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Botulinum Toxin Self-Injection on YouTube: A Word of Caution

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Abstract

Objective: YouTube has become a prominent source of health information for many. The distribution of videos described as "Do-it Yourself" (DIY), "Did it Myself" (DIM) of botulinum toxin are increasingly being uploaded. We analyzed the promotion of DIY and DIM procedures of botulinum injection on YouTube.

Methods: YouTube DE was searched in February 2021. Search terms were "Botox" and "do it yourself" or "did it myself". The search was limited to the English language and non-MD presenters. Each video was analyzed for quantitative aspects and content quality.

Results: A total of 32 videos were analyzed with a median of 5,007 views. The median length (excluding videos <1 min) was 15:09 min. The median number of comments was 74. A disclaimer was given in 78%, complications were mentioned in 47%, management of possible complications was not addressed, and danger zones were noted in 25%. Two thirds of YouTubers included Promotion codes.

Conclusion: The format of self administration of botulinum toxin lacks reliable data, and critical oversight. Communicated quality criteria information is at best suboptimal. With ever more health information presented on social media platforms a professional watchful attitude is both judicious and necessary by medical organizations and/or the health systems.

Keywords: Botox; Botulinum toxin; DIY; DIM; Face; YouTube

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Introduction

The statistics report of the American Society of Plastic Surgeons in 2020 identified botulinum toxin injections as the top minimal cosmetic procedure performed by certified surgeons, accounting for 4,401,536 procedures in the U.S. alone [1]. This represents a 459% increase as compared to 2000. Botulinum toxin injection is now considered the most commonly performed minimal invasive cosmetic surgical procedure, demographically females account for over 7 million procedures. The procedure is most frequently performed in the 40 to 54 year age grouping. In the U.S. this procedure is performed by certified licensed practitioners, generally physicians and dentists (within their scope of practice). Some jurisdictions allow trained and qualified health care professionals such as nurses and physicians assistants to inject botulinum toxin after meeting specific requirements and supervision.

General information regarding FDA approved cosmetic forms of botulinum toxin tailored to both the professional as well as the general public is easily ascertained on professional society web sites such as those of the American Society of Plastic Surgery (ASPS) and The Aesthetic Society and the American Academy of Dermatology Association (AAD). Therapeutic applications, approved treatment areas, procedural steps, risk and benefits and other pertinent topics are generally well defined and communicated.

In recent years a wide variety of internet-based health information has gained ever increasing popularity with social media has become a principle source of medical information for many [2-6].

Significant concerns have arisen on the public health implications of online promotion and distribution of videos described as "Do-it Yourself" (DIY), "Did it Myself" (DIM) and self administration of botulinum toxin [7,8]. It is postulated that this highly engaging cosmetic topic on

formats such as YouTube may influence great numbers of followers. As in all medical and cosmetic procedures, risks and benefits, indications and contraindications must be considered, planned for and judiciously weighted. Recognizing these attributes as well as the potential for severe harms which have been attributed to botulinum toxins, we analyzed and describe the promotion of DIY and DIM procedure on YouTube.

Material and Methods

YouTube DE was searched in February 2021 and finally accessed for viewers interaction on April 23rd, 2021 by two of the authors (IR, OR). Search terms were "Botox" and "do it yourself" or "did it myself". The search was limited to the English language and non-MD presenters. Exclusion criteria were: videos of less than a minute, regions other than glabella, forehead region, and periocular region, patient testimony (injection done by MD). No ethical committee approval was obtained as this study was performed on publicly available Internet data. No personal user account was created for this search. This search strategy resulted in 32 videos for analysis.

