Fewer injections of botulinum toxin type A for treatment of spasticity are perceived as beneficial by both patients and caregivers

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BACKGROUND

- Botulinum toxin type A (BoNT-A) is a recommended pharmacological option for patients with spasticity,[1] and its anti-spastic effects have been demonstrated in stroke and central nervous system lesions,[2–4] multiple sclerosis (MS)[5] and cerebral palsy.[6,7]
- The clinical effect of BoNT-A typically lasts for 3–4 months; therefore, many patients with spasticity require long-term treatment with repeat injections of BoNT-A at regular intervals (at least 3 months apart).[1]
- The impact of less frequent BoNT-A injections on the daily lives of real-world patients and caregivers has not been studied widely.
- Carenity,[8] an online social media platform for people with chronic conditions, was used to survey patients and caregivers of patients with spasticity who were receiving BoNT-A treatment.

OBJECTIVE

- To understand the impact of fewer BoNT-A injections from patient and caregiver perspectives.

METHODS

Study design

- An online, cross-sectional survey conducted between 10 November 2017 and 28 February 2018 via the Carenity[8] platform.
- Emails were sent to patients and caregivers from France, Germany, Italy, Spain, the UK and the USA inviting them to complete the online questionnaire.

Inclusion criteria

- Eligible participants were aged ≥18 years old and were either patients self-described as having spasticity and who had received BoNT-A treatment for ≥1 year, or caregivers of such patients.
  - Spasticity had to be due to MS, stroke, traumatic brain injury, spinal cord injury, cerebral palsy, brain tumour or spastic paraplegia.

Assessments/analysis

- The questionnaire (presented in the local language) comprised multiple-choice questions, and Likert scale and free-text responses.
- The following domains were assessed: perceived benefits of less frequent BoNT-A injections; number of BoNT-A injections to produce perceived benefits; improvements in quality of life (QoL) resulting from less frequent BoNT-A injections; and feelings about longer intervals between medical visits.
- For caregivers, some questions related to their patient, whereas others related to their experience as a caregiver.

Statistical analyses

- Descriptive analyses are presented.

RESULTS

Participants

- In total, 615 participants were included in the analysis (427 patients and 188 caregivers).
- Baseline characteristics for patients, caregivers and caregivers' patients are presented in **Table 1**.
  - Mean age was 41.7, 38.6 and 57.4 years, respectively, and 48.0%, 55.0% and 55.0%, respectively, were female.
  - Most patients (55%) were receiving onabotulinumtoxinA as their current BoNT-A treatment.
  - Mean time since diagnosis was 8.1 years, compared with a mean time of 3.5 years since first BoNT-A injection.

Table 1. Baseline characteristics of all participants (N=615)

