

# Is the duration and effectiveness of cosmetic effects from botulinum toxin decreasing? results from a survey of 400 healthcare professionals

## Abstract

Botulinum toxin is the leading cosmetic procedure in aesthetic medicine. Its duration and magnitude of effects has been proved through time. Nevertheless, in the last two years, non-scientific reports suggested that the duration and the effectiveness of botulinum toxin A (BoNTA) treatment outcomes may be decreasing, regardless BoNTA type. In our paper, we describe the results of a survey of more than 400 healthcare professionals, mostly from Latin America, about the duration of the effects and the effectiveness of treatment with BoNTA in the last two years.

**Keywords:** botulinum toxin A, effectiveness, real-world evidence, healthcare survey

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## Introduction

The cosmetic application of botulinum toxin, initially published by Carruthers,<sup>1</sup> is the most frequently performed cosmetic procedure worldwide,<sup>2</sup> with high standards of satisfaction for both practitioners and patients. Historically, several publications showed an average duration of effect ranging from four to six months.<sup>3</sup> This timeframe was further confirmed by a rigorous meta-analysis conducted by Flynn,<sup>2</sup> encompassing an initial review of 164 articles, with a predominant focus on the glabellar area.<sup>2</sup> This meta-analysis showed a duration of effect ranging from three to five months for female patients and from four to six months for male counterparts.

In addition, Landau et al published high standards of satisfaction among patients who underwent treatments with botulinum toxin A (BoNTA). High rates of patient satisfaction have also been reported with abobotulinumtoxinA (aboBoNT-A) treatment for upper facial aesthetic indications, with results still evident up to six months post-injection in some subjects.<sup>4</sup> Further publications were consistent with these results, showing high rates of satisfaction and significant patient-reported outcomes for BoNTA treatments in several facial areas according to different scales.<sup>5,6</sup> Nevertheless, highly qualified healthcare professionals (HCPs) have reported their recent concern about the effectiveness of BoNTA treatments, in terms of a perceptible decline in the duration of the cosmetic effect that leads to lower rates of patients' satisfaction. In order to address this issue scientifically and accurately, we performed a survey among a large group of highly qualified HCPs who inject BoNTA for aesthetic treatments.

## Methods

An anonymous survey was conducted, directed to HCPs with experience in aesthetic procedures using BoNTA in adult subjects, including physicians and odontologists. Nurses and cosmeticians were excluded. No honoraria were considered for participation.

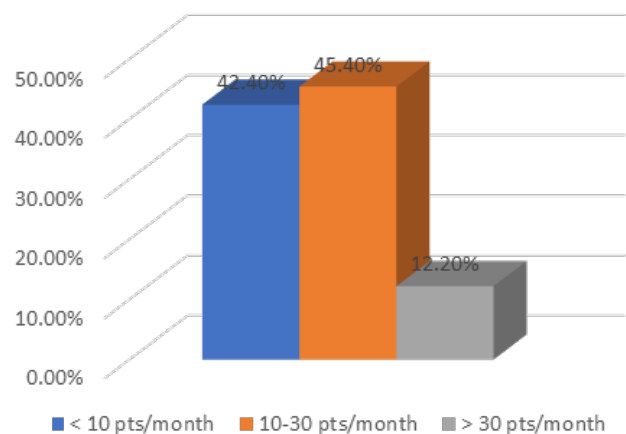
Survey was accessed from July 1<sup>st</sup> to August 31<sup>st</sup> 2023 through Beauty Antiaging and Aesthetic Sessions (BAAS) social networks @BAASORG

Participation was closed once the prespecified sample of 400 participants was reached.

The structured questionnaire was developed ad hoc and aimed to retrieve data about HCP specialty, number of patients treated in a monthly base, subjective perception of decline in the duration and the intensity of the cosmetic effect of BoNTA, the potential influence of the anatomical localization of the procedure, the potential influence of previous BoNTA applications in the decline of duration and intensity of the effect, and the possible strategies to correct such decline. All retrieved data was tabulated in spreadsheets and a descriptive statistical analysis was performed.

