

عنوان مقاله:

Deep brain stimulation in a rat model of post-traumatic stress disorder modifies forebrain neuronal activity and serum corticosterone

محل انتشار:

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خلاصه مقاله:

Objective(s): Post-traumatic stress disorder (PTSD), one of the most devastating kinds of anxiety disorders, is the consequence of a traumatic event followed by intense fear. In rats with contextual fear conditioning (CFC), a model of PTSD caused by CFC (electrical foot shock chamber), deep brain stimulation (DBS) alleviates CFC abnormalities. **Materials and Methods:** Forty Male Wistar rats (220–250 g) were divided into 5 groups ($n=8$) and underwent stereotactic surgery to implant electrodes in the right basolateral nucleus of the amygdala (BLn). After 7 days, some animals received a foot shock, followed by another 7-day treatment schedule (DBS treatment). Next, freezing behavior was measured as a predicted response in the absence of the foot shock (re-exposure time). Blood serum corticosterone levels and amygdala c-Fos protein expression were assessed using Enzyme-linked immunosorbent assay (ELISA) and Western blot, respectively. Furthermore, freezing behaviors by re-exposure time test and general anxiety by elevated plus-maze (EPM) were evaluated. **Results:** PTSD decreased serum corticosterone levels and increased both amygdala c-Fos expression and freezing behaviors. Therefore, DBS treatment significantly ($P<0.001$) enhanced serum corticosterone levels and could significantly ($P<0.001$) reduce both c-Fos protein expression and freezing behaviors' duration. However, DBS treatment has no effect on the general anxiety in PTSD rats. **Conclusion:** We argue that these outcomes might demonstrate the mechanism of DBS treatment, a complete therapeutic strategy, in PTSD patients.

کلمات کلیدی:

Amygdala, Anxiety behavior, Corticosterone, c-Fos, Deep brain stimulation, Freezing behavior, Post-traumatic stress

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