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Abstract

Introduction

Attention deficit/hyperactivity disorder (ADHD) is a neurodevelopment disorder that affects 5-10% of school-age children. Although ADHD has comorbidity to anxiety, few reports about anxiety behavior are known in an ADHD model, especially in spontaneously hypertensive rat (SHR), while there are many behavioral data about hyperactivity, inattention and impulsivity. We investigate whether anxiety were influenced by environment during the period of development of SHR.

Method

Rats were grown for 5 weeks from P25 in environmental enrichment (EE) or standard environment (SE), followed by open-field test (OFT), cylinder test (CYT), and social interaction test (SIT) with comparison to control animal Wistar-Kyoto rat (WKY). Also the expression of cocaine- and amphetamine-regulated transcript (CART) was investigated in the medial prefrontal cortex (mPFC) and the amygdala (Amy) using realtime-PCR after EE.

Result

In OFT, EE decreased total distance and the velocity of locomotion in both SHR and WKY. However EE failed to decrease the number of entrance into center area in both strains. In CYT, EE increased staying time and also decreased the number of rearing in both SHR and WKY. Also the number of rearing was significantly high in SHR of EE compared to WKY, especially at the first minutes. In SIT, EE increased the number of sniffing in both strains, although sniffing number was higher in SHR compared to WKY. Also CART mRNA was increased by EE in both mPFC and Amy in SHR, but not in WKY.

Conclusion

Data suggest that SHR exhibits more anxious behavior in EE than WKY, which would relate to enhanced expression of CART in PFC and Amy only in SHR.