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Sara Barbosa[1]*, Lucas Marques[1],
International Symposium of Neuromodulation Scientific Team[2]

[1] Instituto de Medicina Física e Reabilitação, Hospital das Clínicas HCFMUSP, Faculdade de Medicina, Universidade de São Paulo, São Paulo, SP, Brasil; [2] Instituto SCALA, Sao Paulo, Brazil.

EFFECTS OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) IN PATIENT WITH COMPLEX VISUAL HALLUCINATIONS AFTER ISCHEMIC STROKE IN OCCIPITAL LOBE: A CASE REPORT

Vitor Sossai Bozzi[1], *Letícia Martins Gonçalves[1], Francisco Mateus Vieira[1], Débora Cavalini Gabriel[1], Patrício Alves de Souza[1], Dâmaris Manfro Pinto Garcia[1], Maria Cecília Rodrigues Henckel[1], Isabela Martins Lamas[1], Paola Amaral Amarilho Freitas[1], Bárbara Caetano Piuco[1], Ana Carolina Storch Klein[1], Júlia Menegatti Urban[1], Júlia Gabriela Storch Klein[1], Camila Samrsla Moller[1], Thaizi Andreoli de Paris[1], Weslen de Moura Moraes[1], Andressa de Souza[1], Jairo Alberto Dussán-Sarria[1]*
[1]Inerva Institute (Advanced Neuromodulation and Rehabilitation) and Feevale University. Novo Hamburgo, RS, Brazil.

Objective: This study aimed to report the effects of repetitive transcranial magnetic stimulation (rTMS) in a patient with complex visual hallucinations after an ischemic stroke in the occipital lobe. It's a complex and rare case.
Methods: Male, 66 years old, hypertensive, diabetic, dyslipidemic, ischemic heart disease, and history of bilateral retinal detachment. Initiated visual alteration after stroke in the occipital lobe, in the right posterior cerebral artery area. The symptoms were reduced visual acuity associated with hallucinations plus projected and delayed images, which passed through the visual fields bilaterally in cylinder forms. No other neurological findings. Ophthalmologic appointments ruled out any corresponding cause for the origin of the hallucinations. Based on the literature of a similar case report, the treatment objective was visual rehabilitation for occipital stroke sequelae. 15 sessions were applied on consecutive working days of rTMS, 30 minutes each, with Neurosoft equipment, NEURO-MS/D, double cone bobbin, with an inhibitory stimulus of 1Hz, O1 region (EEG System 10-20) contralateral to the lesion, 1800 pulses, relative amplitude 110%.
Results: During the 6th session, the patient reported the absence of hallucinations; 10th session, the patient complained of reduced visual brightness. Hallucinations remained absent after 15 sessions and 30 days after the last session.
Conclusion: A presence of visual hallucinations is associated with cortical hyperactivity of the contralateral occipital lobe after some damage, causing an interhemispheric unbalance. Therefore, rTMS can be used because it doesn't offer risks or adverse effects, acting by redistributing previously unbalanced cortical activity at the stimulation site and modulating hallucinatory symptoms.

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REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) AS A NON-DRUG METHOD OF TREATMENT IN A PREGNANT WOMAN WITH IDIOPATHIC NEUROPATHIC PAIN: A CASE REPORT

Vitor Sossai Bozzi[1], *Débora Cavalini Gabriel[1], Letícia Martins Gonçalves[1], Francisco Mateus Vieira[1], Patrício Alves de Souza[1], Dâmaris Manfro Pinto Garcia[1], Maria Cecília Rodrigues Henckel[1], Isabela Martins Lamas[1], Paola Amaral Amarilho Freitas[1], Bárbara Caetano Piuco[1], Ana Carolina Storch Klein[1], Júlia Menegatti Urban[1], Júlia Gabriela Storch Klein[1], Camila Samrsla Moller[1], Thaizi Andreoli de Paris[1], Weslen de Moura Moraes[1], Andressa de Souza[1], and Jairo Alberto Dussán-Sarria[1]*
[1]Inerva Institute (Advanced Neuromodulation and Rehabilitation) and Feevale University. Novo Hamburgo, RS, Brazil.

Objective: This study aims to report the effects of repetitive transcranial magnetic stimulation (rTMS) in a pregnant patient with idiopathic neuropathic pain, aiming to be a non-drug method of treatment in pregnant women.
Methods: Female, 37 years old, pregnant at 34 weeks, with a history of chronic pain since adolescence. The present symptoms were a pain in the soles of the feet and in glove-shaped hands, which improved with cold and worsened with heat. An extensive search for differential diagnoses was carried out, which ruled out viral diseases, hypothyroidism, Diabetes Mellitus, vitamin B alterations, rheumatologic diseases, metabolic diseases, multiple myeloma, and Fabry disease. As the patient refused to undergo drug treatment during pregnancy, the aim of treatment with rTMS was to improve quality of life and reduce pain symptoms. An rTMS protocol for chronic pain was initiated with 10 sessions and applied 5 days a week for 2 weeks. Neurosoft equipment, NEURO-MS/D, double cone bobin, with excitatory stimulus of 10Hz, M1 region (80%), contralateral to the pain site, 3000 pulses, relative amplitude of 32%, for 20 minutes each session.

Results: She had developed a significant decrease in chronic pain, with an evolution from pain intensity 8 to pain 2. The pain was controlled without the use of medication.
Conclusion: Neuropathic pain is still challenging for clinical and experimental researchers, especially in pregnant patients whose drug therapies are restrictive due to teratogenic effects. However, with the use of the rTMS protocol, we can observe a significant improvement in this patient's chronic pain without offering adverse effects and risks for pregnancy.

ASSESSMENT OF THE RELATIONSHIP BETWEEN CATASTROPHISM, FUNCTIONAL DISABILITY, DEPRESSIVE SYMPTOMS, AND THE DESCENDING MODULATORY SYSTEM OF PAIN IN FIBROMYALGIA

Yasmim S. de Almeida[1], *Wolnei Caumo[2], Camila F.S Alves[3], Leticia Ramalho[4], Stela M. J Castro[5]*
[1]Medical student at the Federal University of Rio Grande do Sul, UFRGS, Porto Alegre, RS, Brazil.

Objective: To verify the effects of transcranial direct current stimulation (tDCS) associated with kinesiotherapy: myofascial release and facial mimics in a patient with Bell's Palsy, analyze the degree of facial palsy using the House-Brackmann scale and grade synkinesis using the scale of Synkinesis.
Methods: The present work is a case study, based on the individual analysis of a patient with a previous diagnosis of Peripheral Facial Palsy. The service was based on 30 minutes daily of kinetic exercises, with 15 minutes for fascia release and 15 minutes for facial mimicry, on both sides. Fifteen consecutive interventions were performed at 2-day intervals, every five sessions. The scales were applied again on the 10th and 15th day to reassess the results. There was a significant decrease in the level of paralysis, going from grade III to grade II, while synkinesis remained stable at grade I.
Discussion: It is concluded that the performance of electrostimulation in a patient with PFP obtained relevant results, showing an improvement in the degree of Facial Paralysis and in the control of synkinesis in certain movements performed, when applying the comparison scales after the execution of tDCS and kinesio-therapy. Thus, further in-depth studies on the use of neuromodulation are suggested as it proves to be effective in clinical sequelae.

EFFECTS OF THE COMBINATION OF TWO REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) PROTOCOLS IN A PATIENT WITH UPPER MOTOR NEURON SYNDROME: A CASE REPORT

Vitor Sossai Bozzi[1], *Francisco Mateus Vieira[1], Débora Cavalini Gabriel[1], Letícia Martins Gonçalves[1], Patrício Alves de Souza[1], Dâmaris Manfro Pinto Garcia[1], Maria Cecília Rodrigues Henckel[1], Isabela Martins Lamas[1], Paola Amaral Amarilho Freitas[1], Bárbara Caetano Piuco[1], Ana Carolina Storch Klein[1], Júlia Menegatti Urban[1], Júlia Gabriela Storch Klein[1], Camila Samrsla Moller[1], Thaizi Andreoli de Paris[1], Weslen de Moura Moraes[1], Andressa de Souza[1], and Jairo Alberto Dussán-Sarria[1]*
[1]Inerva Institute (Advanced Neuromodulation and Rehabilitation) and Feevale University. Novo Hamburgo, RS, Brazil.

