

Research Assessment #9

Date: February 18, 2021

Subject: Botulinum toxin (Botox) A for reducing the appearance of facial wrinkles

MLA citation(s):

Satriyasa, Bagus Komang. "Botulinum toxin (Botox) A for reducing the appearance of facial wrinkles: a literature review of clinical use and pharmacological aspect." *Clinical, cosmetic and investigational dermatology* vol. 12 223-228. 10 Apr. 2019, doi:10.2147/CCID.S202919

Assessment:

For this research assessment, I wanted to dive deeper into the Botox injection component in particular because I wanted to learn exactly what Botox does and how it targets certain components of the face in order to reduce the appearance of wrinkles.

Through this article, I learned that the Botox toxin is actually produced by a bacterium known as *Clostridium botulinum*. The toxin itself inhibits the release of acetylcholine when it binds to certain receptors that prevent the neurotransmitter from releasing a signal to the muscles for them to contract. As a result, the toxin results in temporary paralysis of muscles. What was extremely interesting to me was the cell communication and protein receptor aspect that the Botox toxin process entails. I never knew that the substance came from a bacterium but I knew from my past discussions with Dr. Cain that the substance stops certain signals from being received by the muscles. Because of that fact, I knew that the Botox toxin impacts the nervous system signals and allows for the muscles to stop moving in order to limit the appearance of wrinkles. Another positive that I learned about Botox was that the toxin and injection is temporary so it can be reversible. The article never mentioned exactly how it can be reversed, but

the effects are not permanent so should complications arise, the patient can just wait for the complications to diminish. However, I predicted that in order to reduce the effects of Botox, a physician could inject a substance that would break down the Botox toxin similar to hyaluronidase for hyaluronic acid, or they could inject a toxin that would stimulate the release of acetylcholine that the Botox toxin inhibits. With Botox being temporary, I believe that it poses a variety of benefits but it can also be negative in that patients often want a permanent and substantial result that would eliminate their wrinkles indefinitely. Furthermore, when patients see the diminishing effects of the Botox on certain areas of their face, I believe that they are more likely to undergo the treatment again and be caught in an endless cycle of procedures that produce certain temporary effects that constantly need to be retreated. Through these conclusions, I plan on completing another research assessment in the future that addresses these psychological aspects that injectable procedures create.

In the article, the writer also mentioned that Botox injections have minimal side effects. Potential side effects however could include lumping which could be treated by massaging the injection area. After reading this piece of information, I immediately saw the connection between the detail and what Dr. Cain does in the office. In order to minimize the potential for lumping, Dr. Cain presses on the Botox injection sites and smoothes out the substance in order to provide for the best possible result. The article also mentioned that diluting the Botox with saline could also reduce side effects which Dr. Cain has done as well. Dr. Cain also advises his patients to not participate in any activity that would result in extreme pressure on the face area which was also mentioned in the area. Through reading these tidbits, I made sure to include these pieces of information for my hypothetical patient simulation in the development of my final product.

Overall, this article allowed me to gain further insight into the specifics of the Botox injection and to learn the basics before applying them to my final product. Through annotating this article, I was able to learn more about how to accurately emulate a Botox procedure and create an effective and accurate final product.