Effects of Non-invasive Brain Stimulation for Upper Limb Rehabilitation in Acute Stroke Patients – A Controlled Clinical Trial

Wong Ka Hei
Physiotherapist I
Tuen Mun Hospital

OBJECTIVES AND METHODOLOGY

- To examine and compare the effects of rTMS and tDCS on enhancing upper limb functional recovery in acute stroke patients.
- Patients diagnosed with Cerebrovascular Accident (CVA) were recruited from the Rehabilitation Stroke Unit of TMH

Inclusion criteria	Exclusion criteria
• Wrist and fingers control of Oxford Scale Grade 2 or above	• Unstable medical conditions • Transient ischemic attack • Contraindications to rTMS / tDCS

TREATMENT GROUPS

rTMS group (n=9)

- Inhibitory stimulation was conducted to Abductor Pollicis Brevis area of the unaffected hemisphere.
- Received 1,200 pulses of 1Hz rTMS at 90%of resting motor threshold.
- 5 consecutive sessions of rTMS together with intensive PT upper limb training were given.

tDCS group (n=11)

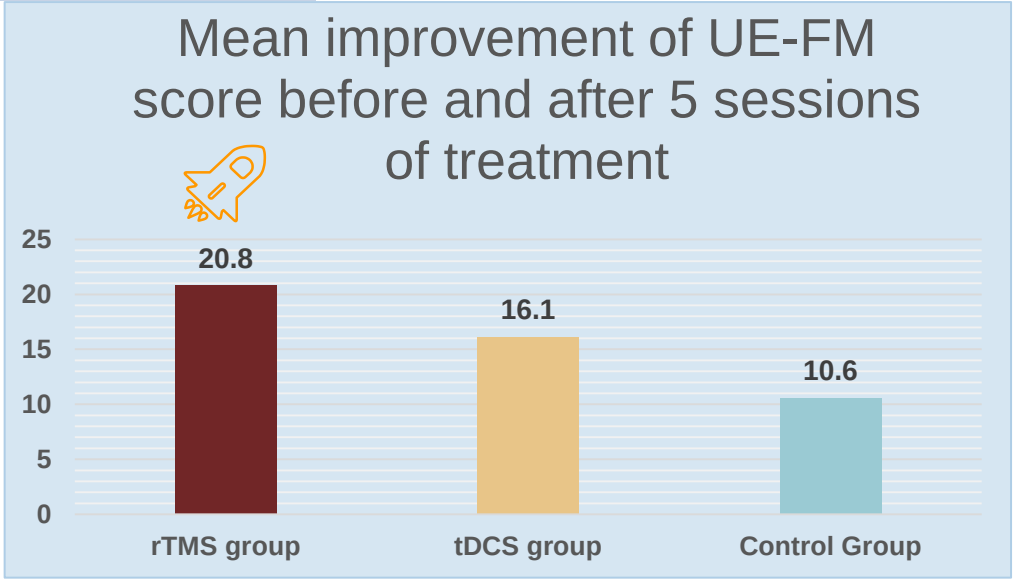
- Anodal (excitatory) stimulation by tDCS was conducted to the hand area of primary motor cortex (M1) of the affected hemisphere through the electrode placed over C3/C4.
- Cathodal electrode was placed over the contralateral supraorbital area.
- Patient received 1mA tDCS for 20 mins.
- 5 consecutive sessions of tDCS together with intensive PT upper limb training were given.

Control group (n=9)

- 5 consecutive sessions of intensive PT upper limb training were given.

RESULTS

- The mean age was 62.7 ± 12.0 years old and the mean time between stroke onset and the first UE-FM assessment was 9.14 ± 3.30 days.
- There was no statistically significant difference in mean age and mean time between stroke onset and the first UE-FM assessment between three groups.



Between group comparison	Results
rTMS group VS Control group	*rTMS has significant effect (p= 0.002)*
tDCS group VS Control group	*tDCS has significant effect (p= 0.02)*
rTMS group VS tDCS group	No significant difference (p=0.152)

Both rTMS and tDCS could enhancing upper limb motor functional recovery

In acute stroke patients!

No adverse effects reported

Positive feedback from patients and doctors!

Warrant further investigation for neuro-rehabilitation

Full of opportunities!