LONG-TERM CLINICAL AND CORTICAL EFFECTS OF SYSTOLIC EXTINCTION TRAINING IN FIBROMYALGIA

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Background: Different studies report diminished baroreflex sensitivity in fibromyalgia (FM) patients that interferes the signal relay to the nucleus tractus solitaries (NTS) termed as NTS reflex arcs is associated with increased peripheral sympathetic stress responses and central sensitization in a hypertensive subgroup of FM.

The present study examined central components of pain processing before and after systolic extinction training (SET) that combines operant behavioral therapy with baroreceptor training. SET aims at new-programming of the NTS reflex arc in FM.

Methods: 20 FM patients were treated with SET compared to sham therapy (ST) delivered to 32 healthy controls (HC). We evaluated evoked potentials (N50, N150, P260, P390) to electrical stimuli of 3 different intensities during either the systolic or diastolic peak of the cardiac cycle. Clinical pain, pain threshold, and pain tolerance were also assessed pre-, post- and at follow-up treatment.

Design of Systolic Extinction Training - SET
10 two hour Sessions in 5 weeks

Result 1. Patients receiving SET reported a significant reduction in Clinical Pain Intensity post-treatment (all Ps < 0.001).

In contrast to the ST group, 82% of the SET participants showed a 12 months lasting pain relieve and in 18% of the patients a pain reduction to 0.68 (VAS 0 - 10, P < 0.001).

Result 2. Both sensory and pain threshold as well as pain tolerance increased significantly to 69.53% and 61.54% immediately and 6-12 months after SET.

Result 3. The pain reduction was associated with a significant increase in BRS. The remission of Clinical Pain was associated with a significant decrease in Blood Pressure, and an increase in EMG and Physical Activity and Interference measured in MPI as well as a low Catastrophizing (all P's<0.01).

Result 4. The number of deep sleep phases in the 1st half of the night was increased after SET associated with significantly higher sleep efficacy and lower number of arousals (all P<0.01).

Result 5. In FM both early and late evoked potentials were influenced by stimulus intensity (all p’s<0.01) before but not after treatment.

Conclusion: Cardiac gated peripheral afferent stimulation combined with behavioral treatment may induce changes in central pain processing that lead to pain remission in patients with hypertensive stress reactivity. SET activates cognitive and affective brain regions and might create new-program pain inhibitory mechanisms.