

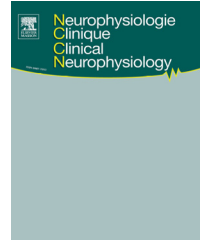


Disponible en ligne sur

ScienceDirect
www.sciencedirect.com

Elsevier Masson France

EM|consulte
www.em-consulte.com/en



ORIGINAL ARTICLE/ARTICLE ORIGINAL

Large-field repetitive transcranial magnetic stimulation with circular coil in the treatment of functional neurological symptoms



Stimulation magnétique transcrânienne répétitive à large champ avec bobine circulaire dans le traitement des symptômes neurologiques fonctionnels

D. Parain*, N. Chastan

Physiology Department, Rouen University Hospital, 1, rue de Germont, 76031 Rouen cedex, France

Received 8 September 2013; accepted 27 April 2014
Available online 15 May 2014

KEYWORDS

Psychogenic disorders;
Conversif disorders;
Functional neurological symptoms;
rTMS;
Functional weakness;
Functional visual loss;
Non-epileptic seizures

Summary

Objective. – Patients with functional neurological symptoms (FNS) are frequently encountered by neurologists and are difficult to treat. Symptoms are multiple and may appear concurrently or successively in the same patient. To date, few studies have been published on focal repetitive transcranial magnetic stimulation (rTMS) in FNS. This type of stimulation induces a focal current, vertically in the cortex. Results are contradictory, probably because it is difficult to identify a limited cortical area that triggers these symptoms. We assessed the efficacy of another type of rTMS: large-field stimulation by means of a circular coil covering a surface area approximately 20 times greater and inducing a circular current tangentially to the cortex.

Published studies. – We analysed two studies on the efficacy of large-field rTMS in functional paralysis and in functional movement disorders. The efficacy of large-field rTMS was very marked in these two studies.

Personal non-published studies. – We reported several open series, including patients with functional sensory loss, functional visual loss, and non-epileptic seizures.

Method. – For all patients, one or several sessions of 60 stimuli with circular coil were carried out with a protocol depending on the symptoms.

Results. – The efficacy of large-field rTMS was dramatic in all patient series. Additionally, we discuss the possible involved mechanism: placebo effect, cognitive behavioural effect or neuromodulatory effect.

* Corresponding author. Tel.: +33 2 32 88 80 37; fax: +33 2 32 88 83 93.
E-mail address: dominique.parain@chu-rouen.fr (D. Parain).

MOTS CLÉS

Troubles psychogènes ;
 Troubles conversifs ;
 Symptômes neurologiques fonctionnels ;
 rTMS ;
 Paralysies fonctionnelles ;
 Troubles visuels fonctionnels ;
 Crises non épileptiques

Conclusion. – According to the data from these different studies, large-field rTMS could be a new therapy for patients with FNS. However, controlled studies are mandatory.

© 2014 Published by Elsevier Masson SAS.

Résumé

Objectif. – Les symptômes neurologiques fonctionnels (SNF) sont fréquemment rencontrés en pratique neurologique et difficile à traiter. Les symptômes sont multiples et peuvent être associés ou se succéder chez un même patient. Peu d'études ont analysé l'efficacité de la stimulation magnétique transcrânienne répétitive (rTMS) focale dans les SNF. Cette stimulation induit un courant très focal, vertical par rapport au cortex. Les résultats sont contradictoires, probablement parce qu'il est difficile d'identifier une cible corticale limitée qui pourrait être l'origine des ces troubles. Nous avons voulu évaluer l'efficacité d'un autre type de rTMS, la stimulation à large champ à l'aide d'une bobine circulaire qui permet de stimuler une surface de cortex environ 20 fois supérieure et qui induit un courant circulaire tangentiel au cortex.

Études déjà publiées. – Nous avons rapporté et analysé deux études concernant l'effet de la rTMS à large champ dans les paralysies fonctionnelles et dans les mouvements anormaux fonctionnels. Dans ces deux études, l'efficacité a été très importante.

Études personnelles non publiées. – Nous rapportons plusieurs séries en ouvert concernant des patients avec des déficits sensitifs fonctionnels, des déficits visuels fonctionnels ou des crises non épileptiques.

Méthode. – Une ou plusieurs sessions de 60 stimulations sont effectuées avec un protocole différent selon les symptômes.

Résultats. – L'efficacité s'est montrée importante dans tous les SNF étudiés. Les hypothèses sur les mécanismes sous-jacents sont discutées: effet placebo; effet cognitivo-comportemental ou effet de neuromodulation.

Conclusion. – La rTMS à large champ pourrait être un nouveau type de traitement pour les patients avec des SNF. Cependant, des études contrôlées sont nécessaires.

© 2014 Publié par Elsevier Masson SAS.

Introduction

Patients with psychogenic or conversion neurological disorders, now called functional neurological symptoms (FNS), are described as the most difficult to treat. FNS are one of the most common conditions encountered by neurologists [4]. Patients with FNS may present with different symptoms, such as paralysis, primary pain, movement disorders, sensory disturbance or visual loss, and non-epileptic seizures. Patients may have one or several symptoms at the same time or in succession.

For more than a decade, numerous studies have been published describing the therapeutic effect of repetitive transcranial magnetic stimulation (rTMS), with depression and neuropathic pain as the main indications. The effect of rTMS has also been studied in epilepsy, movement disorders, tinnitus, auditory hallucinations and stroke, but to a lesser degree. In all these studies, an 8-shaped coil was used to stimulate vertically a 1 to 2-cm² surface of cortex area with the possibility of modifying the activity of deeper structures (focal rTMS). In this type of rTMS, the location of area to stimulate needs to be well defined. Neuronavigation is mandatory for efficient stimulation of this previously defined area [15].

In a recent review [20], data were reported on the efficiency of rTMS in FNS. Only eight studies have been published in the world literature and only 126 patients were included. The indications were functional weakness or movement disorders. For the first time, the use of large-field

rTMS with circular coil is reported in 2 studies from our team and 76 patients have been reported with dramatic results. The circular coil induces a significant magnetic field over a surface approximately 30 times greater than the 8-shaped coil [10] and this magnetic field triggers a tangential-to-the-cortex circular current over the same surface. The rationale for using this type of rTMS is that FNS are probably not triggered by a very restricted cortical area dysfunction but by larger networks or cortical area dysfunction [31]. In other studies [20], focal rTMS was used in FNS with contradictory results.

In this article, we first detail the results of several published studies on the efficacy of large-field rTMS in patients with different motor functional symptoms. Secondly, we present the results of other personal non-published studies in patients with non-motor functional symptoms (sensory disturbances, visual loss, non-epileptic seizures). A multi-centre controlled study is ongoing, coordinated by one of the authors (NC), with ethical committee agreement, on functional weakness (n°RCB: 2010-A006660-39). Focal rTMS is considered safe [16]. Safety of large-field rTMS has not been extensively analysed, but it is routinely used for motor-evoked potential (however, in this case, the pulse is usually single). In a published study on large-field rTMS in the prophylactic treatment of migraine [28], the authors carried out sessions of 1000 stimulations per day during 5 consecutive days without significant adverse effects (about 40 times greater than in our protocols with a maximum of 120 stimulations per week).

Download English Version:

<https://daneshyari.com/en/article/3082244>

Download Persian Version:

<https://daneshyari.com/article/3082244>

[Daneshyari.com](https://daneshyari.com)