BENDIX
Holding Technology

BENDIX BRASIL
Holding Technology

РЕЗЮМЕ ПРОЕКТА BENDIX HOLDING TECHNOLOGY BRASIL

Проект состоит из лечения с помощью нейромодуляции с помощью наших методов **TMS** и **TDCS** различных патологий, при которых может применяться это лечение.

Специальности, где этот вид лечения приносит пользу пациентам, — это психиатрия с **депрессией и тревогой, посттравматическим стрессовым синдромом, мигренью, болезнью Паркинсона, рассеянным склерозом, инсультом, моторной афазией, поведенческими изменениями, болями с центральной точки зрения, дегенеративными неврологическими заболеваниями (болезнь Альцгеймера и деменция), это Основные патологии**.

Каждое заболевание имеет разные сеансы лечения и варьируется в зависимости от пациента и его потребностей, при этом минимальное количество сеансов составляет 5, а максимальное будет варьироваться в зависимости от пациента и эволюции, что определит врача, сопровождающего пациента.

Лечение, как правило, ежегодное, хотя хронический пациент существует и приносит прибыль по мере увеличения количества сеансов.

Цены на лечение будут определяться каждой страной, поскольку каждый рынок отличается. Цены различаются в зависимости от того, что уплачивается в США. по сравнению с другими странами, такими как Испания, со страховыми компаниями или штатами, определяющими цену.

Если взять за основу США, то каждый сеанс стоит 500 долларов, а лечение может превышать 24 000 долларов. Эта модель, например, неприемлема ни в Испании, ни в Бразилии.

В пределах цены также будут зависеть от центров, так как лечение может иметь разные цены в зависимости от организации, где будет применяться лечение.

С другой стороны, у нас есть рынок здоровых людей, которые хотят улучшить умственную работоспособность, этот рынок регулируется по-другому, с более дешевыми методами лечения, цены на лечение которых варьируются от 3 тысяч до 6 тысяч реалов (от 5 до 10 сеансов), так что цены корректируются в зависимости от типа применяемой терапии. Этот рынок очень хорош или должен быть изучен, потому что он генерирует здоровых хронических пациентов, которые потребляют преимущества улучшений каждый год, это означает более высокую маржу или прибыль.

Каждый из методов имеет разное применение. В сложных приложениях используются TMS и, в простейших случаях, **TDCS.**

У здорового человека применяется техника **TDCS**, а у больных людей в зависимости от патологии мы обычно используем технику **TMS** больше или обе в зависимости от фазы, в которой находится пациент, поэтому общее правило не может быть дано, но основано на эволюции, представленной пациентом Определимся с техникой, которая будет реализована.

Dr. Keyhani
Director medico Bendix Holding Technology

OXFORD

International Journal of Neuropsychopharmacology (2021) 24(4): 25

doi:10.1093/ijnp/pyaa051
Advance Access Publication: July 26, 2020
Review

REVIEW

Evidence-Based Guidelines and Secondary Meta-Analysis for the Use of Transcranial Direct Current Stimulation in Neurological and Psychiatric Disorders

Felipe Fregni, Mirret M. El-Hagrassy, Kevin Pacheco-Barrios, Sandra Carvalho, Jorge Leite, Marcel Simis, Jerome Brunelin, Ester Miyuki Nakamura-Palacios, Paola Marangolo, Ganesan Venkatasubramanian, Daniel San-Juan, Wolnei Caumo, Marom Bikson, André R. Brunoni, Neuromodulation Center Working Group[#]

Clinical Neurophysiology 131 (2020) 474–528

Contents lists available at ScienceDirect

Clinical Neurophysiology

journal homepage: www.elsevier.com/locate/clinph

Evidence-based guidelines on the therapeutic use of repetitive transcranial magnetic stimulation (rTMS): An update (2014–2018)

