Comparison between the Onabotulinum Toxin and the Abobotulinum Toxin in the Treatment of Facial Wrinkles Using Different Dosing Ratios: A Split-Face Study

Thesis

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بسم الله الرحمن الرحيم
قَالُواْ سُبْحَانَكَ لاَ عِلْمَ لَنَا إِلاَّ مَا
عَلَّمْتَنَا إِنَّكَ أَنتَ الْعَلِيمُ الْحَكِيمُ
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List of Abbreviations

ABO : Abobotulinum

BTX : Botulinum toxin

CGRP : Calcitonin gene-related peptide

GAGs : Glycosaminoglycans

ONA : Onabotulinum

SVP2 : Synaptic Vesicle Protein-2

TCA : Trichloroacetic acid

VAMP : Vesicle associated membrane proteins

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Introduction

A large body of research has documented that, in our society, physical appearance has a significant impact on how individuals are perceived by others, and also that it is intrinsically linked to body image, self-esteem and confidence. Thus, it was concluded that an attractive physical appearance can be expected to result in an improved psychological well-being and an improved social functioning ***(Finn et al., 2003)***. This explains why, throughout history and across virtually all cultures, individuals have always desired and sought to improve and enhance their physical appearance ***(Dessy et al., 2011)***.

The face is the central focus of the perception of beauty and attractiveness. Thus, it is the facial appearance that represents the corner stone of the world wide aesthetic concern ***(Finn et al., 2003)***.

When the effects of aging on the face are addressed, the main topic of the discussion is always the wrinkles ***(Zimbler et al., 2001)***. In addition, facial wrinkles can send an emotional miscues and hence cause a negative impact on the individual's both societal impressions and self-esteem ***(Finn et al., 2003)***. Nowadays, medical advances have provided an increasing number of surgical and minimally invasive treatment options available to smooth these lines ***(Fagien, 1999)***.

One of the most important modalities available for smoothening of the facial wrinkles is the botulinum toxins injection. Botulinum toxins represent the foundation of the minimally invasive aesthetic facial treatments. It began with the use of botulinum toxin to smooth the glabellar frown lines and then expanded to include other facial areas such as the forehead horizontal lines and the crow's feet wrinkles ***(Carruthers et al., 2007)***.

There are eight serotypes of the toxin. The two most common commercial preparations authorized for cosmetic use worldwide are the Onabotulinumtoxin A, approved by the US FDA in 2002 and commercially known as Botox, and the Abobotulinumtoxin A, approved by the US FDA in 2009 and commercially known as Dysport ***(Hexsel et al., 2012)***.

Botulinum toxin A is a zinc-dependant endopeptidase composed of a light (50kDa) and a heavy (100 kDa) chains linked by disulfide bond ***(Aoki, 2005)***. Onabotulinumtoxin A and Abobotulinumtoxin A differ in the carrier protein attached to the 150-kDa botulinum toxin A molecule. Although Onabotulinumtoxin A contains a 900-kDa carrier protein attached to the toxin, a 750-kDa carrier exists in Abobotulinumtoxin A ***(Lowe et al., 2006)***.

Few studies were found to compare the characteristics of these two formulations of botulinum toxin A regarding their equivalent doses ***(Lowe et al., 2010)***, with no previous comparison of 3.0: 1.0 U and 2.5: 1.0 U dosing ratio of Abobotulinum toxin A: Onabotulinum toxin A in treatment of facial wrinkles.