## Results

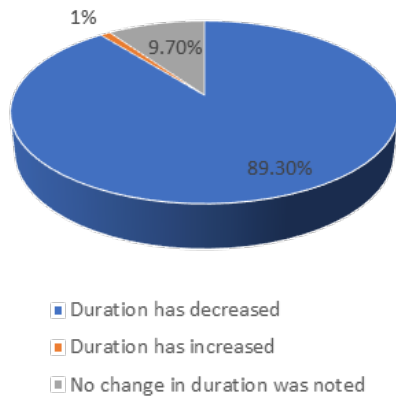
Four hundred and three HCPs participated in the survey; most of them were physicians (87.8%), mainly aesthetic physicians (45.4%) and dermatologists (29.8%). HCPs' experience in treating patients with BoNTA is summarized in Figure 1.



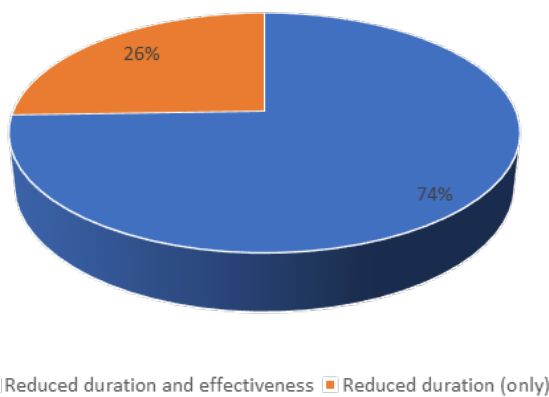
**Figure 1** Proportion of HCPs assisting patients (pts) receiving BoNTA in a monthly base (n = 403).

Most participants (89.3%) considered that the cosmetic BoNTA effect declined during the last two years (Figure 2). When asked about a detailed evaluation of this diminished action, 74.5% of participants reported that both duration and effectiveness were reduced (Figure 3). HCPs were asked about the potential causes of this phenomenon,

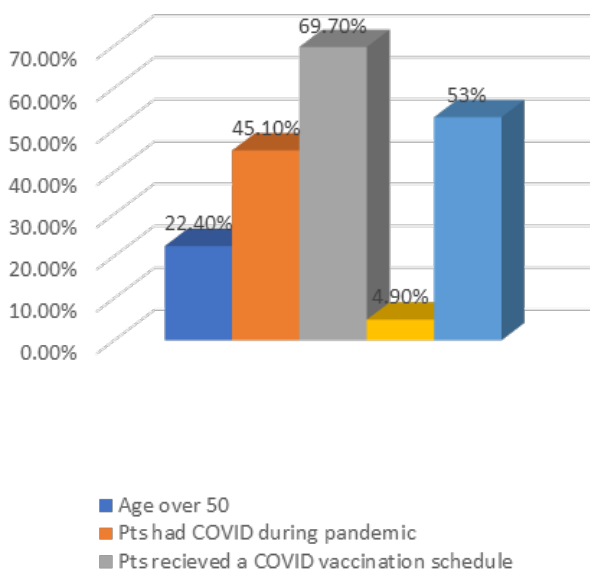
being older age and COVID-19-related the most prevalent reported (Figure 4).



**Figure 2** HCPs perception about duration of BoNTA effect during the last two years (n = 403).

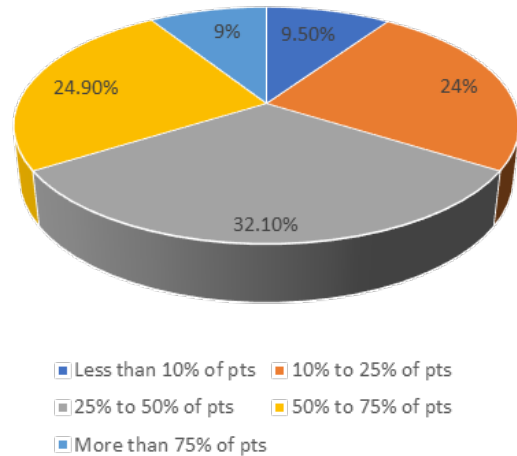


**Figure 3** Detailed evaluation of BoNTA reduced effect during the last two years (n = 392).



**Figure 4** Perceived potential causes of decline BoNTA effect according to subjective HCPs opinion (n = 304). Percentages sum may exceed 100% due to the possibility of multiple answers.

