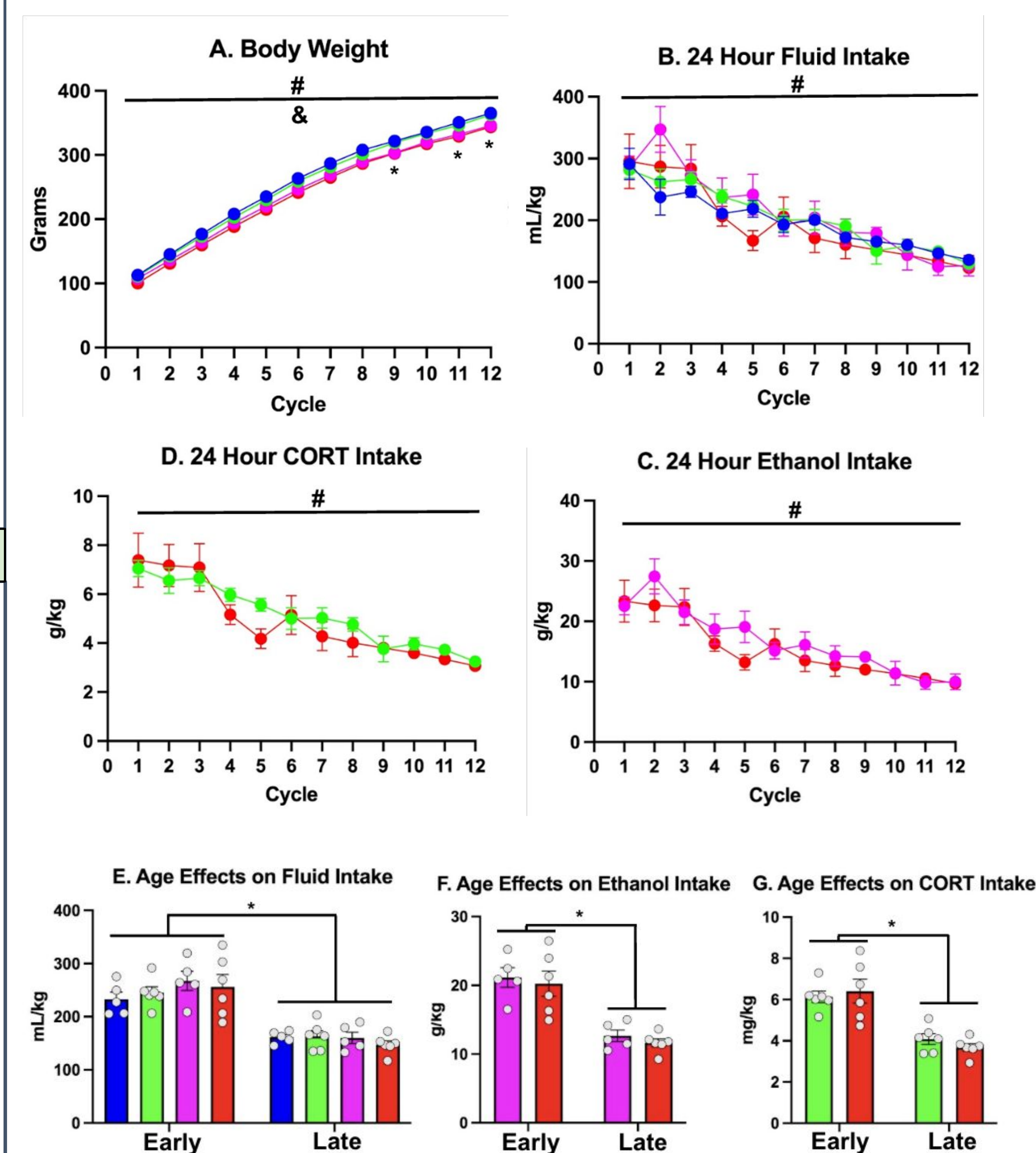
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Results

Experiment 1: Adolescent Intermittent Ethanol Exposure in forced drinking paradigm.