Each video was analyzed for the following parameters: (1) Number of views, (2) Duration in minutes, (3) Number of "likes" and "dislikes" (4) Days since upload, (5) Number of comments, (6). Interaction of viewers was calculated according to previously published indices [9]: interaction index (Number of likes and dislikes/total number of views *100%) and viewing rate (number of views divided by number of days since upload *100%). We also calculated an extended interaction index (Sum of number of likes, dislikes and comments/ total number of views *100%). In many videos only the month and year of submission are provided, as such we calculated and denoted the date of upload as the first of the month for all videos. The video content was evaluated for (1) mode of action (s) given, (2) indication (s) given, (3) contraindication (s) given (4) disclaimer, (5) description of pre-injection preparation (6) danger zones (7) post treatment care, (8) management of complications and (9) commercial promo code.

Results

Descriptive analysis of the 32 videos is shown in Table 1. The total number of views was 764,316 with a median of 5,007 views per video. The median length of videos (excluding videos <1 min) was 15:09 min. The median number of likes was 180 and the median number of dislikes was 5. The median number of comments was 74.

Analyzing the quality of information provided in the videos yielded the following results. A disclaimer was given in 78% of the videos (n=25), preoperative preparation such as disinfection was shown in 84% (n=27), complications were mentioned in 47% (n=15), management of possible complications such as higher than approved dosing or concentration was not addressed (n=0), post treatment care measures such as cooling was mentioned in 25% (n=8), a promotion code was given in 63% (n=20), mode of action of neurotoxins was stated in 31% (n= 10). Danger zones were given in 25% (n=8). Indications such glabella lines (n=23), crow's feet (n=24) and forehead wrinkles (n= 27) were mentioned; additional other areas were mentioned in 20 videos. The interaction index was 2.91% (extended 3.46%) and the median viewing rate was calculated as 1,960 % (range18% to 78,004%). Two thirds of YouTubers (n=20) included Promotion codes in their videos or info box.

Discussion

Social media has taken on an increasingly influential role in procuring health information [3-6]. This information has traditionally been communicated in a variety of forms, usually developed as professional tutorials by health care providers, health related organizations and the medical industry. Nearly every medical field appears to be represented by or reflected in YouTube video tutorials [9].

With an ever popular and increasing interest in cosmetic surgery and associated procedures as well as the wide acceptance and availability of social media as a perceived and valued source of information we found it to be of particular importance to question and examine both the medico-legal content as well as the accuracy and quality of the videos on botulinum injection [10,11]. In so doing, our analysis focused on DIY or DIM by lay persons therefore excluding professional videos by health care providers and physicians. In the article by Patel on neurotoxin injection the authors reported that only 31% of videos on botulinum toxin were posted by physicians [7]. Analysis of YouTube videos must distinguish between patient education by health care providers and personal experience posted lay persons [12]. Patel et al. [7] found that two thirds of patient educational videos posted by physicians were significantly more reliable and had more educational value but were less popular than personal experience videos. In their analysis of Botox videos, they identify 30 videos on education and a similar amount of personal experience videos. We found a similar number of 32 DIY videos on Botox. The findings reflect how boundaries between 'lay' and professionally produced content are re-drawn or made permeable through social media use, exemplifying Nettleton's [2] concept of 'e-scaped' medicine: 'Medical knowledge is no longer exclusive to the medical school and the medical text; it has 'escaped' into the networks of contemporary infoscapes where it can be accessed, assessed and re-appropriated'. While clinicians should utilize information to help primarily educate patients with standardized and accurate

Table 1: Descriptive data on the YouTube videos on Botulinum toxin self-injection.

Parameters of Videos (n=32)	Median (Range)
Number of views	5,007 (7-485, 966)
Duration (min)	15:09 (3:29-58:32)
Number of likes	180 (0-10, 972)
Number of dislikes	5 (0-410)
Number of comments	74 (0-918)
Viewers' interaction index (%)	2.91
Viewers' extended interaction index (%)	3.46
Number of videos addressing complications (percentage of all videos)	15 (47%)
Number of videos explaining mode of action (percentage of all videos)	10 (31.25%)

information about their treatment, patients will continue to seek educational material online. While by no means dogmatic, it suggests that the nature of and reliance in medical information available on the World Wide Web may lead one to circumvent personal consultation with a physician.

