

## Neuromuscular Electrical and Thermal-Tactile Stimulation for Dysphagia Caused by Stroke: A Randomized Controlled Trial

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**Objective:** The aim of this study was to assess the effectiveness of neuromuscular electrical stimulation in patients with dysphagia caused by stroke.

**Methods:** Thirty-six subjects were randomized into experimental and control groups. The control group was given thermal-tactile stimulation treatment only, while in the experimental group neuromuscular electrical stimulation and thermal-tactile stimulation treatments were applied simultaneously. Swallowing function was assessed before and 4 weeks after treatment, and evaluated via the swallow function scoring system, penetration-aspiration scale, and pharyngeal transit time. In addition, the discomfort score during the treatments and the satisfaction score 4 weeks after the treatments were measured.

**Results:** Twenty-eight persons with dysphagia completed the study, 16 in the experimental group and 12 in the control group. Both groups showed improvement, but the experimental group showed more significant improvement in the swallow function scoring system, penetration-aspiration scale and pharyngeal transit time than the control group. The patient's discomfort score did not show statistically significant differences in either group, but the satisfactory score was higher in the experimental group.

**Conclusion:** The results suggest that neuromuscular electrical stimulation combined with thermal-tactile stimulation is a better treatment for patients with swallowing disorders after stroke than thermal-tactile stimulation alone.

**Key words:** swallowing, dysphagia, stroke, neuromuscular electrical stimulation.