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FRC Wednesdays at Noon: Addiction Medicine Conference

Non-invasive Brain Stimulation Methods for Treating Addictions:

Moving Beyond Olds and Milner

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1. What is TMS and how is it used?

Answer: TMS stands for Transcranial Magnetic Stimulation. Its a really interesting new technology where we are able to take an electromagnet and put it on the surface of the brain, on your skull and turn it on and off. It creates a strong magnetic field . Electricity gets stopped by your skin and skull whereas magnetic field is just passed unimpeded. So magnetic field go actually into your brain. Because they are so powerful and quick, they actually induce an electrical current in the brain. So TMS is an interesting technology that allows us to noninvasively and in a way awake human beings, get in and tickle the brain and stimulate it. So I call it 'Electrodeless electrical stimulation' meaning that you are actually electrically stimulating the brain but you do not have to have an electrode in the brain, you do not have to do surgery, you do not have to put anything in. It's a very interesting trick, because its so cool you can use to find out how the brain works, to try the influence on how the brain is working or to potentially use it as a treatment for different brain diseases.

2. Can you tell where TMS should not be used for?

Answer: Well you can see, it doesn't work for hair loss [laughs]. Because you are actually producing the magnetic field near the brain and if somebody has some metal filings in their head or they had a brain surgery, you should use it quite cautiously. But other than that you can use TMS in most people without real problems. When you stimulate, a single pulse of TMS will cause your thumb to move and single pulse TMS is pretty safe. If you start firing the TMS pulses in a series, we call that repetitive TMS or R-TMS and if you fire too much for too long and too higher frequency you can actually get parts of the brain and then they start talking to their neighbors and say come join the party what you can do is produce a seizure. And an unintended seizure is the known side effect of stimulating too much for too long. The seizures that have been induced by TMS are pretty infrequent, may be less than 30 and the whole world is experienced .

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They have all been self limited but you do not want to do that so there are some limitations of how and who should use it. So people who have had seizures in the past, who have epilepsy and people with bad strokes might use it more cautiously. So it's a medical procedure that needs to be done with positions around.

3. TMS is great for freezing depression, addiction and for pain. Can you describe the difference between the three and the methods that you use with TMS or how does that work to help with overcoming depression and addiction?

Answer: There's a lot of interest in trying to use this new non invasive, the vocal way of stimulating the brain as a treatment. So far for TMS usually only one indication that has gotten approval of the food and drug administration that's the FDA approval. That's for people with depression who have tried and failed an anti-depression medication. And they will come in and sit in a chair and it will stimulate the prefrontal cortex of the brain, on and off for about 30 minutes, and we do that everyday for about 4 weeks. The studies have shown that about half the people who do that will give emission that is the depression will go away. So its proving to be very effective treatment for depression, for people who have tried and failed anti-depression medications. It doesn't work with everybody unfortunately, that's a part of my research trying to figure out how to make it better. There's research into using it to treat pain, either acute pain, pain after surgery or chronic pain and those studies are quite promising., although they are not FDA approved. There's a lot of interest in using it potentially to treat the addictions, addictions are smoking, alcohol, cocaine and there are lot of very interesting small studies showing that you can push or pull cravings. So you can make somebody crave less a cigarette, transiently. There's one study hinting that you might be able to use it actually help people quit smoking but in that area nothing yet that is FDA approved but there's lot of excitement and interest.

4. Is there anything that you would like people to know, to be aware of, may be with your research ; do you have anything that you would like to share?

Answer: Well, this whole area of brain stimulation for brain diseases is good, it shows the whole avenue of potential therapies that are different than the pill model or the talking or the behavioral therapy model. This is a whole new way of potentially treating illness, that's pretty darn exciting. The other thing is that it shows that the addictions are no different than the Parkinson's disease , epilepsy or stroking. It really reinforces that all the diseases are related to the brain , there's no difference in the stigma between one or the other. Its just where the circuit is and how the disease starts over. In many ways the fact that they are starting to work , these brain stimulation treatments for these classic psychiatric diseases that are less well understood by the public. Its really powerful in terms of destigmatizing, you know these things are all the same and we are coming up tools that span all the brain diseases.

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