

Treadmill exercise buffers behavioral alterations related to ethanol binge-drinking in adolescent mice.

Sampedro-Piquero, P.^{1,2*}, Millón, C.^{2,3}, Moreno-Fernández, R.D.^{1,2}, Garcia-Fernandez, M.^{2,3},
Díaz-Cabiale, Z.^{2,3}, Santín, L.J.^{1,2*}

¹ Departamento de Psicobiología y Metodología de las Ciencias del Comportamiento, Facultad de Psicología, Universidad de Málaga, Spain.

² Instituto de Investigación Biomédica de Málaga (IBIMA).

³ Departamento de Fisiología Humana, Facultad de Medicina, Universidad de Málaga, Spain.

* Correspondence: patricia.sampedro@uma.es (P.S.P.); luis@uma.es (L.J.S.)

Abstract The binge-drinking pattern of EtOH consumption, which is frequently observed in adolescents, is known to induce several neurobehavioral alterations, but protection strategies against these impairments remain scarcely explored. Our aim was to study the protective role of treadmill physical exercise on the deficits caused after repeated cycles of binge-like EtOH exposure in the cognition, motivation, exploration, and emotion of C57BL/6J mice from adolescence to adulthood. Animals were divided into four groups: control group, exercised group, EtOH group, and exercised + EtOH group (20% in tap water). The exercise was performed for 20 minutes, 5 days/week at 20 cm/s. Then, animals were submitted to several behavioral tasks. Compared to binge-drinking mice, the exercised + EtOH group exhibited diminished anxiolytic-related behaviors, enhanced exploratory activity, and reduced preference for alcohol odor when another rewarding stimulus was present (social stimulus). Besides, exercised + EtOH group showed a decrease of explorative behavior after repeated exposition to the same context (habituation learning), whereas working memory was not improved. Unfortunately, exercise was not able to reduce alcohol consumption across the weeks. Physical activity during adolescence could buffer certain neurobehavioral alterations associated with binge-drinking, despite not reducing the quantity of consumed alcohol.

Keywords: adolescence; aerobic exercise; alcohol; behavior; drinking in the dark; mice