Transcranial Magnetic Stimulation Efficacy for Smoking Cessation

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Abstract

Smoking is considered the leading cause of preventable death and chronic disease worldwide. Despite signiýcant funding towards understanding the neurobiology of addiction and options for smoking cessation treatment, tobacco kills more than 8 million people each year. Extensive research and neuroimaging studies have helped identify the pathway and mechanisms of dependency, craving, and withdrawal, which allows for targeted treatment options. Current guidelines recommend a combination of pharmacological treatment with behavioural counselling for optimal success. However, research continues for innovative interventions. One option being pioneered for addiction treatment is use of transcranial magnetic stimulation (TMS) therapy. When targeting appropriate brain structures, TMS has been shown to neuromodulate the brain pathway associated with addiction. This review of recent literature and studies assesses the ability of TMS to reduce cravings, cigarette consumption, and abstinence.

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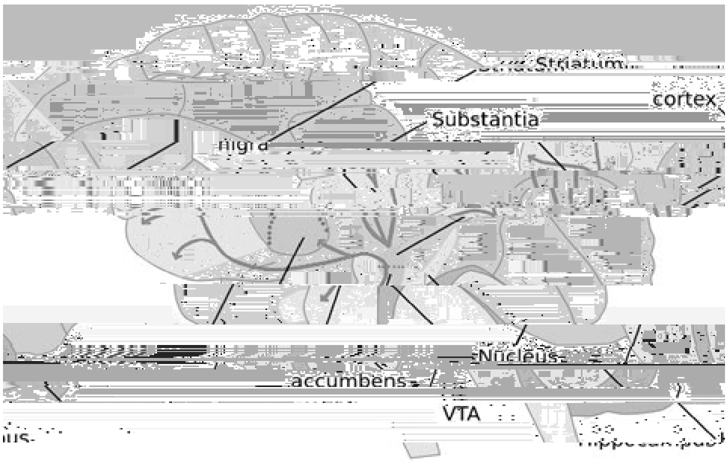

Figure 1: The brain reward center pathway.

Source: Brain rewards pathway. The Bryant Lab Addiction Genetics. Botson University

Figure 2: TMS coil.

Source: Principles of Transcranial Magnetic Stimulation (TMS) where the coil and its magnetic ýeld induces current in the brain.

- a a a a a a B a a .

A 14 a z MRI a a a 10 MS a 16 . Pa a z - 20 Hz MS DLPFC a a a (SMFC) 10 a (10) a a - 25 a a a (F25). O 10 a a , 9 a a a F25, a a (CO) a - . a a , M a N a a S a (MN S) a a a a , 10 a F25; a a a 10 a F25 a a , a a 10 a F25. A a , MRI a a a a 10 a a a (CBF) a a a a (BAI) a a a CBF a BAI 17,18 . H , a a a a CBF a a a a a , a a , a

a a , a a , a a (ACC), a a , a a BAI a a, a a a ACC. a a a a -, a , a a a a a a a a a a a MS a a a .

I a a , a (=10) MRI a a a MS a a a a MS a 19 . A MS a , a , a a a a a a a a , a a DLPFC a a a (OFC); a a a a a 20 .

I a a z - 29 a , MS a - a - , a a a 21 . Pa 8 - a a MS a 2 a 8 F F (FF) - a a a

a . Da a a - , - a a 4, 8, a 12 a a . a a a a MS- a a a 45.2 a 33.5 a , 20.5 a 8 a MS. MS a 3 a a 12 a 50% 15.4% a a . a a a a a z .

a a MS a a a 10 Hz , a a a F a a a a a a a a a 13,15,16,21 . O a a a a z a a a a 16 . , a , a a a z a a a a a a a a a a MS 19,21 . N a a a a z .

10.