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Neuromuscular Electrical Stimulation Helps Stroke Patients Regain Ability to Swallow

Individuals who have suffered acute strokes commonly experience dysphagia – difficulty in swallowing – which gives them increased risk for medical complications such as pneumonia, malnutrition and dehydration, and which, in turn, tends to lead to prolonged hospitalizations, re-hospitalizations, the need for institutional care, and overall increased medical care costs.

David S. Kushner, M.D.

Approximately 10% of new stroke patients experience severe to profound dysphagia, which puts them most at risk for those complications. Conventional therapy includes various exercises and maneuvers that target the muscles involved in swallowing and giving them nourishment through a feeding tube.

Now researchers at the University of Miami Miller School of Medicine have achieved superior patient outcomes in severe to profound stroke dysphagia by combining conventional treatments with transcutaneous neuromuscular electrical stimulation (NMES), which involves application of intermittent electrical current through electrodes placed at the face, jaw and neck over the muscles used in swallowing. The researchers' findings were published in an article in the June issue of the *American Journal of Physical Medicine and Rehabilitation*.

"Our study findings showed NMES associated with better discharge swallowing outcomes, with more discharges to home, and with fewer transfers back to acute care hospitals due to a medical complication than with traditional treatment alone," said David S. Kushner, M.D., clinical professor of physical medicine and rehabilitation, and first author and principal investigator of the paper.

The study was conducted with 359 patients undergoing inpatient rehabilitation. Over a period of approximately three weeks, the investigators found that twice as many patients in the electrical stimulation group improved to having minimal or no swallowing restrictions and no longer requiring a feeding tube, compared with the group receiving only traditional treatment.

In addition, they found that three times as many patients in the traditional treatment group had medical complications that resulted in transfers back to an acute care hospital, compared with the patients in the electrical stimulation group, suggesting that the electrical stimulation may have provided a protective effect that helped to prevent some of the medical

complications associated with impaired swallowing.

Moreover, 60% of patients in the electrical stimulation group were discharged home, compared with 44% in the traditional treatment group. This finding, say the authors, is probably because fewer patients in the NMES group required tube-feedings at the time of discharge from the rehab unit.

“The findings in this study add to findings from our previous research work published in 2013,” said Douglas Johnson-Greene, Ph.D., M.P.H., professor of physical medicine and rehabilitation and co-author of the study. “That study was conducted on 92 stroke patients with feeding-tube-dependent swallowing impairment, and it showed NMES to be more effective in improving them to minimal or no swallowing impairments and no longer requiring a feeding tube.”

There were no adverse events in either study, as in other studies using NMES for treatment of impaired swallowing.

“We conducted this study because many people with strokes lose their ability to safely swallow and may need feeding tubes to receive nutrition,” Dr. Kushner said. “Our study shows a safe treatment to speed recovery of safe swallowing after a stroke.”