Objective: This study focuses on reporting the effects of repetitive transcranial magnetic stimulation (rTMS) in a patient with Upper Motor Neuron Syndrome (UMNS) and evaluating the evolution of symptoms. It is a serious case, with no cure, with encouraging results.
Methods: Female, 53 years old, without comorbidities, evolved in a period of 5 years with a neurological picture suggestive of UMNS. Hypotheses like Amyotrophic Lateral Sclerosis, Multiple Sclerosis and Capsular Stroke were ruled out. The symptoms evaluated were severe chronic pain (8/10), spasticity, hyperreflexia, imbalance, dysarthria, thoughts of rumination, and hopelessness. The objective of the treatment was to give the patient a better quality of life, reducing symptoms. The initial protocol used was for a pain control: 10 sessions on consecutive working days of rTMS applied in M1 (EEG system 10-20), 10Hz, 90% Motor Threshold (MT) 2500 pulses, for 20 minutes, Neurosoft equipment, NEURO-MS/D, double cone bobbin. After pain control, we applied a second protocol, aiming to reduce spasticity, applied 5Hz, 100% MT, 1000 pulses, for 10 minutes, bilaterally (M1 and M2), 5 days a week for 4 weeks.
Results: There was a decrease in chronic pain and spasticity symptoms in the first sessions, maintaining a 0/10 pain intensity. After the application of the two protocols, the patient continues to be followed up at the neuromodulation service to control imbalance and dysarthria, which are still present to a lesser extent.
Conclusion: Response to rTMS should be defined as a reduction in pain intensity of $\geq$ 2 points or 30%. Treatment with rTMS provided a reduction in pain and spasticity in a patient with upper motor neuron syndrome.

TRANSCRANIAL DIRECT CURRENT STIMULATION (TDCS) USE FOR THE MAINTENANCE TREATMENT OF A DEPRESSIVE EPISODE IN BIPOLAR DISORDER: A CASE REPORT

Juliana Fernandes Tramontina[1], *Victor Couto da Silveira Araújo[2]*
[1]Adjunct Professor of Psychiatry and Preceptor of the Medical Residency Program in Psychiatry at Universidade Federal de Ciências da Saúde de Porto Alegre; [2]Resident in Psychiatry at Universidade Federal de Ciências da Saúde de Porto Alegre.

Objective: The purpose of this case report was to share the effectiveness of using tDCS as an alternative to maintenance treatment for Bipolar Depression after electroconvulsive therapy (ECT).
Methods: Data were collected from interviews and medical records.
Results: A 70-year-old patient presented with bipolar disorder since she was 35 years old. After several treatments for mood stabilization, in 2018, she had a course of 14 sessions of ECT, and in April 2019, she had 5 ECT sessions with good response. In August 2019, the patient had a new depressive episode (HAMD=17) and refused a new course of ECT due to cognitive impairment. Thus, a cycle of 15 daily sessions of tDCS was initiated. The patient showed a good response to tDCS, with remission of the depressive episode (HAMD=0 at the end of 15 sessions). She remained stable until December 2019, when she showed new symptoms of depression (HAMD = 10). The patient decided to buy the tDCS device by herself and thus was oriented on legislation, risks, and benefits; a family member was instructed to place the montage and was supervised by video. She signed an informed consent form. Again, the patient entered remission of symptoms (HAMD=0) after 15 daily sessions. In March 2020,

the patient had a new episode of depression (HAMD=9), and a new cycle of 10 tDCS daily sessions followed by twice or 3 times a week was performed. ML has remained stable ever since. (Maximum HAMD=6).
Discussion: The patient managed to remission a depressive episode with a tDCS treatment after two cycles of ECT.

CHARACTERIZATION OF NON-MOTOR SYMPTOMS IN A PHYSICALLY ACTIVE SAMPLE WITH PARKINSON'S DISEASE PRELIMINARY DATA

***Valton da Silva Costa*[1], *Thalita Frigo da Rocha*[1], *Maryela de Oliveira Menacho*[1], *Augusto José Mendes*[2], *and Anna Carolyna Lepesteur Gianlorenço*[1]
[1]Neuroscience Laboratory, Physical Therapy Department, Federal University of São Carlos,13565-905, São Carlos Campus, Brazil.

Objective: This study characterizes non-motor symptoms (NMS) in a sample with Parkinson's disease (PD) and their associations with the level of physical activity (PA).
Methods: Preliminary data from the 1st phase of a clinical study were analyzed using a cross-sectional, descriptive, and inferential approach. The study received approval from the research ethics committee (UFSCar, approval n. 5.230.655) and free consent from the participants.
Results: The sample (n = 16, 11 men, 5 women) is in Hoehn and Yahr stages 1-3, is 63±9.86 years old, physically active, and literate with a score of 26.38±3.28 on the MMSE. In this sample, PA level and volume correlated with the cognitive profile. The only correlation between PA and NMS was with depressed mood (UPDRS I) in an inversely proportional manner (rho = -0.648, $p < 0.01$). There was no correlation between PA and schooling but between this and the cognitive profile. The severity of NMS (UPDRS I) correlated with the difficulty in performing func-tional activities (UPDRS II) and with the severity of the disease (UPDRS total), as well as with symptoms of depression (GDS). There was also an association between depressive symptoms and anxiety levels (ABI) and between these and the difficulty in performing functional activities.
Discussion: Preliminarily, we concluded that NMS affects functionality and correlates with the severity of PD. Depressive symptoms and anxiety seem to be more associated with functionality than cognitive symptoms. General physical activity probably benefits cognitive function, but specific physical exercise modalities need to be studied in this population.

DUAL-TASK PERFORMANCE AND COGNITIVE DEMAND IN A SAMPLE WITH PARKINSON'S DISEASE (PD) PRELIMINARY DATA

***Valton da Silva Costa*[1], *Thalita Frigo da Rocha*[1], *Thanielle Souza Silva Brito*[1], *Maryela de Oliveira Menacho*[1], *Augusto José Mendes*[2], *and Anna Carolyna Lepesteur Gianlorenço*[1]
[1]Neuroscience Laboratory, Physical Therapy Department, Federal University of São Carlos,13565-905, São Carlos Campus, Brazil.

Objective: This study compared the performance of the simple motor task (ST) with the dual cognitive task (DT) and the DT with increased cognitive demand (CD) and correlated the cognitive function with the performance obtained. The study received approval from the research ethics committee (UFSCar, approval n. 5.230.655) and free consent from the participants.
Methods: Data from the 1st phase of a clinical study were used. We compared data from the simple Timed-Up and Go (TUG) and with verbalization of animal names (TUG-DT) and from the Trail Making Test parts A and B (TMT-AB). Association analysis was performed between these and the Addenbrook Cognitive Examination-Revised (ACE-R).
Results: The sample had greater difficulty in performing DT than ST. Demand was higher in TUG-DT duration (23.5%) than in the number of steps (14.0%). The increase in CD resulted in greater difficulty in performing the TMT, with a very high cost (152.8%).
Discussion: It was observed that those with a lower cognitive deficit have a better performance in the duration of the DT. The cognitive subdomain that bests correlate with performance appears to be associated with task-specific demands: memory and visuospatial function on the TUG-DT and fluency and language on the TMT A. However, when a second CD was added (TMT B) there was an absence of any association with cognitive function and subdomains (it demands further investigation). The cost of DT in TMT reflects only the increase in CD, without associations with specific cognitive domains (ACE-R).