In a recent analysis of Spanish YouTube videos, a similar approach was undertaken analyzing botulinum related content [8]. In their analysis a mean length of videos of 15:03 min was similar to our finding. Average time spent on YouTube per day was measured as 41:09 min [13]. The numbers of followers, likes, dislikes and comments were much higher in the Spanish videos as compared to the English videos analyzed in our review. All published analyses on cosmetic botulinum toxin treatment reported a wide range of likes, dislikes and comments ranging from 0 to several thousand [7,8]. Patel et al. [7] reported that educational videos had less popularity (views per day) as compared to personal experience videos. We identified a viewing index which was significantly lower than reported for personal experience videos with an extended interaction index of 3.46%, higher than a calculated value of 1.8% from Castillo-Abdul et al. [8].

Personal experience videos were reported to be less reliable [7]. In addition, personal experience videos were identified as being of low quality when analyzed by GQS (Global Quality Score) criteria [14]. In accordance with these findings we found that roughly half of the videos did not mention potential complications resembling at best 3 points on the GQS (suboptimal quality and flow, somewhat useful to patients, important topics are missing, some information given). Of particular concern and consistent with our analysis, danger zone were only mentioned in a quarter of the videos and the management of complications was not addressed further reducing both the quality as well as the clinical relevance of these self injecting videos. All too often we found that YouTube videos on self-injection of botulinum toxin contain unreliable, inaccurate and often incomplete information. Wong et al. [15] reported that videos from health professionals had a mean GQS score of 4.4 and were more reliable than videos from independent users. Whether the videos on DIY have led to serious complications with the need for subsequent medical intervention is not reported (PubMed search terms [Botox] and [DIY] and [complications]). A search on complications of hyaluronic acid self-injection revealed only four reported cases as compared to 657,000 hits on Google on DIY hyaluronic acid filler injection [16,17]. While 78% of YouTubers did provide some measure of a disclaimer in describing their background, credentials or experience while emphasizing professional execution of the procedure, in its current form this social media format lacks in both reliable data, as well as critical oversight.

Precedent research has indicated that older adults are less likely to trust online health information [3,4,6] and highlighted barriers to online health information-seeking amongst adults, such as concerted avoidance of self-monitoring, varied information literacy levels and wariness of affecting doctor–patient relationships. In contradistinction, Yonker et al. [5] systematic review of social media use for health purposes amongst adolescents and young adults highlights the multiple of opportunities afforded by social media technologies for communicating information and practice to this younger demographic. With the largest demographic of individuals seeking and undergoing cosmetic botulinum toxin injections, the 40 to 54 age group, and the intention of YouTubers presenting DIY videos must be elucidated.

Of particular concern is the associated practice of including promotion codes in YouTube videos. Our data shows that ⅓ of the videos included such a code for either a financial incentive and/or sourcing additional information. Conflicting ethical and financial considerations complicate both the relationship and the content, likely playing some role as a driving force for creating, uploading and promoting these videos. Promotion codes are currently not restricted on botulinum toxin, and Castillo-Abdul et al. [8] termed these types of videos “commercial tutorials”. These videos certainly resemble other forms of YouTube videos which establish numbers of followers for commercial purposes. In any case, it is imperative to note that procedures with a very real potential to harm are widely being distributed. With global accessibility, a multitude of readily available formats and widening exposure, the presentation of DIY procedures must be considered in light of national regulation on medical intervention. Whether DIY medical procedures should be regulated with respect to educational, medical, health and safety content according to credible, responsible and authoritative (GQS, Health on the net foundation (https://www.hon.ch/en/)) guidelines and criteria must be reasonably considered. Simsek et al. [9] advocate that more informative and reliable content YouTube videos should be uploaded by health professionals. This statement is in line with the findings from Wong et al. [15] on the quality of videos on botulinum toxin posted by health providers. With more health information presented in the internet and social media a professional watchful attitude is necessary by medical organizations or the health system [18].

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