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"Characterizing Dopaminergic Innervation to the Central Amygdala across Brain Development"

Anxiety disorders are among the most prevalent mental health conditions, affecting nearly one in three adolescents and one in five adults in the United States. Adolescence represents a critical development window, as many anxiety disorders first emerge during this period and continue into adulthood. Despite this, the neurobiological mechanisms underlying age-related vulnerability to anxiety remain unclear. The central amygdala (CeA) is a critical region involved in emotional processing and anxiety regulation. Dopamine (DA) signaling within the CeA plays a key role in modulating these behaviors, yet little is known about how this system changes across development and between sexes. In this study, we investigated developmental differences in dopaminergic markers in the CeA of male and female Wistar rats. We used immunohistochemistry to assess tyrosine hydroxylase (TH, a marker of dopaminergic neurons) fiber density as proxies for DA innervation into the CeA. *In situ* hybridization was used to measure expression of the dopamine receptor *Drd1* and *Drd2*, as well as *Cart* (Cocaine-and amphetamine-regulated transcript, a neuropeptide involved in stress and reward processing). We hypothesized that expression of markers involved in DA signaling would differ between adolescence and adulthood. To test this, we examined tissue from adolescent (postnatal day 30; P30) and adult (P70) rats using immunohistochemistry and *in situ* hybridization. Animals were assigned to one of four groups based on age and sex: adolescent males (postnatal day 30; P30), adolescent females (P30), adult males (P70), and adult females (P70), with n = 3 per group. Our preliminary findings suggest age-dependent differences in dopaminergic innervation and gene expression in the CeA. These results may reflect a developmental reorganization of DA signaling that could contribute to sex- and age-related differences in anxiety-related behaviors.