Jean-Pascal Lefaucheur[a,b,*], André Aleman[c], Chris Baeken[d,e,f], David H. Benninger[g], Jérôme Brunelin[h], Vincenzo Di Lazzaro[i], Saša R. Filipović[j], Christian Grefkes[k,l], Alkomiet Hasan[m], Friedhelm C. Hummel[n,o,p], Satu K. Jääskeläinen[q], Berthold Langguth[r], Letizia Leocani[s], Alain Londero[t], Raffaele Nardone[u,v,w], Jean-Paul Nguyen[x,y], Thomas Nyffeler[z,aa,ab], Albino J. Oliveira-Maia[ac,ad,ae], Antonio Oliviero[af], Frank Padberg[m], Ulrich Palm[m,ag], Walter Paulus[ah], Emmanuel Poulet[h,ai], Angelo Quartarone[aj], Fady Rachid[ak], Irena Rektorová[al,am], Simone Rossi[an], Hanna Sahlsten[ao], Martin Schecklmann[r], David Szekely[ap], Ulf Ziemann[aq]

BENDIX
Holding Technology

BENDIX BRASIL
Holding Technology

frontiers | Frontiers in Psychiatry

ORIGINAL RESEARCH
published: 22 June 2022
doi: 10.3389/fpsyt.2022.814611

Check for updates

rTMS Therapy Reduces Hypofrontality in Patients With Depression as Measured by fNIRS

4.- Ademas de estos casos , te fuimos pasando muchas publicaciones que tienes en los mensajes que puedes usar , y ademas te paso estos:

https://www.nature.com/articles/d41586-023-01727-1

https://singularityhub.com/2023/06/05/gently-jolting-the-brain-with-electrical-currents-could-boost-cognitive-function/

https://totaltdcs.com/

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5846193/

https://jcsm.aasm.org/doi/full/10.5664/jcsm.9404

https://pubmed.ncbi.nlm.nih.gov/32179428/

https://www.brainstimjrnl.com/article/S1935-861X(18)31263-4/fulltext

https://www.va.gov/montana-health-care/news-releases/montana-va-to-unveil-vas-first-mobile-medical-unit-to-treat-veterans-with-depression/

JAMA Network Open

Original Investigation | Neurology

High-definition Cathodal Direct Current Stimulation for Treatment of Acute Ischemic Stroke
A Randomized Clinical Trial

Mersedeh Bahr-Hosseini, MD; Kambiz Nael, MD; Gozde Unal, PhD; Marco Iacoboni, MD, PhD; David S. Liebeskind, MD; Marom Bikson, PhD; Jeffrey L. Saver, MD; for the TESSERACT Trial Group

Abstract

IMPORTANCE Cathodal transcranial direct current stimulation (C-tDCS) provides neuroprotection in preclinical models of acute ischemic stroke (AIS) by inhibiting peri-infarct excitotoxic effects and enhancing collateral perfusion due to its vasodilatory properties.

OBJECTIVE To report the first-in-human pilot study using individualized high-definition (HD) C-tDCS as a treatment of AIS.

DESIGN, SETTING, AND PARTICIPANTS This randomized clinical trial was sham controlled with 3 + 3 dose escalation design, and was conducted at a single center from October 2018 to July 2021. Eligible participants were treated for AIS within 24 hours from onset, had imaging evidence of cortical ischemia with salvageable penumbra, and were ineligible for reperfusion therapies. HD C-tDCS electrode montage was selected for each patient to deliver the electric current to the ischemic region only. Patients were followed for 90 days.

MAIN OUTCOMES AND MEASURES Primary outcomes were feasibility, assessed as time from randomization to study stimulation initiation; tolerability, assessed by rate of patients completing the full study stimulation period; and safety, assessed by rates of symptomatic intracranial hemorrhage at 24 hours. The efficacy imaging biomarkers of neuroprotection and collateral enhancement were explored.

RESULTS A total of 10 patients with AIS were enrolled, 7 were randomized to active treatment and 3 to sham. Patient age was mean (SD) 75 (10) years old, 6 (60%) were female, and National Institutes of Health Stroke Scale score was mean (SD) 8 (7). Two doses of HD C-tDCS (1 milliamp [mA] for 20 minutes and 2 mA for 20 minutes) were studied. The speed of HD C-tDCS implementation was a median (IQR) 12.5 minutes (9-15 minutes) in the last 4 patients. Patients tolerated the HD C-tDCS with no permanent stimulation cessation. The hypoperfused region was reduced by a median (IQR) 100% (46% to 100%) in the active group vs increased by 325% (112% to 412%) in sham. Change in quantitative relative cerebral blood volume early poststimulation was a median (IQR) 64% (40% to 110%) in active vs −4% (−7% to 1%) sham patients and followed a dose-response pattern. Penumbral salvage in the active C-tDCS group was median (IQR) 66% (29% to 80.5%) vs 0% (IQR 0% to 0%) in sham.