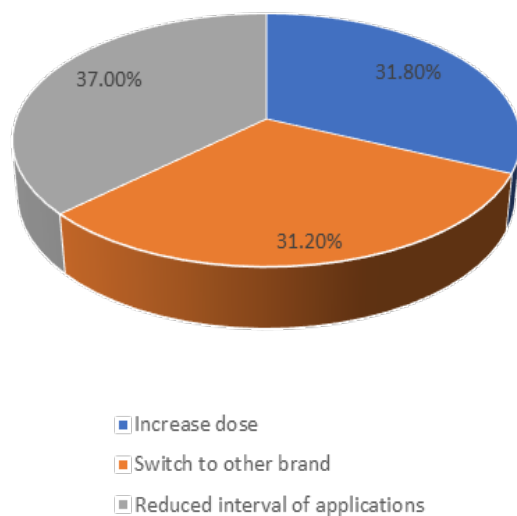
Among a subset of 361 HCPs perceiving this decline of BoNTA duration effects, 47.37% described that this reduced action was generalized in all their patients, while 52.63% noted this decline only in some treated subjects. In the latter subgroup, nearly one third of the surveyed HCPs reported that such reduction was perceived in 25% to 50% of their patients (Figure 5).



**Figure 5** Proportion of patients (pts) in which reduced effect of BoNTA was reported among treating HCPs (n = 192).

The perception of this reduced BoNTA according to the anatomical application site was higher in the glabella (61%), the frontal area (58.8%) and the orbicular zone (45.3%). In addition, the impact of previous applications on the reduction of the effect was retrieved; 81% of patients had received BoNTA between five to ten times before, while in 10.4% of cases this weaning effect was reported in the first application.

Among the proposed strategies to overcome this decline in duration and effectiveness of BoNTA, reducing the interval between applications was the preferred option (37%); complete detail is shown in Figure 6.



**Figure 6** Suggested strategies to overcome the reduced effect of BoNTA treatment (n = 362).

## Discussion

In our survey of more than 400 Latin American HCPs experienced in BoNTA application, a decrease in the duration and effectiveness of this aesthetic treatment was perceived during the past two years. This reduced effect was recognized in several application anatomical sites. Nearly a half of the surveyed HCPs considered that this reduction of the BoNTA effects was seen in all their treated patients. BoNTA injections have gained a high popularity in the field of aesthetics, due to their well-known safety profile and benefits.<sup>7</sup> However, several highly qualified HCPs have suggested that this treatment effectiveness has been declined, especially in terms of duration. In addition, this weaning effectiveness has been identified mostly in experienced patients. Our results seem to confirm these previous subjective reports.

When considering factors that could potentially interfere with the effect of BoNTA, responders considered that both older age and COVID-related factors, including vaccination, may have interfere with treatment outcomes. These age-associated impact is relevant, taking into consideration that patients older than 65 years of age had significantly more cosmetic facial procedures performed than younger subjects.<sup>8</sup> In addition, a deleterious effect of COVID vaccination on effectiveness of BoNTA has been described.<sup>9</sup> This observation deserves further research.

As a suggestion to reverse the reduction of BoNTA effect, a shorter interval between application was the most proposed strategy. It is worth noting that short-interval applications have not been associated with a higher risk of antibody formation;<sup>10</sup> as a consequence, this strategy may be a suitable option to optimize treatment outcomes.

Our study has limitations. First, it was a web-based survey and inclusion biases cannot be excluded. However, previous important evidence in Dermatology has been obtained using this research tool.<sup>11</sup> Secondly, as a cross-sectional study, it is susceptible to bias due to low response and misclassification. Nevertheless, several strengths should be highlighted. First, to our best knowledge, our study represents the largest retrieved sample of highly qualified aesthetic HCPs in Latin America. Secondly, the retrieving of real-world data is important to improve current practice.

## Conclusion

A high proportion of qualified HCPs report a reduction of duration and effect of BoNTA treatment in the past two years in Latin America. Half of the respondents describe that this reduction affects all their patients. According to their experience, age and COVID-related factors may explain these results.

Further research is warranted to define potential risk factors to an early identification of potential effect individuals, in order to proposed a tailored approach.

## Acknowledgments

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## Conflicts of interest

The authors declare no conflict of interest.

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