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EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION ON
HYPOTHALAMIC-PITUITARY-ADRENAL AXIS OF PATIENTS WITH DEPRESSION

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Objective: To investigate the effects of sleep electroencephalogram-modulated repetitive transcranial magnetic stimulation (SEM-rTMS) and conventional rTMS (C-rTMS) on the activity of hypothalamic-pituitary-adrenal (HPA) axis in patients with depression.

Methods: In a double-blind, randomized controlled trial, 164 patients diagnosed with depression were randomized to treatment with SEM-rTMS (n=57), C-rTMS (n=55) or sham rTMS (n=52) for 30 min every day for 10 d. Before and after treatment plasma concentrations of adrenocorticotrophic hormone (ACTH) and cortisol (CORT) were measured, and the 24-item Hamilton Depression Rating Scale (HAMD-24) was used for assessment.

Results: The HAMD-24 scores and plasma ACTH and CORT concentrations of these depressive patients before treatment were significantly different from those of the normal control group ($P < 0.05$). The HAMD-24 scores and plasma ACTH and CORT concentrations in the SEM-r TMS group and conventional rTMS group were decreased significantly ($P < 0.05$). There was a significant positive correlation between the HAMD-24 scores and plasma ACTH (n=240, $r=0.105$, $P=0.048$) and CORT concentrations (n=240, $r=0.126$, $P=0.023$) in the patients with depression before and after treatment.

Conclusion: The antidepressant effect of rTMS, including SEM-rTMS, may be related to its decreasing HPA axis activity. (This trial was registered. No: ChiCTR-TRC-00000465).