Service Priorities and Programmes

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Application of Repeated Transcranial magnetic stimulation (rTMS) in stroke- a preliminary study

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Introduction

Upper extremity dysfunction is common in patients suffering from stroke. Novel approaches have involved the use of non-invasive brain stimulation such as Repeated Transcranial Magnetic Stimulation (rTMS) to modulate brain excitability and thus promote recovery. The Physiotherapy Department of Princess Margaret Hospital (PMH) has launched new stroke rehabilitation program for upper extremity integrating rTMS with intensive post-stimulation physiotherapy. This abstract reports the preliminary outcomes of this rehab program.

Objectives

(1). To establish the safety usage of rTMS as a clinical modality in stroke rehab. (2). To evaluate the clinical efficacy of rTMS in treatment of hemiplegic upper extremity dysfunction.

Methodology

Stroke patients discharged from PMH fulfilling the following criteria were screened and invited to take part in the program: Presence of moderate degree of upper extremity dysfunction and CT confirmed lesions at subcortical region within MCA territory. Patients will be absolutely contraindicated if they have previous surgery or implants in the head and neck region or have history of epilepsy. Written consent was obtained after thorough explanation of the risks and benefits of the treatment program. All patients received five consecutive sessions a week for two weeks. Each session included 20 minutes of low frequency rTMS applied to contra-lesional motor cortex (M1) at a predetermined intensity, followed by 30 minutes of intensive physiotherapy neurological interventions for upper extremity. Main outcome measures: Fygl Meyer upper extremity score (UEFM) and Box and Block test (BBT) were used.

Measurements were taken at four intervals during the course of the program: Before intervention, immediately after one, five and ten sessions of treatment. Patients were also examined for presence of any subjective discomfort during or after treatment at each follow-up.

Result

Nine subacute to chronic stroke patients (Mean time from onset 115 days; 4 Females, 5 Males; Mean age: 52) completed the program between April 2014 and Oct 2014. No adverse responses or subjective discomforts were reported. One way repeated measure ANOVA showed significant improvement in UEFM after 5 or 10 days of rTMS and in BBT after 10 days of rTMS ($p < 0.01$). Conclusion: The results of this preliminary study support other published evidence that rTMS is safe to use and is potentially effective adjunct to Physiotherapy for rehabilitation of stroke patients presenting with upper extremity dysfunction.