Transcranial Magnetic Stimulation in the Treatment of Substance Use Disorders: Discussant: Kathleen Brady, MD, PhD

VP Research

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Colleen Hanlon

Excellent overview of TMS

Basic principles
Improvements in stimulus localization
Improvements in target engagement
Improvements in technical aspects
Cue provocation to improve efficacy
Gradual titration of dosage to improve tolerability



Preliminary data in cocaine, smokers, heavy alcohol consumption

Promising data from Hanlon lab: MPFC, Sham-controlled, accelerated theta-burst stimulation - 10 days of treatment in AUD, improved drinking outcomes at 1, 2 and 3 months



Cornejo – Methamphetamine Use Disorder

Dangerous substance

Use is on the rise – no biologic treatments with efficacy

Initial small studies demonstrated ability to manipulate craving with rTMS

Several studies, high frequency, DLPFC - decrease craving, improve withdrawal symptoms (varying effect size, methodologic differences)

? Improve cognitive function



Sheffer: rTMS in Tobacco Use Disorder

Review:

2 dozen studies Mostly positive, mixed Methodologic inconsistencies

Data from well-controlled study with use outcomes promising

Dosing study in progress

Questions combination therapy





BrainsWay: Positive Data from Smoking Cessation Multicenter Study Evaluating Use of Deep TMS at Society for Research on Nicotine & Tobacco 2020

Randomized, double-blind multi-center trial 262 subjects, sham-controlled 3-weeks daily treatment, 3 weeks follow-up Primary outcome, 4-week Continuous Quit Rate (CQR)

28.4% treatment group vs 11.7% sham



TMS in Depression - Approved in 2008

Still questions:

- ? Where to stimulate
- ? Accelerated treatment multiple treatments in 1 day, more rapid response
- ? Brain state at time of procedure
- ? Refining frequencies and patterns Theta burst
- ? Durability, maintenance



https://static.pexels.com/photos/568027/pexels-photo-568027jpe



All good science leads to more questions: Currently approximately 175 TMS in SUD articles since 2000

Dose





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?Maintenance treatments

Adjunctive therapies



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ONWARD AND UPWARD

Very promising therapy

MUCH progress made in last 20 years

Need:

Sham controlled, adequate sample size Dose–comparison studies Durability studies Ancillary/concommitant treatment