- 10% EtOH
- 10% EtOH/25 ug/mL CORT
- Water
- Water/25 ug/mL CORT

#: $p < 0.0001$
&: $p < 0.001$,
*: $p < 0.0001$

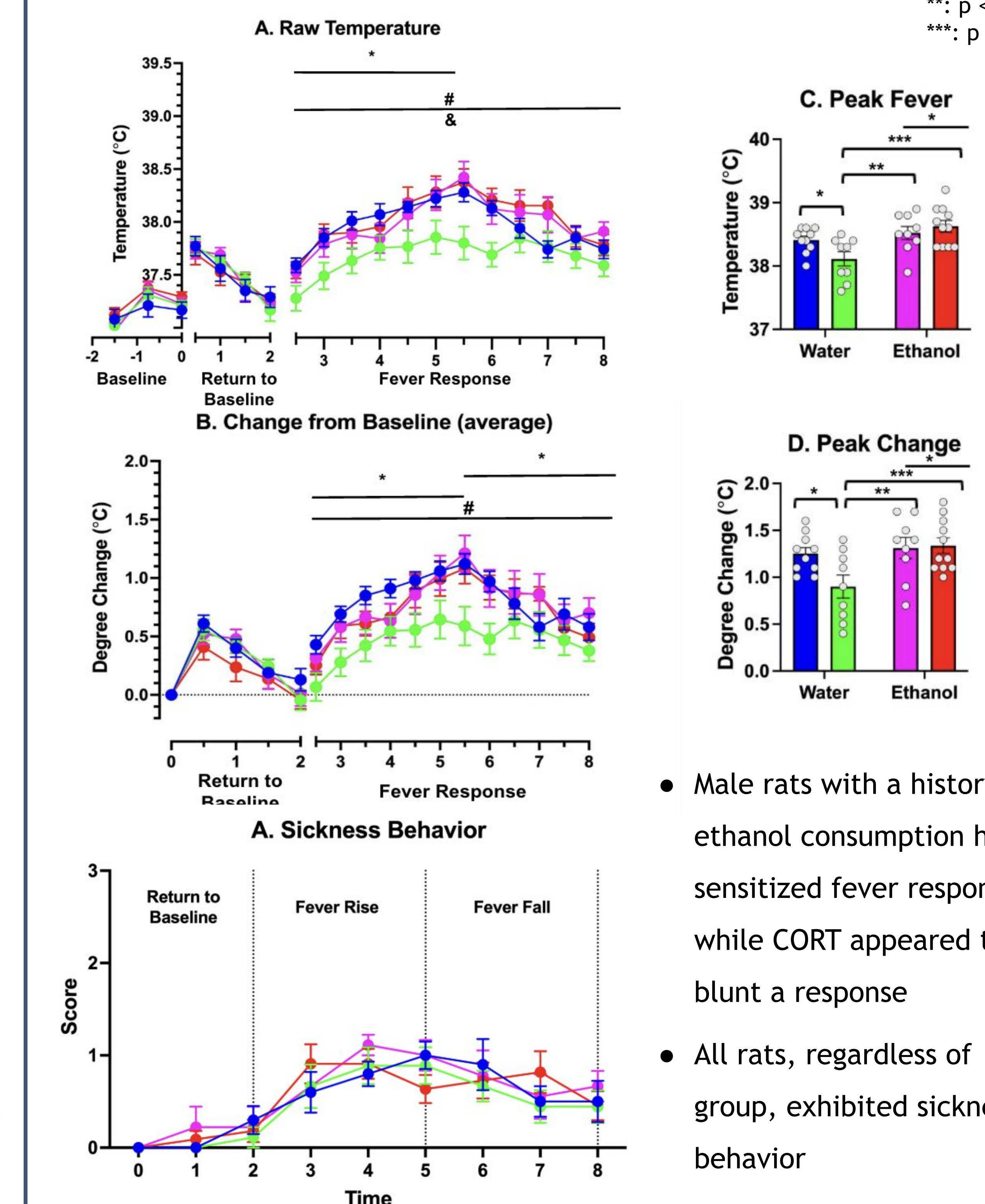


- Fluid intake decreased across all groups as cycles progressed
- Rats consumed more fluid during early cycles as compared to later cycles
- EtOH/25 ug/mL CORT did not significantly increase ethanol intake, but it is important to note, all groups consumed similar amounts of fluid throughout the drinking paradigm, reducing confounds in assessing febrile response.

Experiment 2: Poly I:C challenge in adulthood

- 4 mg/kg Poly I:C injected intraperitoneally (i.p.)

#: $p < 0.0001$
&: $p < 0.001$
*: $p < 0.05$,
***: $p < 0.001$
***: $p < 0.0001$



- Male rats with a history of ethanol consumption had a sensitized fever response, while CORT appeared to blunt a response
- All rats, regardless of group, exhibited sickness behavior

Conclusions

- There was no significant enhancement in ethanol consumption due to CORT exposure, but rats with a history of ethanol consumption had a sensitized fever response to Poly I:C.
- Elements of the adolescent experience, such as stress, pubertal maturation, neuro-developmental changes, and social dynamics, may contribute to heightened patterns of alcohol consumption. Particularly, stress during adolescence, paired with binge drinking, may be impacting immune functioning
- Going forward, future research can examine intermittent CORT exposure and explore the role of the HPA axis

References

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