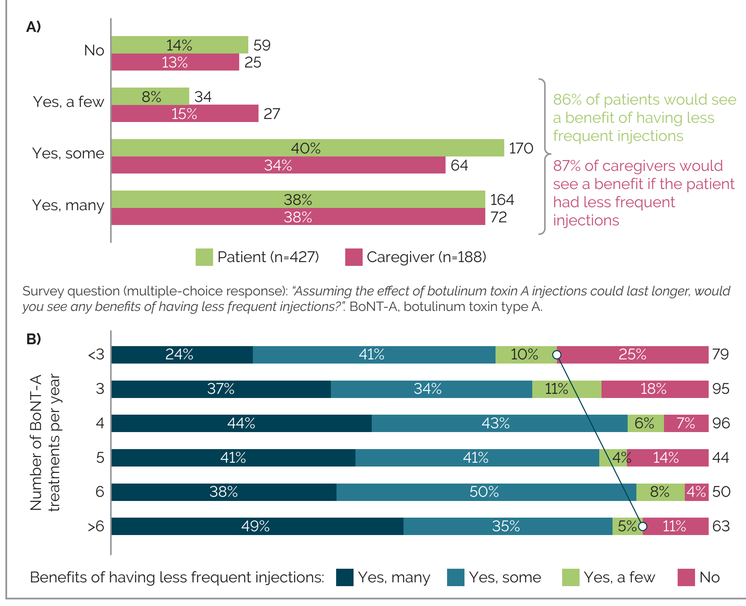
Parameter	Patients (n=427)	Caregivers' patients (n=188)	Caregivers (N=188)
Sex, n (%)			
Male	216 (51)	84 (45)	84 (45)
Female	206 (48)	104 (55)	104 (55)
Transgender	5 (1)	0 (0)	0 (0)
Age, n (%)			
18–30 years	72 (17)	24 (13)	49 (26)
31–40 years	127 (30)	15 (8)	63 (34)
41–50 years	134 (31)	25 (13)	45 (24)
51–60 years	66 (15)	35 (19)	25 (13)
>60 years	28 (7)	89 (47)	6 (3)
Mean (95% CI), years	41.7 (40.6–42.8)	57.4 (54.6–60.1)	38.6 (36.9–40.2)
Duration of caregiving, n (%)			
<1 year	–	–	11 (6)
1–3 years	–	–	64 (34)
3–5 years	–	–	46 (24)
5–10 years	–	–	45 (24)
10–15 years	–	–	6 (3)
>15 years	–	–	16 (9)
Mean (95% CI), years			4.9 (4.1–5.7)
Parameter	**All participants***		
Cause of patient spasticity, n (%)			
Multiple sclerosis	256 (42)		
Stroke	122 (20)		
Spastic paraplegia	61 (10)		
Spinal cord injury	60 (10)		
Cerebral palsy	50 (8)		
Traumatic brain injury	48 (7)		
Brain tumour	18 (3)		
Time since patient diagnosis, n (%)			
<3 years	184 (30)		
3–5 years	103 (17)		
5–10 years	136 (22)		
10–15 years	64 (10)		
>15 years	104 (17)		
Not specified	24 (4)		
Mean (95% CI), years	8.1 (7.4–8.9)		
Date of patient's first BoNT-A injection, n (%)			
<2 years ago	271 (44)		
2–5 years ago	186 (30)		
5–10 years ago	101 (16)		
10–15 years ago	37 (6)		
>15 years ago	20 (3)		
Mean (95% CI), years	3.5 (3.1–3.8)		
BoNT-A treatment received by patient†, n (%)			
OnabotulinumtoxinA	338 (55)		
AbobotulinumtoxinA	109 (18)		
IncobotulinumtoxinA	67 (11)		
Other‡	3 (<1)		
Don't know	98 (16)		

*Participants are patient responders and caregivers answering on behalf of their patients; †self-reported; ‡for respondents from Spain only, brand names given were Bocouture, Lantox, Azzalure. BoNT-A, botulinum toxin type A; CI, confidence interval.

Perceived benefits of less frequent BoNT-A injections

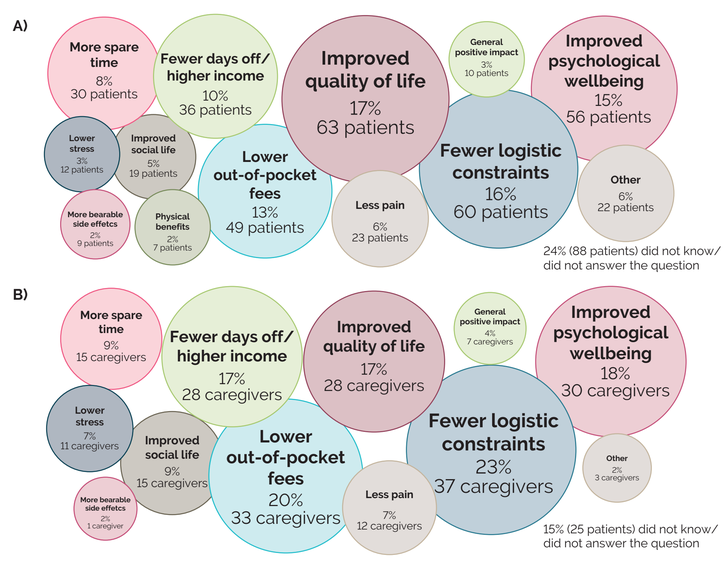
- Assuming longer lasting effects of BoNT-A treatment than at present, 86% of patients and 87% of caregivers felt that fewer injections per year would be beneficial **(Figure 1A)**.
- As shown in **Figure 1B**, patients receiving a greater number of BoNT-A injections per year reported more benefits associated with fewer injections.
- For patients who believed fewer BoNT-A injections would be beneficial, the most frequently cited perceived benefits were **(Figure 2A)**:
  - Improved QoL.
  - Fewer logistical constraints.
  - Improved psychological wellbeing.
- For caregivers, the most common perceived benefits were **(Figure 2B)**:
  - Fewer logistical constraints.
  - Lower out-of-pocket expenses.
  - Improved psychological wellbeing.
- According to patients, the three most important perceived benefits of fewer BoNT-A injections were **(Figure 3A)**:
  - Improved mobility.
  - Longer periods of not worrying about symptoms.
  - More self-confidence.
- For caregivers, the most popular reported benefits were **(Figure 3B)**:
  - Longer periods of not worrying about patients' mobility.
  - More quality time with friends and family.
  - Smaller logistical burden.
- When given a pre-specified list of potential benefits, only 3% of patients (n=14) and 3% of caregivers (n=6) expected to see no benefits.