EFFECT OF TRANSCUTANEOUS AURICULAR VAGUS NERVE STIMULATION ON INFLAMMATION, CARDIAC AUTONOMIC MODULATION AND CLINICAL SYMPTOMS OF INDIVIDUALS WITH COVID-19: A RANDOMIZED, BLIND, AND CONTROLLED TRIAL

***Paulo Henrique Leite Souza*[1], *Laura Uehara*[1], *Raphael Mendes Ritti Dias*[1], *Gustavo Oliveira da Silva*[1], *Wellington Segheto*[1], *Kevin Pacheco-Barrios*[2,3], *Felipe Fregni*[2], *João Carlos Ferrari Corrêa*[1], *and Fernanda Ishida Corrêa*[1]
[1]Doctoral and master's Program in Rehabilitation Sciences, Nove de Julho University, São Paulo, Brazil; [1]Neuromodulation Center and Center for Clinical Research Learning, Spaulding Rehabilitation Hospital and Massachusetts General Hospital, Harvard Medical School, Boston, USA.

Objective: To evaluate the effects of transcutaneous vagus nerve stimulation (taVNS) on inflammation, cardiac autonomic modulation, and clinical outcome of hospitalized individuals affected by COVID-19.
Methods: A randomized, controlled, blinded clinical trial in which 52 adult subjects hospitalized with COVID-19 were randomized to receive active taVNS (a-taVNS) or sham taVNS (s-taVNS). The a-taVNS was applied for 90 minutes on the left tragus, twice a day, for seven days, totaling 14 sessions; for the s-taVNS, the device remained off. Inflammatory mediators' interleukin-6 (IL-6), interleukin-10 (IL-10), C-reactive protein (CRP), cortisol, and heart rate variability (HRV) pre- and post-intervention were evaluated. Clinical evolution, which included clinical signs of the disease and levels of anxiety and depression, was evaluated pre- and post-intervention and at 7 and 14 days of follow-up. Attention and memory levels were also monitored after 7 and 14 days and monthly for 6 months after the end of the interventions.
Results: There was a significant reduction in CRP ($p=0.038$) and IL-6 ($p<0.001$) for the experimental group. There were no changes in IL-10, cortisol, and HRV results ($p>0.05$) in both groups. In the clinical evolution, there were no changes in the variables in the evaluated periods, except for a significant decrease in the level of depression ($p=0.031$) for the a-taVNS group.

Conclusion: taVNS decreased the levels of inflammatory mediators CRP and IL-6 and the level of depression; however, it did not interfere with cardiac autonomic modulation and other clinical symptoms.

IMPACT OF REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) IN THE TREATMENT OF A PATIENT WITH PANIC DISORDER: A CASE REPORT

***Vitor Sossai Bozzi*[1], *Letícia Martins Gonçalves*[1], *Francisco Mateus Vieira*[1], *Débora Cavalini Gabriel*[1], *Patrício Alves de Souza*[1], *Dâmaris Manfro Pinto Garcia*[1], *Maria Cecília Rodrigues Henckel*[1], *Isabela Martins Lamas*[1], *Paola Amaral Amarilho Freitas*[1], *Bárbara Caetano Piuco*[1], *Ana Carolina Storch Klein*[1], *Júlia Menegatti Urban*[1], *Júlia Gabriela Storch Klein*[1], *Camila Samrsla Moller*[1], *Thaizi Andreoli de Paris*[1], *Weslen de Moura Moraes*[1], *Andressa de Souza*[1], *and Jairo Alberto Dussán-Sarria*[1]**

[1]Inerva Institute (Advanced Neuromodulation and Rehabilitation) and Feevale University. Novo Hamburgo, RS, Brazil.

Objective: The purpose of the report is to show how neuromodulation can act incisively in treating panic disorder (PD). It is a rare and innovative narration in literature.
Methods: Male patient, 62 years old, diagnosed with PD, anxiety, and previous food compulsiveness. He was using 10mg zolpidem, 10mg diazepam, and 150mg pregabalin, with insufficient pharmacological response that directly compromised his quality of life, as he had recurrent episodes of claustrophobia and incessant fear. Thus, rEMT was applied using a NEURO MS/D stimulator (Neurosoft Inc), double cone coil, in the right dorsolateral prefrontal cortex, in 20 sessions, applied 5 days a week for 4 weeks. The stimulation protocol used was PRIMING, which corresponds to two distinct phases of stimulation, one following the other, at the same location in the cortex. The first rEMT phase of 6 Hz, 90% of the resting motor threshold (LM), 600 pulses, duration of 9:32 minutes. The second phase rEMT from 1 Hz to 110% of LM, 900 pulses, for 14:59 minutes.
Results: A significant decrease in symptoms was seen in the first sessions; the patient was gradually weaned from the drugs and decreased his score on the Beck Anxiety Inventory.
Conclusion: PD is a debilitating, recurrent disease and can be experienced by 22% of the population throughout their lives. In addition, the side effects caused by the drugs used for PD, together with the significant proportion of relapses of the disease, trace an incessant search for new therapies. Neuromodulation is an area that has given hope to these individuals, given the promising response of recently published studies on rEMT and TP.

NONLINEAR ANALYSIS OF HEART RATE VARIABILITY DURING TRANSCRANIAL DIRECT CURRENT STIMULATION (tDCS) COMBINED WITH VIRTUAL REALITY (VR) IN ADULTS WITH SPINAL CORD INJURY

***Giovanna de Paula Vidigali*[1], *Nadja Moreira da Silva*[1], *Fernanda Rocha Corrêa*[1,3], *Lilian Del Ciello de Menezes*[1,2], *Ibis Ariana Peña de Moraes*[3], *Talita Dias da Silva*[1,2,3], *and Carlos Bandeira de Mello Monteiro*[1,2,3]**

[1]Grupo de Pesquisa e Aplicações Tecnológicas em Reabilitação (PATER), Escola de Artes, Ciências e Humanidades, Universidade de São Paulo (EACH-USP), São Paulo, Brazil; [2]Programa de Pós Graduação em Cardiologia da Escola Paulista de Medicina da Universidade Federal de São Paulo (UNIFESP), São Paulo, Brazil. [3]Programa de Pós Graduação em Ciências da Reabilitação, Faculdade de Medicina da Universidade de São Paulo (FMUSP), São Paulo, Brazil.

Objective: To investigate the non-linear indices of Heart Rate Variability (HRV) in people with spinal cord injury during Virtual Reality (VR) activity combined with Transcranial Direct Current Stimulation (tDCS).
Methods: Eighteen participants of both sexes, aged between 21 and 57 years, with injury levels from C5 to T6, were evaluated. The HRV assessment was performed in 3 moments: rest (M1), tDCS + rest (M2), and tDCS + RV (M3), each lasting 10 minutes. The application of tDCS was anodic and bilateral, with 3mA on the primary motor cortex, divided into 1.5mA on each target electrode, and the participants were divided into the Sham group and Active group. This stage of the project was carried out in an intervention. The separation of the two groups was carried out in a randomized, double-blind, and parallel manner.
Results: Eighteen subjects were analyzed (9 Active groups and 9 Sham). There was a statistically significant difference between moments in the nonlinear SD2 indices (no difference for the groups), in which there was an increase between M1 and M2 (M1 = 22.5, M2 = 30.1, p = 0.050), and a decrease between M2 and M3 (M3 = 19.1, p= 0.004), no statistical difference was found in the SD1 and SD2/SD1 indices.
Discussion: Combined tDCS therapy, regardless of being sham or active, associated with VR appears to improve autonomic modulation of heart rate and may be a tool to improve cardiovascular health.

EFFECT OF COMBINED THERAPY OF VIRTUAL REALITY (VR) AND TRANSCRANIAL DIRECT CURRENT STIMULATION (tDCS) ON AUTONOMIC CARDIAC MODULATION IN ADULTS WITH SPINAL CORD INJURY

***Nadja Moreira da Silva*[1], *Giovanna de Paula Vidigal*[1,3], *Fernanda Rocha Corrêa*[1,3], *Lilian Del Ciello de Menezes*[1,2], *Carlos Bandeira de Mello Monteiro*[1,3], *and Talita Dias da Silva*[1,2,3]**

[1]Grupo de Pesquisa e Aplicações Tecnológicas em Reabilitação (PATER), Escola de Artes, Ciências e Humanidades, Universidade de São Paulo (EACH-USP), São Paulo, Brazil; [2]Programa de Pós Graduação em Cardiologia da Escola Paulista de Medicina da Universidade Federal de São Paulo (UNIFESP), São Paulo, Brazil. [3]Programa de Pós Graduação em Ciências da Reabilitação, Faculdade de Medicina da Universidade de São Paulo (FMUSP), São Paulo, Brazil.

