REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION IN THE TREATMENT OF MAJOR DEPRESSIVE DISORDER

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A. INTRODUCTION

Repetitive transcranial magnetic stimulation (rTMS) is a novel treatment for Major Depressive disorder that has been USA FDA approved since 2008 and is now in routine use internationally. The College of Psychiatrists, Academy of Medicine (Singapore) has endorsed the use of rTMS for depression in Singapore since 2014 [1] along with other major international professional organizations [2-5].

Since the publication of the Singapore position paper on use of rTMS in depression, several international publications have published guidelines for the clinical practice of rTMS. In addition increasing clinical sites in Singapore are developing clinical rTMS services. There is a need to establish local clinical guidelines for rTMS use in the treatment of depression to encourage access of rTMS to local patients while ensuring safe and effective rTMS treatment.

B. SCOPE OF GUIDELINES

The Singapore Position Statement gives broad recommendations for the indications, patient selection and training of rTMS practitioners. This clinical guideline seeks to build on these recommendations in 4 areas:

1. Provide updated guidance on patients whom may benefit from rTMS
2. Detailed guidelines on the delivery of the safe and effective delivery of rTMS treatment in routine clinical practice
3. Guidelines on measurement based care to enhance routine clinical care and inform future development of rTMS services
4. Recommendations for continual training and proficiency of rTMS providers
(1) **Patient populations that may benefit from rTMS treatment [4, 6]**

a. Patients with major depressive disorder who have not received satisfactory improvement from 1 or more antidepressant treatments in the current episode
b. Patients with major depressive disorder who had responded to a prior acute course of rTMS
c. Patients with major depressive disorder who have just benefitted from an acute course of rTMS and may benefit from continuation or maintenance antidepressant treatment
d. Patients with major depressive disorder who are relapsing after initially responding to rTMS treatment
e. Patients with acute suicidality or psychosis are generally not considered suitable for rTMS treatment

(2) **Delivery of the safe and effective delivery of rTMS treatment in routine clinical practice**

a. Resting motor threshold (RMT) determination must be determined for either abductor pollicus brevis or the first dorsal interosseous on the contralateral arm for 50% of applied stimuli via visual observation of muscle twitching or electromyography measurement
b. RMT redetermination should be done whenever there is a significant likelihood of a RMT change (e.g. addition of a tricyclic medication, severe sleep deprivation, alcohol intake)
c. Coil positioning should use a measurement system that takes into account individual variation in skull size (e.g. International system of 10-20 placement of EEG electrodes [7])
d. An rTMS operator who is trained to manage seizures should be always present with the patient and have immediate access to appropriate equipment to manage seizures before the arrival of emergency response teams
e. The treatment location, coil type, coil positioning, intensity of rTMS relative to RMT, pulse frequency, intertrain interval and number of pulses per session should be decided based on the patient profile and current evidence base
f. The rTMS operator must be able to independently make routine adjustments (e.g. adjust the rTMS coil) and have clear guidelines on when to contact the rTMS prescriber
g. The rTMS prescriber must be available during rTMS treatment either in person or via telephone for consultation with the rTMS operator
h. A standard course of daily rTMS should last between 4-6 weeks. In patients who experience partial improvement but not remission, it is reasonable to extend the acute course for 1-2 weeks
(3) Measurement based rTMS care

a. Systematic measure of patient symptoms and adverse effects should be done for all patients and integrated with individual patient care records
b. Measurements of patient symptoms and outcome should be made at baseline, every 1-2 weeks during acute treatment and at the end of acute rTMS treatment. Recommended scales are listed in Annex A.
c. Patient outcomes should be routinely audited for quality improvement purposes

(4) Recommendations for continual training and proficiency of rTMS providers

a. As rTMS is a new and novel treatment, it is recommended that practitioners meet regularly for peer reviewed learning at least every 6 months to promote learning of safe and effective care locally.
b. rTMS prescribers who have not prescribed or administered rTMS for more than 1 year are recommended to retrain in rTMS as described in the Singapore position paper [1]

Annexes

A: Recommended rating scales for rTMS assessment
Recommended Rating Scales for rTMS assessment

1. **Symptom ratings**
   a. Montgomery Asberg Depression Rating Scale (MADRS)
   b. Hamilton Depression Rating Scale (HAMD)
   c. Quick Inventory of Depressive Symptoms (QIDS-16)
   d. Patient Health Questionnaire 9 (PHQ-9)
   e. SRS-D

2. **Cognitive ratings**
   a. Montreal Cognitive Assessment (MoCA)

3. **Quality of life ratings**
   a. EQ-5D-3L
   b. Quality of Life Enjoyment and Satisfaction Questionnaire – Short Form (Q-LES-QS)
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