Figure 1. Benefits of receiving fewer BoNT-A injections per year A) overall, as reported by patients (n=427) and caregivers (n=188), and B) according to number of BoNT-A injections per year (patients only, n=427)



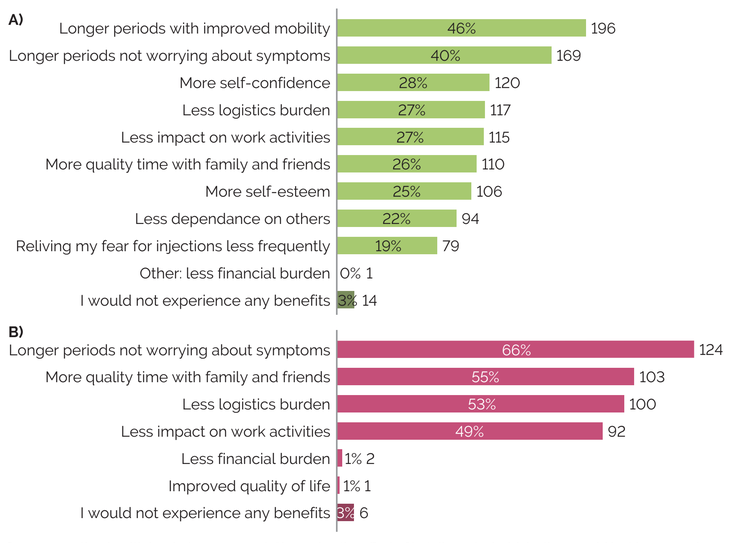
Survey question (multiple-choice response): *"Assuming the effect of botulinum toxin A injections could last longer, would you see any benefits of having less frequent injections?"*. BoNT-A, botulinum toxin type A.

Figure 2. Perceived benefits of receiving fewer BoNT-A injections per year as reported by A) patients (n=368) and B) caregivers (n=163)



Survey question (free-text response): *"Assuming the effect of botulinum toxin A injections could last longer, what would less frequent botulinum toxin A injections mean to you?"*. BoNT-A, botulinum toxin type A.

Figure 3. Most important perceived benefits of receiving fewer BoNT-A injections per year as reported by A) patients (n=427) and B) caregivers (n=188)



Survey question (multiple-choice response): *"Assuming the effect of botulinum toxin A injections could last longer and you/the patient had less frequent injections, what would be the 3 most important benefits for you?"* BoNT-A, botulinum toxin type A.

Expected reduction in number of BoNT-A injections to produce perceived benefits

- Most patients and caregivers felt that 1 or 2 fewer injections per year would be enough to produce their perceived benefits (215/367 [59%] and 61/102 [60%], respectively).
  - 34% of patients and 25% of caregivers reported they would feel benefits from 1 less injection per year.
- Patients receiving the highest numbers of current injections required a larger reduction in injection number to perceive benefits **(Figure 4)**.
- The preferred number of BoNT-A injections was 2 or 3 per year for 62% (228/367) of patients and 72% (73/102) of caregivers.