Objective: To investigate the effect of Transcranial Direct Current Stimulation (tDCS) associated with Virtual Reality (VR) in the regulation of the Autonomic Nervous System (ANS) in adults with spinal cord injury.
Methods: Participants aged between 21 and 57 years, of both sexes, and injury level from C5 to T6, were assessed ANS using the Heart Rate Variability (HRV), at 3 moments: rest (M1), with stimulation (M2), and stimulation during the VR game (M3). Each moment lasted 10 minutes. Stimulation with tDCS was randomized into two, sham or active groups (anodic and bilateral

with 3mA over the primary motor cortex, 1.5mA on each target), double-blind and parallel.
Results: 18 subjects were analyzed (9 Active and 9 Sham). A significant difference was found for the Group in the indices (LF n.u. p = 0.044; HF n.u. p = 0.044 and LF/HF p = 0.012), showing that the Active group had a higher HF (M = 40.9), lower LF (M = 58.7) and LF/HF ratio (M = 1.9) than the Sham group (HF M = 27.5; LF M = 72.3; LF/HF M = 4.4). There was a difference between the groups in M3 in the LF/HF ratio (p = 0.025).
Discussion: CVR therapy appears to stimulate a decrease in sympathetic modulation, and an increase in parasympathetic stimulation, resulting in a better sympathovagal balance, even with damage above the nerve roots of the sympathetic nervous system, which may lead to speculation of greater control humor of the ANS.

PHYSICAL EXERCISE IN UPPER LIMB FUNCTION OF THE INDIVIDUALS WITH PARKINSON'S DISEASE: A SYSTEMATIC REVIEW

Maryela Oliveira Menacho[1], *Valton da Silva Costa[1]*, *Anna Carolyna Lepeuster Gianlorenço[2]*
[1]Postgraduate Program in Physical Therapy, Federal University of Sao Carlos, Sao Carlos, Brazil; [2]Physical Therapy Department, Federal University of Sao Carlos, Sao Carlos, Brazil.

Objective: To review the effects of physical exercise on the motor function of the upper limbs of individuals with Parkinson's disease (PD).
Methods: A systematic literature search, including articles published until August 2022 in PubMed, Embase, CENTRAL, PEDro, Scopus, and Web of Science databases, was conducted, according to the PRISMA Statement. The combinative keywords used for searching were Parkinson's disease, exercise/physical therapy, and upper limb and the entry terms. These terms were combined using Boolean operators according to each database. The inclusion criteria of the studies were: (1) randomized controlled trials; (2) that evaluated the effectiveness of the upper limb exercises; (3) outcomes related to the upper limb function. As exclusion criteria were used: (1) other study designs; (2) abstracts; (3) trials that included subjects with atypical or secondary parkinsonism; and (4) trials that performed exercises not specific for upper limbs.
Results: Twelve studies were included, with a total of 493 participants. The interventions performed were dexterity training, strength training, aerobic exercise, drum playing, oriented task training, constraint-induced therapy, virtual reality, and robotic therapy. Outcome measures included: Nine Hole Peg Test, Manual Ability Measure Questionnaire, Box and Block Test, Purdue Pegboard Test, Fugl-Meyer Assessment, Action Research Arm Test, Unified Parkinson's Disease Rating Scale, Disabilities of the Arm, Shoulder, and Hand, Jebsen Taylor Hand Function Test and Handwriting Test. Most interventions improved the dexterity and motor function of the upper extremity.
Conclusion: Dexterity and task-oriented training should be incorporated into the therapeutic program of PD patients.

CORRELATION BETWEEN MUSIC AND TRANSCRANIAL DIRECT CURRENT STIMULATION: AN INTEGRATIVE LITERATURE REVIEW ON THE MOST CURRENT FINDINGS

Maria Luiza da Conceição[1], *Laura Giotto Cavalheiro[2]*, *Leonardo França Santos[3]*
[1]Speech and Hearing Therapist Master in Health Sciences at the Federal University of Bahia (UFBA); [2]Speech Therapist Master in Degree in Human Communication Disorders from the Federal University.

Objective: Check the panorama of publications regarding the involvement of the use of tDCS and music.
Methods: It is characterized by being a qualitative study of bibliographic nature, being an integrative literature review that carried out the data collection in the VHL, LILACS, SciELO, MEDLINE and PUBMED databases using the descriptors 'Music and Transcranial Direct Current Stimulation', ' music and transcranial direct current stimulation', articles in English and Portuguese were selected. As for the inclusion criteria, they were articles selected between 2010 and 2022, which had the theme related to music and tDCS.
Results: 56 studies were found in total, and when the inclusion criteria were applied, 41 articles were identified in a way that really related to interventions related to the subject of the study. The surveys found were mainly in the areas of treatment for tinnitus; memory emotion related to favorite music of elderly people; the relationship between music and prefrontal; musician's dystonia; stimulation in the auditory cortex; stroke rehabilitation and verification of differences between musicians and non-musicians' memory skills after using CSDT.
Discussion: To observe the need to carry out more studies that address the intervention process of Transcranial Direct Current Stimulation associated with music in different contexts of age groups, brain location of neurostimulation, previous musical history, presence or absence of disorders, pathologies, or any other cognitive alterations, therefore, it is important that there be an extension of research promotion, in order to observe the main potentialities and challenges of direction directed to the specific demands of each individual.

TRANSCRANIAL DIRECT CURRENT STIMULATION: CONTENT BROADCAST ON SOCIAL MEDIA NETWORKS

Maria Luiza da Conceição[1], *Laura Giotto Cavalheiro[2]*, *Leonardo França Santos[3]*
[1]Speech and Hearing Therapist Master in Health Sciences at the Federal University of Bahia (UFBA); [2]Speech Therapist Master in Degree in Human Communication Disorders from the Federal University.

Objective: Post verification on the social network Instagram related to non-invasive Neuromodulation of the Transcranial Current Stimulation type.
Methods: The study is based in an exploratory-descriptive way, it does not qualify the participants to an exposure through texts that are registered in the Free and Informed Consent Term because they are publications published on a digital social network. The collection took place through publications on Instagram with two hashtags, #transcranialstimulationporcorrentecontinua and #transcranialdirectcurrentstimulation, as they are terms indexed

in the Health Sciences Descriptors (CS). Inclusion criteria were images, reels, and videos, followed using hashtags in Portuguese and/or English, regardless of the description of the publication. Exclusion criteria: Content related to other neuromodulation practices, archived, or excluded publications. Two smartphones and a computer were used as instruments for data collection.
Results: The hashtag #stimulation until August 18, September 2, with respect to the hashtag #transcranial-porcurrentcontinues, was used on 144 days later from September 4, until June 202, with respect to the hashtag #transcranialdirect, which was August 20, 2019. September, with respect to the hashtag #transcranialdirect, was August 20, 2032, with respect to the hashtag of August 20, 2022. Publications with technical information related to tDCS, publications relevant to the dissemination of events, reports from professionals and patients, motivational messages, information about places that use a technique, and dissemination of devices and materials.
Discussion: Despite being a technique with greater clarification without recent publications with more than a virtual environment, publications such as publications are not even linked to a technical content linked to the searched procedure.

ATTENTION, MEMORY, AND NOMINATION DIRECTLY BENEFITED FROM TRANSCRANIAL MAGNETIC STIMULATION (TMS) AFTER A STROKE

***Fernanda Vieira Moraes*[1,2], *Sandra Barboza Ferreira*[2], *Angela Costa Souza*[1], *Denise Sisterolli Diniz*[2]
[1]CRER, Brazil; [2]UFG, Brazil.