CONCLUSION AND RELEVANCE In this randomized, first-in-human clinical trial, HD C-tDCS was started efficiently and well tolerated in emergency settings, with signals of beneficial effect upon penumbral salvage. These results support advancing HD C-tDCS to larger trials.

(continued)

Key Points

Question Is application of high-definition cathodal transcranial direct current stimulation (HD C-tDCS) as a noninvasive targeted acute ischemic stroke treatment strategy feasible and well-tolerated, and does it show signals of beneficial effects?

Findings In this randomized clinical trial enrolling 10 patients (7 active, 3 sham), HD C-tDCS was started within a median 12.5 minutes of randomization in final enrolled patients and showed good tolerability with signals of favorable effects on salvage of threatened tissue.

Meaning These results suggest that HD C-tDCS is a noninvasive targeted acute ischemic stroke treatment strategy that can be efficiently applied in emergency settings and warrants testing in larger multicenter trials.

+ Supplemental content

Author affiliations and article information are listed at the end of this article.

ORIGINAL RESEARCH ARTICLE

Effectiveness of High-Frequency Repetitive Transcranial Magnetic Stimulation in Migraine

A Systematic Review and Meta-analysis

Mikhail Saltychev, MD, PhD, and Juhani Juhola, MD

Objective: The aim of the study was to evaluate the effectiveness of repetitive transcranial magnetic stimulation in migraine measured by decrease in pain severity or attack frequency.

Methods: A search at the Cochrane Controlled Trials Register (CENTRAL), MEDLINE (via PubMed), Embase, CINAHL, Web of Science, and Scopus. The risk of systematic bias was rated by using the Cochrane domain-based quality assessment tool. A random-effects model was used.

Results: Of 434 identified records, 8 randomized control studies were included in the meta-synthesis. All have used a high-frequency repetitive transcranial magnetic stimulation targeting the left dorsolateral prefrontal cortex. The risk of systematic bias was low. The difference between repetitive transcranial magnetic stimulation and control groups in frequency of migraine days per month was 8.1 (95% confidence interval = 4.8–11.4) days in favor of repetitive transcranial magnetic stimulation. Respectively, for intensity of migraine pain (scaled from 0 to 100), this difference was 13.6 (95% confidence interval = 5.3–21.8) points in favor of repetitive transcranial magnetic stimulation. The heterogeneity was substantial with $I^2 = 86\%$.

Conclusions: In chronic migraine, repetitive transcranial magnetic stimulation seems to have positive effects on both migraine pain severity and attack frequency compared with sham stimulation. Although the effect on pain intensity was probably clinically insignificant, repetitive transcranial magnetic stimulation reduced pain frequency by 8 days per month on average.

Key Words: Migraine, Chronic Pain, TMS, Systematic Review, Meta-analysis

(*Am J Phys Med Rehabil* 2022;101:1001–1006)

What Is Known

- Although more than 30 reviews on the effect of repetitive transcranial magnetic stimulation (rTMS) in migraine have been published, there has been uncertainty regarding the size of that effect.

What Is New

- This meta-analysis of eight randomized control studies found that positive effects of rTMS seems on both pain severity and attack frequency in chronic migraine compared with sham stimulation. Although the effect on pain intensity was probably clinically insignificant, rTMS reduced pain frequency by 8 days per month on average.

Transcranial magnetic stimulation (TMS) noninvasively generates a magnetic field stimulating the brain cortex by producing brief magnetic pulses. These pulses may affect cortical excitability locally and produce transsynaptic effects distantly. First presented in 1985, the TMS has widely been used for diverse clinical conditions.[1] Repeatedly applying, the TMS pulses is termed repetitive TMS (rTMS). It is believed that the rTMS may affect the activity of cortical and subcortical brain structures related to pain modulation and processing. It may also reduce chronic pain by inhibiting neural pathways at a spinal level.[2] Although the TMS is still especially popular in treatment of psychiatric disorders, there have been growing interest in the TMS effects on neurologic conditions and pain syndromes like neuropathic pain, fibromyalgia, and complex regional pain syndrome.[2–9] The rTMS has been considered a safe method by all previous reviews.

