



Service Priorities and Programmes
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Transcranial Magnetic Stimulation Service in Kowloon Hospital

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Introduction

Transcranial magnetic stimulation (TMS) is a non-invasive method to deliver stimuli through the scalp in conscious humans. It is now commonly used in different neuropsychiatric disease, like stroke, depression, Parkinson's disease etc. Single-pulse TMS is used to explore brain functioning. The resulting signal, motor-evoked potential (MEP) can be used to assess the corticospinal tract excitability and integrity. Repetitive TMS (rTMS) is used to induce changes in brain activity that can last beyond the stimulation period. It is hypothesised that the therapeutic action of rTMS may occur through modulating and reversing abnormal activity in cortical and subcortical networks and facilitating neuroplasticity.

Since March 2015, the Department of Rehabilitation in Kowloon Hospital started to provide the TMS service to stroke patients. Currently, we offer low frequency (1Hz) rTMS to those subacute stroke patients for motor rehabilitation. At the same time, we undergo two clinical studies on using TMS in stroke patients. One is using continuous theta-burst stimulation (cTBS) for stroke patient with hemispatial neglect. Another one is using single pulse TMS as the prognostic tool for the upper limb motor recovery in stroke patients.

Objectives

1/ To provide neuro-stimulation to the suitable stroke patients to promote their neurological recovery besides conventional neuro-rehabilitation

2/ To conduct clinical studies to collect the local data before the implementation of the new neuro-stimulations to the suitable stroke patients

Methodology

A retrospective data collections from all the patients who had received the neuro-stimulations for stroke motor rehabilitation.

Result

From March 2015 to December 2017, a total of 53 patients received TMS service, of which 17 patients received rTMS for motor stroke rehabilitation, 15 patients received cTBS in stroke hemispatial study, 18 patients had diagnostic single-pulse TMS for the prognosis of upper limb motor recovery and 3 other cases had rTMS for pain and peripheral stimulation.

In between April 2016 to December 2017, there were 8 patients received low frequency (1Hz) rTMS for upper limb motor stroke rehabilitation. The mean age was 50.5 year-old. The mean Functional test for the Hemiplegic Upper Extremity (FTHUE) improved from 2.5 to 4 after 3 months of rTMS. The mean Fugl Meyer score of upper limb improved from 17 to 22 and the Fugl Meyer score of hand improved from 3.5 to 11.

All the functional range of movement on shoulder, elbow, forearm and wrist were increase 3 months after the rTMS stimulation and upper limb functional training in the Department of Occupational Therapy in Kowloon Hospital.

For the stroke hemispatial neglect study, 15 cases had completed the cTBS treatment and training. The study will be finished after further recruitment of 5 cases in this year and the study result will be available by the end of this year.

The diagnostic single pulse TMS study on subacute ischemic stroke patients has been started since December 2017 and it is expected to be finished in April 2019.

Conclusion:

There was improvement in functional level among subacute stroke patients after receiving low frequency rTMS stimulation and motor rehabilitation as reflected by FTHUE and Fugl Meyer scores of upper limb/hand.

For stroke patients with hemispatial neglect, rTMS may be another potential intervention to improve patient's functional outcome and the result of the clinical study will be available at the end of this year