# SOCIAL ISOLATION IN EARLY ADOLESCENCE INDUCES LONG-TERM CHANGES IN DOPAMINERGIC SYSTEM AND INCREASES THE SUSCEPTIBILITY TO FOOD ADDICTION IN ADULTHOOD

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Exposure to early life stress, such as social isolation (SI), is able to prompt changes in sensitive brain circuitries, essentially in the mesolimbic dopaminergic system and increase the risk for psychiatric disorders later in life. SI can stimulate the consumption of rewarding substances, like drugs of abuse and palatable foods. However, most studies analyze long periods of SI and very little is known about the effects of a brief social isolation in a sensitive period of development and its association with palatable foods on the reward system sensitization. Therefore, the aim of this study was to analyze the effects of a short period of SI combined with a chronic access to a high sugar diet (HSD) on sweet food seeking behavior, and possible alterations in dopaminergic parameters and synaptic function in the nucleus accumbens (NAc). We used female Wistar rats that were socially isolated from post-natal days (PND) 21 to 35 and received chronic HSD until PND 60. After five days of washout, on PND 65, the habituation protocol of the sweet food seeking task (using Froot Loop®) was performed. It lasted 5 days under food restriction, and the test session was conducted on the 6$^{th}$ day in a fed state. During the habituations and test sessions we analyzed the latency to take the food, the latency to start eating and the amount consumed. Another subset of animals was killed on PND 65 to determine the dopaminergic parameters in NAc using western blotting. In addition, the excitatory synaptic transmission on NAc neurons was studied in slices using Whole cell - patch clamp. We found that animals SI after weaning increased sweet food seeking ($p$=0.004) as well as the amount of Froot Loop® consumed ($p$=0.025) in a fed state. In the same way, SI animals showed a reduced basal immunocontent of D2R ($p$=0.024) in the NAc. The electrophysiological properties of synaptic transmission are still been analyzed. This study highlights that a short post-weaning social isolation is able to induce long-term changes in the NAc dopaminergic system and increase sweet food seeking. These results emphasize the importance of stressful experiences during a short period of development on reward circuit programming and susceptibility to food addiction later in life.