## ORAL PRESENTATIONS

## OP3

# Effect of Constraint-Induced Movement Therapy Combined with Neuromuscular Electrical Stimulation on Upper Extremity Function in Stroke Survivors: A Systematic Review

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**ABSTRACT**

**Background and Objectives:** Upper extremity (UE) impairment is one of the most common motor disabilities following a stroke. Most stroke survivors have a long-term impairment that restricts daily activities and social participation. Following a stroke, Constraint-Induced Movement Therapy (CIMT) and Neuromuscular Electrical Stimulation (NMES) counteract learned non-use phenomena and enhance motor function and quality of life. This review aimed to identify the impact of combining NMES+CIMT on improving post-stroke UE function. **Methods:** A comprehensive search was conducted in established electronic databases, including PubMed, Scopus, Embase, Medline, and Cochrane Library, by using search terms: 'Constraint-Induced Movement Therapy'; 'Neuromuscular Electrical Stimulation'; 'stroke'; and 'upper extremity' to identify studies that combined CIMT+NMES. Two reviewers conducted article selection, data extraction, and quality assessment independently. Another reviewer was assigned to solve any disagreements. The methodological quality was assessed using the McMaster Critical Appraisal Form, and the results were analyzed using qualitative synthesis. **Results:** Two studies out of 2894 were included following multi-level screening: one case report and one case series study. Despite both studies indicating improvements in most of the outcomes following the intervention, in the case series study, Electromyography-Triggered Neuromuscular Stimulation (ETMS) did not appear to have functional advantages. However, ETMS significantly increased active wrist extension, allowing patients to be eligible for CIMT. After participating in CIMT, patients demonstrated further motor improvements. However, the effectiveness of both therapies combined is still lacking. **Conclusion:** Due to the lack of evidence, further good-quality studies are needed to determine the effects of combining CIMT+NMES.

**Keywords:** Constraint-induced movement therapy; neuromuscular electrical stimulation; stroke; upper extremity.

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