demonstrating remission rates up to 30%, but aTMS had remission rates up to 90.5%. aTMS can also be used for suicidality, patients with severe or refractory depression, as well as those with comorbid anxiety, which have historically shown lower rates of success with other treatments. Overall, all forms of TMS produce minimal and temporary side effects with patients being able to return to normal activities the same day as treatment, although aTMS may cause side effects of greater intensity resulting in sleep dysregulation. Cost remains a barrier, with many insurances covering rTMS but not iTBS or aTMS.
Conclusion. TMS is an evidence based, efficacious, and safe treatment for depression. Most FDA-approved TMS protocols for depression have similar number of sessions, duration of treatment, common side effects, and remission rates, besides aTMS, which has dramatically greater remission rates and shorter treatment duration, making it a potentially rapid and effective treatment modality for acute and more severe cases of depression.
Funding. No Funding

Repetitive Transcranial Magnetic Stimulation (rTMS) versus Transcranial Direct Current Stimulation (tDCS) for Depression: a review

Paula Gomes, MD, Ayyub Imtiaz, MD, Menachem Groden, MD and Muhammad Zaidi, MD

Saint Elizabeths Hospital - Department of Behavioral Health, Washington, DC

Introduction. The World Health Organization estimates depression affects 5% of the adult population and is the leading cause of disability and the 3rd cause of disease burden worldwide. Despite progress in therapies and pharmacology, 30% of patients have refractory symptoms. Patients with partial response and patients who do not want or are intolerant to medication can benefit from alternative treatment modalities such as repetitive transcranial magnetic stimulation (rTMS) and transcranial direct current stimulation (tDCS). However, there is scant literature comparing these two neuromodulatory techniques. The authors provide an overview of rTMS and tDCS to guide clinicians.
Methods. A review of MEDLINE, Google Scholar, and EBSCOHost databases was conducted. Keywords used included "rTMS," "tDCS," and "depression." All types of articles discussing or comparing the modalities were selected. The unique characteristics, indications, and side effects of rTMS and tDCS were included.
Results. rTMS is a neurostimulator used in-clinic that induces depolarization and neuronal activity in the dorsolateral prefrontal cortex, where hypofunction has historically been associated with depressive symptoms. The treatment is Food and Drug Administration (FDA) approved, and the most common protocol consists of 36 sessions over 8-9 weeks. Side effects are mild and temporary, and patients can resume daily activities after sessions. Its absolute contraindications are limited to metallic objects or implanted stimulator devices in or near the head. The total cost varies from $6,000-$11,000 but is covered by most insurance.

In contrast, tDCS is a cost-effective, small, and portable neuromodulator self-administered by patients at home that either increases or decreases intrinsic neural firing in the primary motor cortex and dorsolateral prefrontal cortex. Multi-session tDCS is thought to promote or regulate information processing efficiency. The most common protocol uses a constant low current for 20-30 minutes applied daily for 10 to 15 days. Common side effects are mild and temporary, and there is no absolute contraindication. Some meta-analyses have found its efficacy comparable to rTMS or antidepressants. However, due to uncertainties about the specific mode of administration, number of treatments, and duration of effect, its status remains investigational by the FDA.
Conclusions. The efficacy and safety of rTMS for the treatment of depression have been demonstrated in numerous studies. However, the lack of adequately equipped clinics and large cost limits its availability in spite of FDA approval. In contrast, tDCS has some advantages, including safety, tolerability, ease of administration at home, and cost-effectiveness, but requires further research and more rigorous evidence.
Funding. No Funding

Impact of Progressive Muscle Relaxation on Psychological Symptoms on an Inpatient Psychiatric Unit

Penelope C. Farris, BS[1], Sean T. Lynch, MD[1,2], Emily Groenendaal, MD[1,3], Lidia Klepacz, MD[1,3], Bambina Meyers, LCSW[3] and Stephen J. Ferrando, MD[1,3]

[1]New York Medical College, Department of Psychiatry and Behavioral Sciences, Valhalla, NY; [2]Icahn School of Medicine at Mount Sinai, Mount Sinai Beth Israel, Department of Psychiatry, New York, NY and [3]Westchester Medical Center Health Network, Department of Psychiatry, Valhalla, NY

Objectives. To examine the effectiveness of short-term progressive muscle relaxation therapy in reducing symptoms of depression, anxiety, and aggression/agitation, in patients on an inpatient psychiatric unit. Additionally, to determine the impact of clinical and sociodemographic factors on its effectiveness.
Methods. Psychiatric inpatients at a private, community-based psychiatric hospital were invited to participate in a progressive muscle relaxation activity and filled out pre- and post-activity surveys querying symptoms of depression, anxiety, and aggression/agitation, using a created Likert scale.
Results. The 57 participants in this study showed an average decrease in every symptom domain, including -0.93 in agitation/aggressive symptoms ($p<0.001$), -2.14 in depressive symptoms ($p<0.001$), and -1.81 in anxiety symptoms ($p<0.001$). While diagnosis did not appear to be significantly related to change in score, patients with different primary diagnoses had changes in different symptom domains, with patients with Bipolar Disorder

https://doi.org/10.1017/S1092852924001780 Published online by Cambridge University Press

having statistically significant changes in aggression (-1.57, p=0.012) and depression (-2.36, p<0.001), but not in anxiety. Patients with Depression had significant changes in depression (-2.08, p<0.001) and anxiety (-1.96, p<0.001) but not in aggression/agitation, while patients with a Schizophrenia spectrum illness had changes in depression alone (-2.33, p=0.008). Sociodemographic variables had no significant impact.
Conclusions. The findings in this study indicate that a short-term progressive muscle relaxation intervention can lead to statistically and clinically significant changes across various symptom domains and in patients with a variety of psychiatric diagnoses, and support the implementation of this non-invasive and budget-friendly exercise.
Funding. No Funding