Objective: The aim of this study was to investigate the TMS effect on the cognition of patients who have suffered a stroke.
Methods: A group of 30 patients between 24 and 74 years was selected in the neuromodulation sector in a specialized physical medicine center. They were evaluated using the Montreal Cognitive Assessment (MOCA), a screening cognitive test which is more used to detect mild cognitive impairment and that has been used in the context of stroke. The TMS protocol consisted of 20 sessions of 20 minutes twice a week. This study was approved by the Research Ethics Committee of Hospital das Clínicas of the Universidade Federal de Goiás, under protocol 54977216.3.0000.5078. All participants who agreed to participate in the study had all their doubts clarified and signed the Informed Consent Form (ICF).
Results: The total scores obtained of the Moca in the period pre- and post-intervention were respectively: [19, 43 (3,71) in contrast to 21,30 (4,25)]. The Wilcoxon comparison test between averages indicated $p < 0,05$. The statistical analyses still indicated, in the subtests of attention, memory, and nomination, [3,20 (1,49); 2,10(1,63); 2,10 (1,63)] in contrast to [3,77 (1,48); 2,97 (1,88); 2,67(0,61)] in the pre-and post-intervention periods, respectively.
Discussion: These results allow us to state that the technique improves general cognitive performance and that the functions contributing to this improvement are related to attention, memory, and naming tasks.

MOTOR AND COGNITIVE IMPROVEMENTS IN A POST-HEMORRHAGIC STROKE PATIENT TREATED WITH TRANSCRANIAL MAGNETIC STIMULATION

***Fernanda Vieira Moraes*[1,2], *Sueli Toshie Inoue*[1], *Angela Costa Souza*[1], *Sandra de Fátima Barboza Ferreira*[2], *and Denise Sisterolli Diniz*[2]
[1]CRER, Brazil; [2]UFG, Brazil.

Objective: The aim of this study was related to the neuropsychological assessment process in the pre-and post-administration of the TMS technique.
Methods: The patient, a 56-year-old female with complete college education, a teacher who suffered a stroke in 2017 with a left motor impairment and a speech impairment. It was assessed before and after stimulation with the MOCA, as well as Fugl scale assessment. The TMS protocol consisted of 20-minute sessions twice a week. This study was approved by the Research Ethics Committee of Hospital das Clínicas of the Universidade Federal de Goiás, under protocol 54977216.3.0000.5078. All participants who agreed to participate in the study had all their doubts clarified and signed the Informed Consent Form (ICF).
Results: The total scores on the MOCA test in the pre-and post-intervention were respectively 14/17. The tests that contributed to the improved scores were the construction test: 3/4, attention 3/5, and language 0/1. From the qualitative standpoint we observed noteworthy improvements in the organization and planning during the drawing of the cube and of the clock as well as in verbal fluency in relation to which the re-production of words grew in number from 1 to 3, although from the quantitative standpoint this production represents only 1 point in the final score. In the Fugl Meyer assessment, the patient had improvements related to the motor function, 44/61, upper limbs 25/31, wrist 5/10, coordination and speed 0/6.
Discussion: Better scores in the cognitive assessment were modest; in the motor scale the improvements were robust with repercussions in functionality. The findings indicate the usage of the EMT technique to be promising.

THE USE OF NMDA ANTAGONISTS FOR THE SPINAL CORD INJURY TREATMENT

***Fernanda Cristina Poscai Ribeiro*[1], *July Samy Brasil*[1], *Vitor da Nóbrega Nascimento*[1], *Victoria Lobato Santos*[1], *Everton Lopes Rodrigues*[1]
[1]Universidade do Oeste Paulista - Campus Guarujá.

Objective: To define if NMDA antagonists are promising for treating spinal cord injury by preventing neurotoxicity from glutamate release and if there are reports of adverse reactions.
Methods: This integrative review used Scielo and Pubmed databases, and the keywords used were: "NMDA antagonist" OR "N-Methyl-D-aspartate antagonist" AND "Spinal cord trauma". Only works from 10 years ago or less were considered.
Results: Amantadine use improved angiogenesis and reduced inflammation. In addition to reducing oxidative stress, it decreased the hypersensitivity response, showing promise for treating neuropathic pain. MgSO4 reduced apoptosis and the presence of lymphocytes in the analyzed slides, mainly with the adjuvant use of z-LEDH-fmk, a caspase inhibitor. Besides reducing apoptosis, memantine also generated motor improvement and has promising results with Q-VD-Oph combination therapy. Riluzole

reduced cell death and inflammation; however, better results are obtained with the association of it with Q-VD-OPh.
Discussion: Although NMDA antagonists demonstrate effectiveness in SCI treatment in animals and a benefic association with caspase inhibitors, more studies about adverse effects and efficiency are still needed. Memantine, riluzole, MgSO4, and amantadine don't present serious adverse effects (principally memantine and amantadine, that are already used on a large scale for the treatment of Alzheimer's and Parkinson's Disease, respectively) and generated histologically improvement in cases of spinal cord trauma, proving promising for new studies.

EFFECT OF TRANSCRANIAL DIRECT CURRENT STIMULATION (tDCS) ON FATIGUE RESISTANCE OF THE OLDER PEOPLE BICEPS BRACHII MUSCLE: RANDOMIZED, CONTROLLED, BLIND, CROSSOVER STUDY

***Bianca Tiriba Gomes*[1]**, *João Carlos Ferrari Corrêa*[1], *Amanda Cristina da Silva Reis*[1], *Carolina Burian Parpineli*[1], *Felipe Fregni*[2], *and Fernanda Ishida Corrêa*[1]
[1]Programa de Doutorado e Mestrado em Ciências da Reabilitação da Universidade Nove de Julho – São Paulo-SP – Brasil, [2]Harvard Medical School, Center for Noninvasive Brain Stimulation, Cambridge, MA, United States.

Objective: To evaluate the effects of Transcranial Direct Current Stimulation (tDCS) on biceps brachii muscle fatigue in older people.
Methods: Thirty older people participated in the study, randomized to receive single sessions of active anodic, cathodic, sham, or no stimulation tDCS before the fatigue protocol, with an interval of 48h between interventions. The tDCS was applied for 20 minutes on the motor cortex, with 2mA intensity. The fatigue protocol consisted of concentric contractions biceps brachii muscle until reaching concentric failure at 80% of the maximum load of one repetition. Fatigue was assessed by the motor evoked potential (MEP) of the biceps brachii muscle using transcranial magnetic stimulation and by the biceps brachii muscle electrical activity assessed by surface electromyography. All evaluations were performed pre- and post-intervention, and the biceps brachii muscle electrical activity was evaluated during the fatigue protocol. To compare the muscle electrical activity between the groups, the general linear model test with Bonferroni correction was performed considering $p \geq 0.05$, to calculate the size effect of interactions between the electromyographic activity data, partial eta squared (p2) was used.
Results: There was no difference between muscle electrical activity during fatigue considering pre- and post-intervention moments (effect time and interaction $p>0.05$; $F=0.94$, $p=0.33$, $np2=0.006$). There was no difference in intragroup ($F=0.2196$, $p>0.05$) and intergroup ($F=0.705$; $p>0.05$) MEP.
Conclusion: A session of tDCS applied on the cortical motor area of the biceps brachii muscle did not interfere with the results of muscle fatigue in older people.

EFFECTIVENESS OF TRANSCRANIAL DIRECT CURRENT STIMULATION AT HOME IN DISABILITY SYMPTOMS OF FIBROMYALGIA: A FACTORIAL RANDOMIZED DOUBLE-BLIND CLINICAL TRIAL

***Bárbara Regina França*[1]**, *Rael Lopes Alves*[1,2], *Liciane Medeiros*[1,2], *Arthur França de Souza*[1], *Luana Villagran Lacerda Silva*[1], *Felipe Fregni*[1,3], *and Wolnei Caumo*[1,2,3,4,5]
[1]Laboratory of Pain & Neuromodulation at Hospital de Clínicas de Porto Alegre (HCPA), Porto Alegre, Brazil, [2]Post-Graduate Program in Medicine: Medical Sciences at Federal University of Rio Grande do Sul (UFRGS), Brazil.

