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Stress-alcohol use disorders interactions in adolescent rat: neuroprotective role of argan oil

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Adolescent intermittent ethanol (AIE) exposure can lead to the development of psychiatric disorders, including alcoholism in adulthood. This work aim to address the following questions: does AIE exposure alter response to subsequent stress challenge? And, does stress experience concurrent with AIE exposure further exacerbate increased drinking? Rats received intermittent ethanol exposure (ip 3g/kg/2jx8) during post-natal days (PND) 30–44, and emotional responses (anxio-depressive like behaviors) were measured after 6 weeks of the last AIE. Our results show that AIE exposed rats exhibited altered response to forced swim (FS) stress (increased immobility time) and open field (OF) stress (decreased locomotor activity). Similar results were obtained in rats exposed for 6 weeks consecutive (PND 44-85), to unpredictable mild chronic stress (UCMS), modeling depression. Also, when AIE is associated with UCMS in a third group of rats, the emotional response is severely impaired. In adulthood, the voluntary consumption of ethanol was measured in the two-bottle choice paradigm (water vs. ethanol 10%). AIE-exposed rats that received UCMS showed a greater increase in ethanol intake (~4.2 g/kg) compared to AIE no-stress rats (~3.1 g/kg) and control stress rats (~2.6 g/kg), after 6 weeks of free ethanol consumption. Collectively, these data indicate a reciprocal interaction between stress and alcoholism, with AIE exposure altered stress responsiveness and UCMS exposure further increasing AIE-induced escalation of drinking. Another question, our study aims to exploded is: does argan oil (AO) dietary affect the behavioral response, biochemical and oxidative profiles of amygdala involved in emotional responses to stress. The variation of these parameters was evaluated in AIE-rats receiving dietary 10 ml/kg/day of AO, starting from weaning, for 9 weeks (PND 21-114). Our results show that supplementation has resulted in an increase in locomotor activity, reduced sensitivity to frightening environments (OF, FS) in UCMS rats. Moreover, oxidative stress markers, and corticosterone show a tendency to be regulated. These results suggest, for the first time, a neuroprotective effect of AO against disorders induced by stress and alcohol use interaction in adolescence.

Biography

El Mostafi Hicham is a PhD student studying the interactions between stress and alcohol use disorders in adolescent rat and neuroprotective role of argan oil, at the Center for Doctoral Studies (4th year), Ibn Tofail University, Kenitra, Morocco. In 2015 he obtained his Master's degree in Human Neurocognition and Population Health. During this training he studied the causal links between school performance and drug use among a population of high school adolescent. Since 2015 he is a member of the Laboratory of Genetic, Neuroendocrinology and Biotechnology, Faculty of Sciences, Ibn Tofail University, Kenitra, Morocco. He has been working on the effect of early life ethanol exposure (*in utero* and/or adolescence) on the vulnerability to develop alcohol dependence, cognitive and emotional disorders in young people. His studies are based on the use of the preclinical model to discover this phenomenon in rodents and explored the neurobiological mechanisms underlying long-term vulnerability to alcohol use disorders.

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