Puberty increases excitatory synapse markers in the medial amygdala

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Puberty is a phase of mammalian reproductive development marked by dramatic phenotypic plasticity. In addition to physical changes, social behaviors such as courtship, coitus, and territorial aggressiveness emerge at puberty. The neurobiological mechanisms that underlie the development of these behaviors, however, are unclear. In the Siberian hamster, *P. sungorus*, the initiation of puberty is controlled by photoperiod. We used summer- and winter-like photoperiods to induce puberty in one cohort of hamsters and to inhibit puberty in another. All hamsters were perfused at 40 days of age. We then used double label immunofluorescence in conjunction with stereology to estimate several parameters in the posterodorsal subnucleus of the medial amygdala (MePD), an important site for the steroid hormone regulation of social behavior. We report here that post-pubertal male Siberian hamsters have 50% more puncta immunoreactive for vesicular glutamate transporter-2 and postsynaptic density-95, both of which are markers of glutamatergic synapses. There was also a non-significant trend toward 25% more puncta immunoreactive for glutamic acid decarboxylase (GAD). Confirming our previous findings, we observed that post-pubertal hamsters had a larger MePD regional volume as well as larger neuronal somata. Taken together, these data indicate that puberty is accompanied by excitatory synaptogenesis in the medial amygdala, which may contribute to the behavioral changes that occur at this time.