Repeated tactile stimulation promotes hippocampal neurogenesis and reduces depression-like behaviors

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Background

There are studies reported the effectiveness of tactile stimulation on clinical studies. For instance, a human study showed that after receiving a tactile stimulation treatment (Wilbarger's protocol) the subjects showed a decrease in salivary corticosterone level. However, there is a lack of evidence to support the pro-neurogenic role of tactile stimulation. The anxiety level in burnt patients was decreased after massage therapy. Preclinical studies demonstrated that manual stimulation of whisker-pad or facial muscles of rats promoted functional regain and nerve regeneration, which suggests that tactile stimulation could promote neuroplasticity when the potential therapeutic effect of brushing will be determined. After treatment for 2 weeks, animals will be subjected to behavioral tests at day 14 and 15, followed by sacrifice at day 16.

Objective of study

To test whether repeated tactile stimulation increases hippocampal neurogenesis and affect affective behaviors under control and anxiety conditions caused by hypercortisolemia.

Experimental design

Animals are divided into 4 groups (n=8 per group): 1) Control group with daily handling and vehicle injection; 2) cort group with daily high dose corticosterone treatment (40 mg/kg, subcutaneous injection); 3) Brush group with daily tactile stimulation and 4) Brush-cort group with corticosterone treatment and brushing. The duration of treatment will be 14 days. Affective and neurogenesis impairment will be induced by corticosterone treatment and the potential therapeutic effect of brushing will be determined. After treatment for 2 weeks, animals will be subjected to behavioral tests at day 14 and 15, followed by sacrifice at day 16.

Results

Body weight gain and the weight of adrenal gland after treatment.

(A): Brushing significantly increased body weight in co-treatment group compared to cort group. (B): Corticosterone significantly suppressed body weight gain and the growth of adrenal glands in both cort-treated group and co-treated group. Result was performed in means SEM. *: p<0.05, One-way ANOVA with LSD post hoc test.

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