

Adolescent social isolation rearing impaired social behavior and synaptic function in basolateral amygdala in mice

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[Introduction] Early postnatal period is sensitive window for the development of neural circuits and brain functions. Thus, stressful experience in early life increases risks of various psychiatric symptoms including social dysfunction. However, mechanisms how early life stress disrupt the development of social circuits in brain were less understood. In this study, to address this issue, we examined the effects of adolescent social isolation stress on synaptic functions in the basolateral amygdala (BLA), one of the key nodes for regulation of social behavior, in mice. [Methods] Male C57BL6/J mice were isolated during postweaning adolescent period and evaluated emotional behaviors and synaptic functions in BLA by whole-cell patch-clamp method after maturation. [Results and conclusion] Isolated mice significantly decreased social preference and increased impulsive aggression. On the other hand, there were no significant difference in anxiety-like behaviors in the open-field and the elevated plus maze tests between ctrl and isolated mice. Furthermore, isolated mice showed lower AMPA/NMDA current ratio in BLA synapse compared with ctrl mice. These results suggested that social isolation rearing in adolescence disrupted the development of excitatory synaptic function in BLA and impaired social function in mice.