Objective: This factorial randomized double-blind, controlled clinical trial (RCT) compared the active transcranial direct current stimulation (a-tDCS) over the left dorsolateral prefrontal cortex (DLPFC-l) or primary motor cortex (M1) with their respective sham-(s)-tDCS on disability due to pain in fibromyalgia.
Methods: This clinical trial was reviewed and approved by the Research Ethics Committee of Hospital de Clínicas de Porto Alegre (Registration No. 2017-0330). We included 102 subjects with fibromyalgia according to the ACR-2016 criteria, 30 to 65 years old. After signing an informed consent form, they were randomly assigned to one of four tDCS groups: left DLPFC (a-tDCS n = 34) and (s-tDCS n = 17); or tDCS on the M1 (a-tDCS n = 34) or (s-tDCS n = 17). They self-administered at-home 20 sessions of tDCS, 2mA for 20 min daily with remote supervision after presential training. The disability due to pain was assessed by the mean percentage change (MPV) in the score of disability related to fibromyalgia (DRF) as measured by the Profile of Chronic Pain: Screen (PCP: S) from pre-to post-treatment.
Results: A generalized linear model showed that there were statistically significant differences between the a-tDCS and s-tDCS groups. The MPV (SD) on the disability scale in the groups that received a tDCS over M1 vs. s-tDCS was -14.15 (19.45) vs. -4.19 (11.42) [X2= 3.19, Df =1, P=0.04)], while in DLPFC was -15 (13.12) vs. -1.10 (16.81) [X2= 11.06, Df =1, P=0.00)], respectively.
Conclusion: These results show the benefit of a-tDCS over DLPFC and M1 compared to s-tDCS in improving the DRF.

EFFECT OF HYPNOSIS AND TRANSCRANIAL DIRECT CURRENT STIMULATION ON PAIN PERCEPTION AND CORTICAL EXCITABILITY IN FIBROMYALGIA: A RANDOMIZED CROSS-CONTROLLED BLIND CLINICAL TRIAL

***Bruno Scheln1*[1,2]**, *Bárbara Regina França*[1,2], *Rodrigo Pereira de Almeida*[1], *Lucas Thomé*[1], *Paulo R S Sanches*[3], *Danton P Silva Jr*[3], *and Wolnei Caumo*[1,2,4,5]
[1]Laboratory of Pain & Neuromodulation at Hospital de Clínicas de Porto Alegre (HCPA), Porto Alegre, Brazil, [2]Post-Graduate Program in Medicine: Medical Sciences at Federal University of Rio Grande do Sul (UFRGS), Brazil.

Objective: To compare the effect of SAH, a-tDCS, and rest on the left dorsolateral prefrontal cortex (l-DLPFC) on pain measures [Cold Pressor Test (CPT) and heat pain threshold] in patients with fibromyalgia. To compare the effects of the techniques on motor evoked potential (PEM), short intracortical inhibition (IICC),

intracortical facilitation (FIC), and cortical silent period (PSC).
Methods: This is a randomized, blinded, crossover clinical trial, reviewed and approved by the Research Ethics Committee of Hospital de Clínicas de Porto Alegre (Registration Number 20190688). Eighteen women with fibromyalgia (FM) between 18 and 65 were included. After signing an informed consent form, they randomly received a-tDCS over the l-DLPFC (2mA), SAH, or rest.
Results: SAH compared to a-tDCS increased pain tolerance with a moderate effect size [Cohen f=- 0.78; (95% CI; -1.48 to -0.12)]. Compared with the rest test, SAH increased TPF tolerance with a large effect magnitude [Cohen's f=-0.87; (95% CI; -1.84 to -0.09)]. The a-tDCS, compared to the SAH increased the amplitude of the PEM with a large effect [Cohen's f=-1.73 (95% CI; -2.17 to -0.17)]. Likewise, the effect of a-tDCS compared to the rest test was of great magnitude in the PEM [Cohen's f=-1.03; (95% CI; -2.06 to -0.08)].
Discussion: The findings showed that SAH affects the counter-regulatory mechanisms involved in pain perception and tolerance, while tDCS increases the excitability of corticospinal pathways. Thus, they open new horizons for personalizing therapeutic approaches aimed at correcting the maladaptive neuroplasticity involved in the pathophysiology of fibromyalgia.

STRUCTURAL AND FUNCTIONAL BRAIN CONNECTIVITY IN PATIENTS WITH UPPER LIMB DYSTONIA

Artur José Marques Paulo[1], Danilo Donizete de Faria[2], João Ricardo Sato[1], Edson Amaro Junior[1], Vanderci Borges[2], Sonia Maria Cesar Azevedo Silva[2,3], Henrique Ballalai Ferraz[2,3], Joselisa Queiroz de Paiva[1]
Patricia de Carvalho Aguiar[1,2]
[1]Instituto de Ensino e Pesquisa, Hospital Israelita Albert Einstein; [2]Univ. Federal de São Paulo; [3]Hospital do Servidor Público Estadual.

Objective: To explore differences in brain activity and connectivity during motor tasks while observing possible structural changes underlying the pathophysiology in patients with focal dystonia.
Methods: This study was approved by the Institutional Review Boards of all participating sites. All volunteers provided informed written consent. Twenty-seven patients with right upper limb focal dystonia and twenty-six controls were scanned using a T1-weighted and diffusion-weighted MRI (Siemens-3T). They were assessed by electroencephalography during writing in terms of spectral power and effective connectivity. We conducted a region of interest analysis using the MRI data from the cortical thickness of the somatomotor area and fractal anisotropy (FA) of sensorimotor tracts and interhemispheric tracts controlling for sex and age.
Results: During the writing task, patients with dystonia showed increased power in the low-gamma rhythm in the bilateral somatomotor cortex and less attenuation in mu-beta and beta rhythms relative to controls (Table 1). Patients showed reduced interhemispheric connectivity at the low-gamma rhythm and reduced connectivity within the mu-alpha rhythm (Figure 1). In terms of brain structural changes, patients showed a trend of reduced mean FA values in the right sensory and primary motor corticospinal regions relative to controls (Table 2). No differences were detected in terms of cortical thickness. No significant structural differences were detected when correcting for multiple comparisons.
Discussion: Although we have shown spectral power differences during motor tasks in patients with dystonia, the underlying brain structural changes were not necessarily detectable. Interhemispheric effective connectivity is altered in patients with dystonia but without apparent differences in interhemispheric tracts. The right somatomotor cortex, ipsilateral to the dystonic hand, may play a role in functional and structural differences.

THE EFFECT OF HOME-BASED TRAN-SCRANIAL DIRECT CURRENT STIMULATION IN COGNITIVE PERFORMANCE IN FIBROMYALGIA: A RANDOMIZED, DOUBLE-BLIND SHAM-CONTROLLED TRIAL

Arthur França de Souza[1], *Paul Vicuña Serrano[1,2], Rael Lopes Alves[1,2], Bruno Schein[1,2], Liciane Medeiros[1,2], Yasmim Santana de Almeida[1], Felipe Fregni[1,3], and Wolnei Caumo[1,2,3,4,5]*
[1]Laboratory of Pain & Neuromodulation at Hospital de Clínicas de Porto Alegre (HCPA), Porto Alegre, Brazil, [2]Post-Graduate Program in Medicine: Medical Sciences at Federal University of Rio Grande do Sul (UFRGS), Brazil.

