

# TMS TRENDS

MARCH 2018

*A publication of the TMS Institute of Pennsylvania – Advanced Neuropsychiatric Solutions*

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## Botulinum Toxin for Depression?

Psychiatry is experiencing a major paradigm shift. No longer is depression a disease only of norepinephrine and other monoamine deficiencies. Today, we are using innovative treatment interventions such as ketamine, magnets, psilocin, anti-inflammatories, and botulinum toxin (Botox).

The most common site injected with Botox for cosmetic treatments is the glabellar region, which is the area directly above and in between the eyebrows (ie, the lower forehead). When expressing fear, anger, sadness, or anguish, these muscles contract, causing the appearance of 2 vertical wrinkles, referred to as the “11s.” The wrinkles also can form the shape of an upside-down “U,” known as the omega sign. Botox prevents contraction of these muscles and therefore prevents the appearance of a furrowed brow. During cosmetic procedures, approximately 20 to 50 units of Botox are spread out over 5 glabellar injection sites.

A similar technique is being used in studies of Botox for depression. Botox for depression is new to the mental health world but, before psychiatrists caught on, dermatologists were aware that Botox could improve quality of life, reduce negative emotions, and increase feelings of well-being.

How might it work? Several theories about the mechanism of action have been proposed: Facial movements influence emotional states. Numerous studies have confirmed this. Dialectical behavioral therapy expert Marsha Linehan recognized the importance of modifying facial expressions (from grimacing to smiling) and posture (from clenched fists to open hands) when feeling distressed, because it is hard to feel “willful” when your “mind is going one way and your body is going another.” Accordingly, for a person who continuously “looks” depressed or distressed, reducing the anguished facial expression using botulinum toxin might diminish the entwined negative emotions.

A more pleasant facial expression improves social interactions, which leads to improvement in self-esteem and mood. Social biologists argue that (1) we

are attracted to those who have more pleasant facial expressions and (2) we steer clear of those who appear angry or depressed (a negative facial expression, such as a growling dog, is perceived as a threat). Therefore, anyone who looks depressed might have less rewarding interpersonal interactions, which can contribute to a poor mood.

Lastly, Botox leads to direct and indirect neurochemical changes in the brain that can reduce depression. Functional MRI studies have shown that after glabellar Botox injections, the amygdala was less responsive to negative stimuli. For example, patients who were treated with Botox and then shown pictures of angry people had an attenuated amygdala response to the photos.

Botulinum toxin for depression is not ready for prime time. The FDA has not approved its use for psychiatric indications, and Medicare and commercial insurance do not reimburse for this procedure as a treatment for depression. Patients who request BTA for depression must be informed that this use is off-label. For now, we recommend psychotherapy or medication management, or both, for most patients with major depression. In addition, until larger studies are done, we recommend that patients who are interested in Botox for depression use it as an add-on to conventional treatment. However, if larger studies replicate the findings of the smaller studies we have described, botulinum toxin could become a novel therapeutic agent in the fight against depression.

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