

## BACKGROUND

Often the joke is told that women who have frequent Botox injections may have to give a verbal clue as to what emotional state they are in, since their facial muscles no longer respond appropriately. The facts concerning Botox treatments were outlined, along with the implications such treatment may have for being able to communicate accurately.

## BOTOX TREATMENT

Botox is the trademarked name for purified botulinum toxin type A. Despite the potent toxic effects of this substance, Botox offers an ability to manage several conditions, including strabismus, vocal-cord dysfunction, facial tics, migraines, and excessive sweating. These conditions all share the common characteristic of hypertonic muscular activity. Secondary side effects were noted in the 1990s, leading to the use of Botox to reduce facial wrinkles, which then lead to Botox becoming a common cosmetic treatment. Compared to a surgical facelift, Botox is faster, less expensive, and less invasive.

Among the side effects of the cosmetic facial use of Botox is the “still face.” The goal is to affect the function of facial muscles that produce wrinkles, but those same muscles convey emotional states. This reduced facial expression can then have a significant impact on the individual's ability to communicate emotions and the ability of others' to interpret the correct emotional messages.

## ANALYSIS

The corrugator muscles under the influence of Botox cannot create a furrowed brow, which makes it difficult for children to understand their mother's emotional state. Watching the mother's face is one way children learn to interpret emotions.

The embodiment cognition theory describes the tendency of individuals to mirror the facial expression of an emotion to help in understanding or empathizing with other people. This is a proprioceptive feedback process. It allows not only the reading of an

emotional state based on physical facial clues but also the mirroring of the appropriate physical clues in our own faces, helping to better understand emotional status.

The problems posed by facial muscle paralysis in communication were evaluated in a recent experiment. The subjects performed various tests to assess their understanding of emotions immediately before and 2 weeks after having a Botox-based aesthetic procedure. Their results were compared to those of a sample of similar subjects who had no treatment. Regardless of whether the results were evaluated based on judgment parameters or reaction times, paralysis had an obvious effect on subtle expression conveyance. It was easy to see a wide smile, but more nuanced, slight activation of the facial muscles to convey emotion was both difficult to mirror and hard to recognize. Thus both the ability to read facial muscle activity and the ability to mirror facial activity play a role in understanding emotional clues to one's status.

### Clinical Significance

Botox is increasingly becoming more popular in culture. Because of the changes it produces in and around the mouth, dentists need to be aware of its use and effects. Botox treatments alter the ability to communicate well and require additional effort to convey one's emotional messages. Thus a technology that seemed to have a discrete impact on a specific organ system proved to subtly influence another aspect of good function. Dentists should help their patients be aware of this situation and guide them in ways to adapt to the changes in communication resulting from the altered muscular state.

Carney KK: This is mommy's angry face. *Calif Dent Assoc J* 47:141-142, 2019

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