For the past three decades, TMS has been used as an adjuvant therapy of migraine in situations when medication achieves only suboptimal effect.[10,11] By applying rapidly varied magnetic field, rTMS induces weak electric field in the brain tissue. Although the exact mechanism of rTMS in migraine has been debated, the interest toward this treatment method has been substantial. During the last two decades, more than 30 reviews on the topic have been published.[10,12–22]

Although previous reviews have usually concluded that rTMS is effective in treating migraine, there has been uncertainty regarding the size of that effect in migraine prophylaxis and attacks' alleviation. A single meta-analysis conducted on the subject has concluded that rTMS might be efficient to treat migraine attack but inefficient to deal with chronic migraine.[18] That meta-analysis has been limited to five trials. The effects of rTMS have been marginally significant for migraine with aura—odds ratio of 2.3 (95% CI = 1.2–4.5) and insignificant for chronic migraine—odds ratio of 2.9 (95% CI = 0.7–12.2). In that study, one of the included trials, responsible for the biggest analytical weight of 37%, had used a single-pulse TMS instead of rTMS,[23] which left the results and conclusions dubious.

From the Department of Physical and Rehabilitation Medicine, Turku University Hospital, University of Turku, Turku, Finland.
All correspondence should be addressed to: Mikhail Saltychev, MD, PhD, Department of Physical and Rehabilitation Medicine, Turku University Hospital, PO Box 52, FI-20521, Turku, Finland.
Registration (PROSPERO): CRD42021247179.
Financial disclosure statements have been obtained, and no conflicts of interest have been reported by the authors or by any individuals in control of the content of this article.
Supplemental digital content is available for this article. Direct URL citations appear in the printed text and are provided in the HTML and PDF versions of this article on the journal's Web site (www.ajpmr.com).

ISSN: 0894-9115
DOI: 10.1097/PHM.0000000000001953

Moscatelli *et al. BMC Neuroscience* (2023) 24:30
https://doi.org/10.1186/s12868-023-00796-2

BMC Neuroscience

RESEARCH Open Access

High frequencies (HF) repetitive transcranial magnetic stimulation (rTMS) increase motor coordination performances in volleyball players

Fiorenzo Moscatelli[1†], Giusi Antonia Toto[2†], Anna Valenzano[1], Giuseppe Cibelli[1], Vincenzo Monda[3], Pierpaolo Limone[4], Nicola Mancini[5], Antonietta Messina[6], Gabriella Marsala[7], Giovanni Messina[1*] and Rita Polito[1*]

Abstract

Introduction It is widely demonstrated that high frequency (HF) repetitive transcranial magnetic stimulation (rTMS) has facilitative effects and is therefore capable to inducing changes in motor responses. One of the most investigated areas is the dorsolateral prefrontal cortex (DLPFC) as it plays a special executive attention role in actively preserving access to stimulus representations and objectives in environments with plenty of distraction such as those of team sports. Volleyball is a team sport in which the attention and coordination components are essential for achieving performance. Thus, the aim of this study was to investigate if HF rTMS at DLPFC in volleyball players can improve homolateral motor coordination and cortical excitability.

Results This study was a double-blinded (participant and evaluator) matched-pair experimental design. Twenty right-handed female volleyball players were recruited for the study and were randomly assigned either the active rTMS (n = 10) or the sham stimulation group (n = 10). The stimulation was performed in one session with 10 Hz, 80% of the resting motor threshold (RMT) of the right first dorsal interosseous muscle, 5 s of stimulation, and 15 s of rest, for a total of 1500 pulses. Before and after stimulation, the coordination and the cortical excitability were evaluated. The significant finding of this paper was that HF-rTMS of the DLPFC improved performance in terms of the homolateral interlimb coordination, with a significantly decreased in resting motor threshold and MEP latency of the ipsilateral motor cortex. It seem that HF-rTMS could increase coordination performances when the velocity of the execution is higher (120 bpm and 180 bpm).