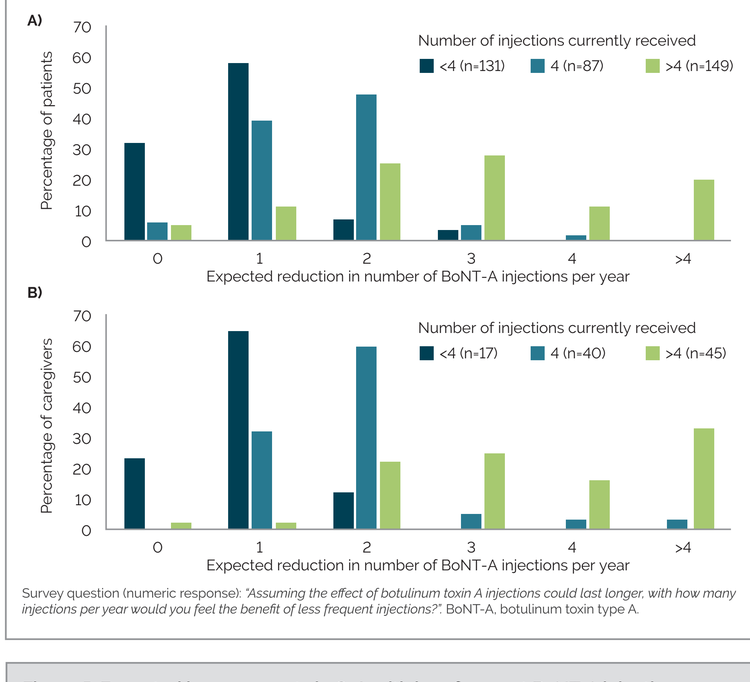
Improvements in QoL with less frequent BoNT-A injections

- At least 79% of patients (338/427) and 91% of caregivers (172/188) reported that fewer BoNT-A injections would improve ≥1 aspect of burden of treatment **(Figure 5)**.
- General impact on QoL ranked highest in both populations, with 92% of patients (391/427) and 98% (184/188) of caregivers reporting that less frequent injections would improve QoL.

Feelings about longer intervals between medical visits

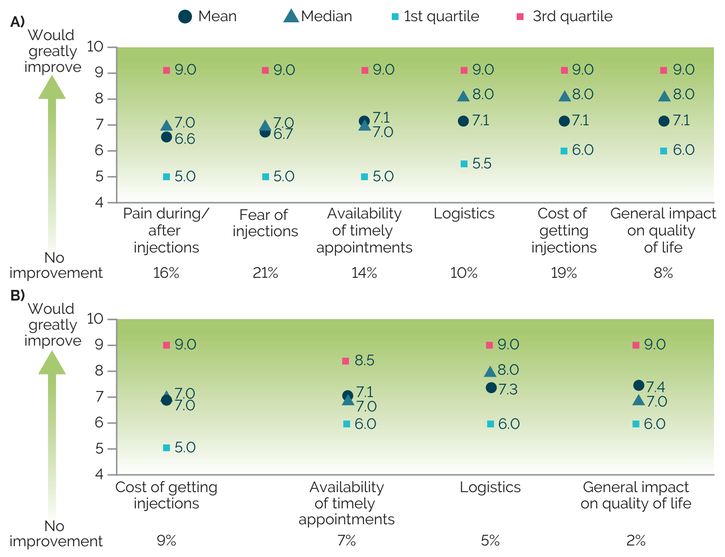
- Two-thirds of patients (281/427; 66%) said they would not mind having less frequent medical visits.
  - 8% (36/427) would not feel comfortable with less frequent medical visits.
  - 14% (59/427) would arrange alternative appointments to see their doctor more frequently.

Figure 4. Expected reduction in number of BoNT-A injections per year to produce perceived benefits, according to number of injections currently received, as reported by A) patients (n=367) and B) caregivers (n=102)



Survey question (numeric response): *"Assuming the effect of botulinum toxin A injections could last longer, with how many injections per year would you feel the benefit of less frequent injections?"*. BoNT-A, botulinum toxin type A.

Figure 5. Expected improvements in QoL with less frequent BoNT-A injections as reported by A) patients (n=427) and B) caregivers (n=188)



Survey question (Likert-scale response): *"Assuming the effect of botulinum toxin A injections could last longer and you had less frequent injections, please assess how it would improve the burden of botulinum toxin A injections"*. Improvement was rated on a scale of 0–10, where 0 was 'no improvement' and 10 was 'it would improve greatly'. Percentages are that of patients and caregivers reporting no improvement. BoNT-A, botulinum toxin type A.

CONCLUSIONS

- Reducing the number of yearly BoNT-A injections, as a result of longer lasting efficacy, would have many beneficial effects on the lives of patients and caregivers, with improvements in patient mobility ranking particularly high.
- For most patients and caregivers, reducing the number of BoNT-A injections by only 1 or 2 per year was expected to be enough to produce these benefits.

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