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BRIEF PERINATAL EXPERIENCES WITH ETHANOL INTOXICATION MODIFY RESPIRATORY AND THERMOREGULATORY PLASTICITY AND AFFECT SUBSEQUENT ETHANOL INTAKE PATTERNS IN RATS

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Prior studies indicate that perinatal develop conditioned breathing depression mediated by ethanol’s toxic effects upon the respiratory system. Stimuli paired with the disruptive respiratory effects of the drug later elicit isodirectional effects relative to the ones originally elicited by the state of intoxication. In this study we utilized an animal model that, in terms of brain development, mimics the main characteristics of the 3rd human gestational trimester. Different goals were pursued: a) the analysis of respiratory and thermal consequences of sequential exposure to ethanol (0.0 or 3.0 g/kg, i.e., postnatal days 3, 5 and 7) upon later effects (postnatal day 9) of different ethanol doses (0.0, 0.75, 1.5 or 3.0 g/kg) and b) the consequences of early ethanol sequential ethanol exposure upon infantile alcohol drinking patterns (postnatal days 11 and 12). The results indicated that sequential ethanol exposure leads to a conditioned breathing depression probably regulated by contextual cues. This response was independent from thermal changes at test and was only observable in pups with an initial heightened sensitivity to ethanol’s depressant effects upon respiration. Interestingly, when pups were evaluated in terms of alcohol drinking, there was evidence of a conditioned thermal response (hypothermia) that generated subsequent aversions to ethanol. Overall, the study indicates the existence of multiple learning effects comprising respiratory and thermoregulatory patterns of the developing organism that can also impact upon subsequent ethanol intake patterns.