Pooled Analysis of EPS-Like Symptoms in the EMERGENT Program of KarXT in Schizophrenia

Peter J. Weiden, MD[1], Keisha Novak, PhD[2], Carolyn Watson, PhD[2], Colin Sauder, PhD[2], Inder Kaul, MD, MPH[2], Andrew C. Miller, PhD[2], Amy Claxton, PhD[2], Steven M. Paul, MD[2] and Stephen K. Brannan, MD[2]

[1]Renaissance School of Medicine at Stony Brook University, Stony Brook, NY and [2]Karuna Therapeutics, Boston, MA

Introduction. Although atypical antipsychotics have lowered the prevalence and severity of extrapyramidal symptoms (EPS), they still contribute to the overall side-effect burden of approved antipsychotics. Drugs with novel mechanisms without D_2 dopamine receptor blocking activity have shown promise in treating schizophrenia without the side effects of currently available treatments. KarXT (xanomeline–trospium chloride) represents a possible alternative that targets muscarinic receptors. KarXT demonstrated efficacy compared with placebo in 3 out of 3 short-term acute studies and has not been associated with many of the side effects of D_2 dopamine receptor antagonists. Here, we further characterize EPS rates with KarXT in these trials.
Methods. EMERGENT-1 (NCT03697252), EMERGENT-2 (NCT04659161), and EMERGENT-3 (NCT04738123) were 5-week, randomized, double-blind, placebo-controlled, inpatient trials in people with schizophrenia experiencing acute psychosis. Data from the safety populations, defined as all participants who received ³1 dose of trial medication, were pooled. For this analysis, we used a broader definition of EPS-related adverse events (AEs) to encompass any new onset of dystonia, dyskinesia, akathisia, or extrapyramidal disorder reported any time after the first dose of medication. Additionally, EPS were assessed by examining change from baseline to week 5 on the Simpson-Angus Scale (SAS), Barnes Akathisia Rating Scale (BARS), and Abnormal Involuntary Movement Scale (AIMS).
Results. A total of 683 participants (KarXT, n=340; placebo, n=343) were included in the analyses. The rate of treatment-emergent AEs (TEAEs) associated with EPS was 3.2% in the KarXT group vs 0.9% in the placebo group. The most commonly reported TEAE was akathisia (KarXT, 2.4%; placebo 0.9%); half of possible akathisia cases in the KarXT group (4/8 TEAEs) were from a single US site, considered by the investigator to be unrelated to trial drug, and resolved without treatment. Overall rates of akathisia TEAEs deemed related to trial drug were low (KarXT, 0.6%; placebo 0.3%). Dystonia, dyskinesia, and extrapyramidal disorder TEAEs were reported by only a single subject each (0.3%) in the KarXT arm. All reported TEAEs were mild to moderate in severity. KarXT was associated with no clinically meaningful mean±SD changes from baseline to week 5 on the SAS (-0.1 ±0.6), BARS (-0.1±0.9), or AIMS (0.0±0.7).
Conclusions. The incidence of EPS-related TEAEs with KarXT was low in comparison to those observed in similar trials of antipsychotics (D_2 dopamine receptor antagonists), although head-to-head studies have not been completed. Moreover, KarXT was not associated with increased scores on EPS scales (SAS, BARS, AIMS) across 5 weeks of treatment. These results, combined with the robust efficacy of KarXT in trials to date, suggest that KarXT's novel mechanism of action may provide therapeutic benefit in the absence of EPS frequently associated with currently available antipsychotics.
Funding. Karuna Therapeutics

Assessment of Underdiagnosis of Tardive Dyskinesia by Geographic Region, Social Determinants, and Other Patient Characteristics

Pooja Gandhi, PharmD[1], Su Zhang, PhD[2], Ayush Patel, PhD[3] and Rajeev Ayyagari, PhD[2]

[1]Teva Branded Pharmaceutical Products R&D, Inc., North America Medical Affairs, Parsippany, NJ; [2]Analysis Group, Inc., Boston, MA and [3]Teva Branded Pharmaceutical Products R&D, Inc., Global Health Economics and Outcomes Research, Parsippany, NJ

Introduction. Tardive dyskinesia (TD) is a hyperkinetic movement disorder associated with antipsychotics (APs).
Objective. To estimate TD diagnosis rates across geographic regions of the United States (US) among adults who use APs.
Methods. In this retrospective cohort study, patients with ≥1 AP claim (≥30-day supply) followed by TD diagnosis (index date) aged ≥18 years at index date with ≥12 months of continuous insurance eligibility after index date and geographic location information were identified in the IBM MarketScan© commercial insurance database (2012– 2019). Additional information was collected from the US census, the Internal Revenue Service, and the Centers for Medicare & Medicaid Services. . Observed TD diagnosis rates were estimated by metropolitan statistical area (MSA; ie, a major city and surrounding geographic areas linked by socioeconomic factors with ≥50,000 individuals). A weighted multivariable linear regression model was used to calculate

https://doi.org/10.1017/S1092852924001780 Published online by Cambridge University Press