Conclusion Moreover, in active rTMS group significant differences emerged after stimulation in RMT and in MEP latency, while no differences emerged after stimulation in MEP amplitude. In conclusion we believe that these results may be of great interest to the scientific community and may also have practical implications in the future.

Keywords Transcranial magnetic stimulation (TMS), Repetitive transcranial magnetic stimulation (rTMS), Dorsolateral prefrontal cortex (DLPFC), Interlimb motor coordination, Motor coordination, Cortical excitability, Athletes, Volleyball, Physical activity

†Fiorenzo Moscatelli and Giusi Antonia Toto contribute equally to this work

*Correspondence:
Giovanni Messina
giovanni.messina@unifg.it
Rita Polito
rita.polito@unifg.it
Full list of author information is available at the end of the article

https://doi.org/10.1093/brain/awac285 BRAIN 2022: 145; 3776–3786 | 3776

BRAIN
CLINICAL TRIAL

Precuneus magnetic stimulation for Alzheimer's disease: a randomized, sham-controlled trial

Giacomo Koch,[1,2] Elias Paolo Casula,[1] Sonia Bonnì,[1] Ilaria Borghi,[1] Martina Assogna,[1,3] Marilena Minei,[1] Maria Concetta Pellicciari,[1] Caterina Motta,[1] Alessia D'Acunto,[1] Francesco Porrazzini,[1] Michele Maiella,[1] Clarissa Ferrari,[4] Carlo Caltagirone,[1] Emiliano Santarnecchi,[5] Marco Bozzali[6,7] and Alessandro Martorana[1,3]

See Moussavi (https://doi.org/10.1093/brain/awac322) for a scientific commentary on this article.

Repetitive transcranial magnetic stimulation (rTMS) is emerging as a non-invasive therapeutic strategy in the battle against Alzheimer's disease. Alzheimer's disease patients primarily show alterations of the default mode network for which the precuneus is a key node. Here, we hypothesized that targeting the precuneus with TMS represents a promising strategy to slow down cognitive and functional decline in Alzheimer's disease patients.

We performed a randomized, double-blind, sham-controlled, phase 2, 24-week trial to determine the safety and efficacy of precuneus stimulation in patients with mild-to-moderate Alzheimer's disease. Fifty Alzheimer's disease patients were randomly assigned in a 1:1 ratio to either receive precuneus or sham rTMS (mean age 73.7 years; 52% female). The trial included a 24-week treatment, with a 2-week intensive course in which rTMS (or sham) was applied daily five times per week, followed by a 22-week maintenance phase in which stimulation was applied once weekly. The Clinical Dementia Rating Scale–Sum of Boxes was selected as the primary outcome measure, in which post-treatment scores were compared to baseline. Secondary outcomes included score changes in the Alzheimer's Disease Assessment Scale–Cognitive Subscale, Mini-Mental State Examination and Alzheimer's Disease Cooperative Study–Activities of Daily Living scale. Moreover, single-pulse TMS in combination with EEG was used to assess neurophysiological changes in precuneus cortical excitability and oscillatory activity.

Our findings show that patients that received precuneus repetitive magnetic stimulation presented a stable performance of the Clinical Dementia Rating Scale–Sum of Boxes score, whereas patients treated with sham showed a worsening of their score. Compared with the sham stimulation, patients in the precuneus stimulation group also showed also significantly better performances for the secondary outcome measures, including the Alzheimer's Disease Assessment Scale–Cognitive Subscale, Mini-Mental State Examination and Alzheimer's Disease Cooperative Study–Activities of Daily Living scale. Neurophysiological results showed that precuneus cortical excitability remained unchanged after 24 weeks in the precuneus stimulation group, whereas it was significantly reduced in the sham group. Finally, we found an enhancement of local gamma oscillations in the group treated with precuneus stimulation but not in patients treated with sham.

We conclude that 24 weeks of precuneus rTMS may slow down cognitive and functional decline in Alzheimer's disease. Repetitive TMS targeting the default mode network could represent a novel therapeutic approach in Alzheimer's disease patients.

Received March 27, 2022. Revised June 27, 2022. Accepted July 03, 2022. Advance access publication October 25, 2022