Objective: To evaluate the efficacy and safety of home-based Transcranial Direct Current Stimulation (tDCS) in treating cognitive impairment; if the dysfunction of the Descendant Pain Modulation System (DPMS) predicts the tDCS effect; if its effect is linked to changes in neuroplasticity measured by the Brain-Derived Neurotrophic Factor (BDNF).
Methods: This study was a randomized, double-blind, parallel, sham-controlled clinical trial reviewed and approved by the Research Ethics Committee of Hospital de Clínicas de Porto Alegre (Registration number: 2017-0330). We included 36 women with FM, aged 30 to 65 years old. After signing an informed consent form, they were assigned 2:1 to receive a-tDCS (n=24) or s-tDCS (n=12). Primary outcome: Trail Making Test of executive attention, divided attention, working memory (WM), and cognitive flexibility (TMT-B-A). Secondary outcomes: Controlled Oral Word Association Test (COWAT), WM by Digits - Wechsler Adult Intelligence Scale (WAIS-III), and quality of life. Twenty-minute daily sessions of home-based tDCS for four weeks (total of 20 sessions), 2mA (anodal F3; Catodal F4) prefrontal stimulation.
Results: GLM showed a main effect for treatment in the TMT-B-A [Wald X2=6.176; Df=1; P=0.03; ES=-1.48, CI 95% =-2.07 to-0.90]. a-tDCS effects vs. s-tDCS improved WM, verbal and phonemic fluency, and quality-of-life scale. The impact of a-tDCS on the cognitive tests was positively correlated with the reduction in BDNF from baseline to treatment end. BDNF decrease was positively associated with the improvement in the quality of life.
Discussion: 4-week daily treatment with a home-based tDCS device over l-DLPFC compared to TDCS improved the cognitive impairment in FM, and was well-tolerated, underlining its potential as an alternative treatment for cognitive dysfunction. Besides, the a-tDCS effect is related to DPMS dysfunction and changes in neuroplasticity.

THE IMPACT OF THE PLACEBO EFFECT IN THE TRANSCRANIAL DIRECT CURRENT STIMULATION IN FIBROMYALGIA

Arthur França de Souza[1], *Bruno Schein[1,2], Roman Orzechowski[1,2], Bárbara Regina França[1,2], Leandra Souza[1], Yasmim Santana de Almeida[1], Luana Villagran Lacerda Silva[1], Paulo R S Sanches[3], Danton P Silva Jr[3], Vânia Naomi Hirakata[1,4], and Wolnei Caumo[1,2,5,6,7]*
[1]Laboratory of Pain & Neuromodulation at Hospital de Clínicas de Porto Alegre (HCPA), Porto Alegre, Brazil; [2]Post-Graduate

Program in Medicine: Medical Sciences at Federal University of Rio Grande do Sul (UFRGS), Brazil.

Objective: This study assessed the susceptibility to a transcranial direct current stimulation (tDCS) placebo effect.
Methods: We included 103 right-handed patients with fibromyalgia (FM) according to the ACR 2016 criteria, aged 18 to 65 yrs old. This sample comprises patients eligible to participate in a randomized clinical trial for home tDCS. The study was approved by the Research Ethics Committee of Hospital de Clínicas de Porto Alegre (Registration Number 2020-0383). In this non-randomized trial, after signing an informed consent form, they were subjected to a simulated tDCS session applied to the dorsolateral prefrontal cortex (DLPFC), with the anodic pole on the left and the cathodic pole on the right for 20 min. The ramp-up time of stimulation was 20s for the current to go from zero to 2 mA and a ramp-down time of 20s. However, the device offered 30 seconds of stimulation across the 20 minutes at the following time points: at the beginning, after 10 min, and after 20 min. The change in the Numerical Pain Scale (NPS) score was used to measure the effect of tDCS. Larger placebo responders could decrease by 30% or more from the time before the intervention to the time after.
Results: According to this criterion, 40.77% (42/103) responded significantly to the placebo effect. According to NDT, the percentage of pain improvement was 10.11% in non-responders and 54% in responders.
Conclusion: A comparison of the percentage reduction between the groups of responders and no responders showed a significant difference ($p<0.001$). This study suggests that a simulated tDCS session at the DLPFC could reduce pain perception by a substantial placebo effect in patients with FM.

EFFECTIVENESS OF ACUTE TRANSCRANIAL DIRECT CURRENT STIMULATION ON PELVIC FLOOR MUSCLE CONTRACTION FUNCTION IN HEALTHY WOMEN: A RANDOMIZED, DOUBLE-BLIND, AND CONTROLLED SHAM STUDY PRELIMINARY RESULTS

Ângela Cristina Ledur[1], Marta Quezia Fontanelle[1], Cassia Giulliane Costa[1], Maria Eduarda Brandão Bueno[1], and Suhaila Mahmoud Smaili[1]
Camile Ludovico Zamboti[1]
[1]State University of Londrina, Brazil.

Objective: To evaluate the acute effect of transcranial direct current stimulation (tDCS) associated with pelvic floor muscle training (PFMT) on pelvic floor muscle function (PFMF) in women.
Methods: Cross-sectional, randomized, and double-blind study was conducted with healthy, nulliparous, and sexually active women. Participants were evaluated regarding PFMF with the PERFECT scheme and intravaginal pressure (IVP - PeritronTM). After the evaluation, they were randomized to the order of application of active or sham tDCS and submitted to treatments with a seven-day interval between applications and reassessed after each session. For both protocols, the current applied by the anode electrode was positioned over the supplementary motor area and the cathode over the supraorbital region, with 2mA of intensity for twenty minutes. Ten minutes of tDCS-active or sham-tDCS application was associated with PFMT. Statistical analysis was performed using the SAS Studio using Shapiro Wilk, Qui-quadrado and Wilcoxon tests.
Results: Five women (24±1,5 years and body mass index of 24±1,2Kg/m2) were included. Compared to the initial assessment, there was a tendency for improvement in the number of repetitions of PFM contractions after active-tDCS ($p=0.06$) and sham-tDCS ($p=0.06$) and for the endurance after sham-tDCS ($p=0.06$). There was no difference in muscle strength, number of fast contractions, and IVP after both protocols. Also, no difference was found between active-tDCS and sham-tDCS in PFMF and IVP($p>0.05$).
Discussion: These preliminary results demonstrated an acute positive effect in active and sham-tDCS for the number of PFM sustained contractions and endurance after sham-tDCS in women.

EFFECT OF TRANSCRANIAL DIRECT CURRENT STIMULATION COMBINED WITH PELVIC FLOOR MUSCLE TRAINING IN HEALTHY WOMEN: A RANDOMIZED, CONTROLLED, DOUBLE-BLIND CLINICAL TRIAL

Ângela Cristina Ledur[1], *Felipe Fregni[2] and Fernanda Ishida Corrêa[3]*
[1]State University of Londrina Hospital HU-UEL, Londrina, PR, Brazil; [2]Harvard Medical School, Center for Noninvasive Brain Stimulation, Cambridge, MA, United States; [2]University Nove de Julho (UNINOVE), São Paulo, SP, Brazil.

Objective: To evaluate the effect of Transcranial Direct Current Stimulation (tDCS) associated with pelvic floor muscle training (PFMT) on pelvic floor muscle (PFM) contraction function, sexual function, and quality of life in healthy women.
Methods: 32 sexually active adult nulliparous women were randomized into two intervention groups: G1 (active tDCS combined with PFMT) and G2 (sham tDCS combined with PFMT). Stimulation was performed with the anode electrode over the supplementary motor area and the cathode over the supraorbital region, with a current intensity of 2mA, for 20 minutes. Associated with stimulation, PFMT was performed with a biofeedback device. The training was conducted 3 times a week for 4 weeks, totaling 12 sessions. The function of the MAPs was evaluated by the scheme PERFECT and the perineometer (PeritronTM); the sexual function by The Female Sexual Function Index (FSFI), and quality of life by the Questionnaire SF-36.
Results: The G1 MAP function increased in 14 cmH2O ($p=0,00$) after training, but these results were not maintained in the 30-day follow-up. G2 showed an increase of 10 cmH2O ($p>0,05$), maintaining this result in the 30-day follow-up. For the FSFI there was no difference in both groups ($p>0,05$). In the general state of health assessed by the SF-36, there was significant improvement ($p=0,02$) for G1 after training and no change for G2 ($p=1,0$).
Conclusion: The tDCS combined with the pelvic floor muscle training improved PFM function but did not potentiate the effect of therapy after follow-up.

HIGH-FREQUENCY MAGNETIC STIMULATION AND SPEECH APRAXIC

Andréia Estér Puhl[1], *Nedi Magagnin[1]*
[1]Institute Umani, Brazil.

