

Repeated restraint stress increases active coping behavior in lactating female mice

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Parental care is necessary for children to grow in mammals. Because pups can obtain their energy only from milk, dams need to care their pups even under stress conditions. Dams may cope with stress in a special manner. In the present study, we examined the neuronal mechanism for stress coping in lactating female mice. The restraint stress (RS) for four hours per day for five consecutive days increased the latency to immobilization and decreased the duration of immobilization in the forced swim test. Repeated RS did not change the immobilization in forced swim test in male mice and virgin female mice. These results indicate that dams increased active coping behavior following repeated RS. We next investigated the noradrenergic neuronal pathway from the locus ceruleus (LC) to the medial prefrontal cortex (mPFC). The analysis using a retrograde neuronal tracer fluorogold indicated that the number of NA neurons activated by forced swim test was less in RS dams than that in control dams. The number of c-Fos-positive cells in the mPFC was also less in RS dams than that in control dams. These results indicate that suppression of NA neuronal pathway from the LC to the mPFC may be involved in increasing active stress coping behavior in dams.