Objective: Demonstrate the improvement of speech articulation in a severely apraxic patient, after an ischemic stroke, of both cerebral hemispheres, due to dehydration, within 3 months of evolution.
Methods: Application of high-frequency transcranial magnetic stimulation with a circular coil for 30 days in a patient with severe

acquired apraxia.
Results: After 30 days of daily treatment, the patient began to speak vowels and phonemes, monosyllables, and disyllables and progressed to small sentences.
Conclusion: Transcranial magnetic stimulation and high frequency can be important in rehabilitating severe acquired apraxic, improving speech intelligibility and communication functionality.

SOCIAL IMPACT OF NEUROMODULATION AS A TOOL FOR PERSONALIZED INTENSIVE NEUROREHABILITATION (PIN)

Andréia Estér Puhl[1], *Nedi Magagnin*[1]
[1]Institute Umani, Brazil.

Objective: Demonstrate the social impact (work, family, and community) of the use of transcranial neuromodulation associated with intensive personalized neurorehabilitation.
Methods: Analysis of the Umani Clinic database - Passo Fundo/RS. In the period from October 1, 2021, to October 1, 2022.
Results: Seventy percent of the patients treated by the personalized intensive neuromodulation method were re-inserted into their functional activities.
Conclusion: In this period, it was found that transcranial neuromodulation is an important tool to enhance personalized intensive neurorehabilitation, allowing the patient to return to their functional activities, thus improving the levels of interaction in the family, at work, and in society. The assessment was performed using the international classification of functionality, disability, and health (ICF).

TRANSCRANIAL MAGNETIC STIMULATION AS A TECHNOLOGICAL RESOURCE IN MOVEMENT DISORDERS: A BRIEF LITERATURE REVIEW

Ana Lucia Molina1[1]
[1]Fundação Educere de Campo Mourão, Brazil.

Objective: To describe the benefits of the transcranial magnetic stimulation technique in the improvement of motor symptoms and its real application as a tool for the functional recovery of patients with movement disorders.
Methods: Systematic literature review in databases and scientific portals (Pubmed, Lilacs, Scielo, Pedro), where publications in English, Spanish and Portuguese were used as references, from December 2021 to June 2022. Articles were excluded whose sample consisted of other forms of neuromodulation.
Results: Twenty-one studies were analyzed, with criteria for the application of TMS for the treatment of movement disorders, which showed variable positive results (due to individual variables) with magnetic neuromodulatory therapy, ranging from improvement in motor coordination, fine psychomotricity, range of motion and in bradykinesia.
Conclusion: The rehabilitation of motor symptoms through the non-invasive technique of magnetic stimulation has shown great levels of clinical/scientific evidence in the improvement of movement disorders, being a potential treatment strategy, without side effects and faster results in the rehabilitation process, showing that potentially a modulator of sensorimotor integration and cortical reorganization. Thus, more studies focused on specific disorders for different samples are needed.

EFFECTS OF TRANSCRANIAL MAGNETIC STIMULATION ON SPASTICITY IN MULTIPLE SCLEROSIS - PILOT STUDY

Amanda Cristina da Silva Reis[1], *Bruno Paulino Venâncio*[1], *Cristina Theada Ferreira*[1], *Andrea Fialho do Prado*[1], *Lucimara Guedes dos Santos*[1], *Aline de Souza Gravatá*[1], *Larissa Lima Gonçalves*[1], *Isabella Aparecida Ferreira Moretto*[1], *João Carlos Ferrari Corrêa*[1], *Fernanda Ishida Corrêa*[1]
[1]Universidade Nove de Julho, São Paulo, Brazil.

Objective: To evaluate the effect of Transcranial Magnetic Stimulation (TMS) on quadriceps spasticity in individuals diagnosed with Multiple Sclerosis (MS).
Methods: This is a Clinical, crossover study, in which 8 adult subjects diagnosed with MS and quadriceps spasticity read and signed the informed consent form and were randomized to the first intervention, which could be high-frequency ($\geq$5Hz) or low-frequency ($\leq$1Hz) TMS over motor cortex (M1), hotspot for quadriceps. The second session was opposite to the first. To assess spasticity, the Ashworth scale was applied and the latency time (ms) of the motor evoked potential (MEP) and the central motor conduction time (MCCT) of the bilateral quadriceps muscle were analyzed. Assessments were performed pre- and post-interventions.
Results: For the 5 Hz protocol, there was a decrease in latency time on the contralateral side to the stimulus (p=0.001), with no significant difference for the homolateral side (p=0.115). For the 1hz protocol, there was no difference in bilateral latency time (p=0.061 and p=0.084). The CMCT results show a significant reduction (p=0.001) for the 5 Hz protocol for the contralateral quadriceps and no difference for the ipsilateral side (p=0.025). For the 1hz protocol there was no change in the CMCT (p=0.016 and p=0.025). On the Ashworth scale, no clinical change in spasticity was observed for both limbs.
Conclusion: One session of the high and low frequency protocols did not change the spasticity evaluated by the Ashworth scale, however, there was a decrease in latency time and CMCT for the contralateral side to the stimulus.

USE OF QUANTITATIVE ELECTROENCEPHALOGRAPHY AS AN ADJUNCT IN THE TEACHING OF FUNCTIONAL NEUROANATOMY TO PHYSIOTHERAPY STUDENTS

Adriana Cavalcanti de Macedo Matos[1], *Francisco Valmor Macedo Cunha*[1]
[1]Centro Universitário Uninovafapi- Afya Educacional/ PI.

Objective: To report the experience of using quantitative electroencephalography as an adjunct in teaching functional neuroanatomy to physiotherapy students.
Methods: This is an experience report about using quantitative electroencephalography as an adjuvant resource in teaching the Functional Neuroanatomy subject for the Physiotherapy course at Centro Universitário UNINOVAFAPI. The classes were taught between August 03 and October 01, 2022, and had a mixed character, with 50 minutes of theoretical exposition in the classroom by expository methodology using slide presentation and 100 minutes

of practical class in sequence using exposition of anatomical pieces and demonstration practical application of quantitative electroencephalography in a volunteer student ex-plaining the anatomical structure covered during the theoretical exposition. For this purpose, equipment using the TQ& Brain-trainer system was used. The evaluation of the use of the work methodology was qualitative, based on the collection of student testimonials as well as the perception of the applicator teacher about the students' engagement.
Results: There was a more effective participation of academics with understanding of the anatomical regions to the functionality of brain activities.
Discussion: Based on the teaching methodology of Functional Neuroanatomy applied in this experience report, it is possible to observe greater engagement of students during the performance of practices as well as greater understanding when correlating structure and function. There is a need for more elaborate studies with the application of knowledge assessment as well as a larger sample and greater standardization of parameters in the classroom in order to confirm the trends observed in this experience report.

EFFECTS OF TRANSCRANIAL DIRECT CURRENT STIMULATION (tDCS) IN PATIENTS WITH BELL'S PALSY: A CASE STUDY

Adriana Cavalcanti de Macedo Matos [1], *Camila Batista da Silva* [1], *Iara Ferreira dos Santos* [1]
[1] Centro Universitário Uninovafapi/ PI.
Objective: To verify the effects of transcranial direct current stimulation (tDCS) associated with kinesiotherapy: myofascial release and facial mimics in a patient with Bell's Palsy, analyze the degree of facial palsy using the House-Brackmann scale and grade synkinesis using the scale of Synkinesis.
Methods: The present work is a case study, based on the individual analysis of a patient with a previous diagnosis of Peripheral Facial Palsy. The service was based on 30 minutes daily of kinetic exercises, with 15 minutes for fascia release and 15 minutes for facial mimicry, on both sides. Fifteen consecutive interventions were performed at 2-day intervals, every five sessions. The scales were applied again on the 10th and 15th day to reassess the results. There was a significant decrease in the level of paralysis, going from grade III to grade II, while synkinesis remained stable at grade I.
Results: There was a significant decrease in the level of paralysis, going from grade III to grade II, while synkinesis remained stable at grade I.
Conclusion: It is concluded that the performance of electrostimulation in a patient with PFP obtained relevant results, showing an improvement in the degree of Facial Paralysis and in the control of synkinesis in certain movements performed, when applying the comparison scales after the execution of tDCS and kinesio-therapy. Thus, further in-depth studies on the use of neuromodulation are suggested as it proves to be effective in clinical sequelae.