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INTRODUCTION

- Cervical dystonia (CD) is the most common form of focal dystonia and involves involuntary muscular contraction, resulting in abnormal head and shoulder movements and/or postures¹
- Botulinum toxin (BoNT) is considered the standard of care for treatment of CD^{2,3}
 - Its safety and efficacy were established in controlled clinical trials^{4,5}
 - However, few long-term studies have assessed the impacts of BoNT treatment on quality of life (QOL) and other outcomes in real-world practice
- Thus, an observational, multicenter, prospective registry (CD PROBE) was designed to assess the safety, effectiveness, and utilization patterns of onabotulinumtoxinA as a treatment for CD in clinical practice

OBJECTIVE

- To present the effectiveness and safety results from CD PROBE of onabotulinumtoxinA as a treatment for CD

METHODS

Study design and subjects

- CD PROBE was a multicenter, prospective, observational registry designed to capture real-world practices and outcomes for onabotulinumtoxinA CD treatment in the US
- Subjects diagnosed with CD and identified by the physician as candidates for onabotulinumtoxinA therapy were: new to principal physician's practice, new to BoNT therapy, or if previously participated in a BoNT clinical trial, must not have received BoNT for ≥16 weeks
- Subjects could receive 3 onabotulinumtoxinA treatment sessions
 - Dilution, dosing, and muscles injected with onabotulinumtoxinA were at the full discretion of the treating physician
 - The time to the next treatment session was determined by the physician, so treatment intervals, and thus assessment intervals, were variable
- Effectiveness assessments reported here are Toronto Western Spasmodic Torticollis Rating Scale (TWSTRS), Clinician Global Impression of Change (CGIC), Patient Global Impression of Change (PGIC), and Pain Numeric Rating Scale (PNRS)
- Adverse events (AEs) were assessed throughout the study
- Phone interviews were conducted 4-6 weeks post-injection; study assessments were performed during phone interviews and office visits

Statistical analyses

- Descriptive and inferential statistics, including analysis of variance and analysis of covariance analyses when appropriate, were utilized to evaluate the change in outcome measures over study treatment sessions
- Effectiveness data are reported for subjects who had the first treatment session, reported their prior exposure to BoNT at baseline, and had completed all assessments for a given measure

RESULTS

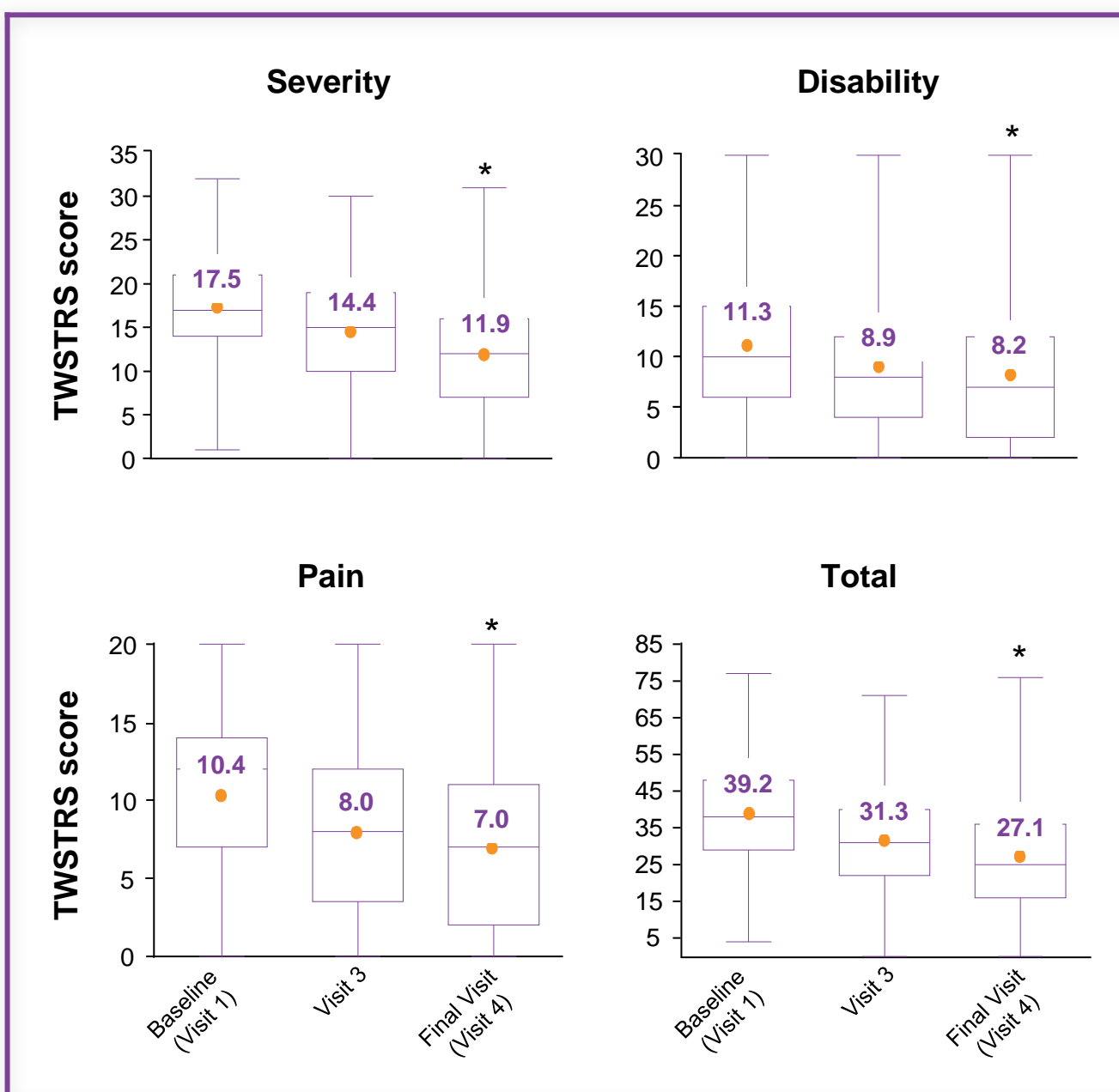
- 1041 subjects (out of 1046 enrolled) comprised the as-treated population
- Baseline characteristics are shown in **Table 1**
- Mean dose was 189.8 ± 87.1U, with an average of 14.6 and 15.1 weeks between treatments
- Highly significant, sustained improvements in all TWSTRS subscale scores and total score were demonstrated with onabotulinumtoxinA over the course of the study (**Figure 1**)

Table 1. Baseline Demographics and Disease Characteristics

Characteristic	N=1041
Age, y	58.0 ± 14.7
Gender, n (%)	
Female	774 (74.4)
Race, n (%)	
White	961 (92.3)
Non-white	80 (7.7)
Body mass index ^a , kg/m ²	26.6 ± 5.4
Predominant Subtype ^b , n (%)	
Anterocollis	59 (5.7)
Laterocollis	404 (38.9)
Retrocollis	55 (5.3)
Torticollis	494 (47.5)
Other	27 (2.6)
Severity ^b , n (%)	
Mild	345 (33.2)
Moderate	548 (52.7)
Severe	146 (14.1)
Age at symptom onset, y	49.0 ± 16.7
Time from CD onset to diagnosis, y	5.0 ± 8.1
Time from diagnosis to treatment, y	1.1 ± 4.5
Prior treatment with botulinum toxin, n (%)	380 (36.5)

Data are presented as mean ± standard deviation unless otherwise indicated. ^aData were not available for 76 subjects. ^bData were not available for 2 subjects.

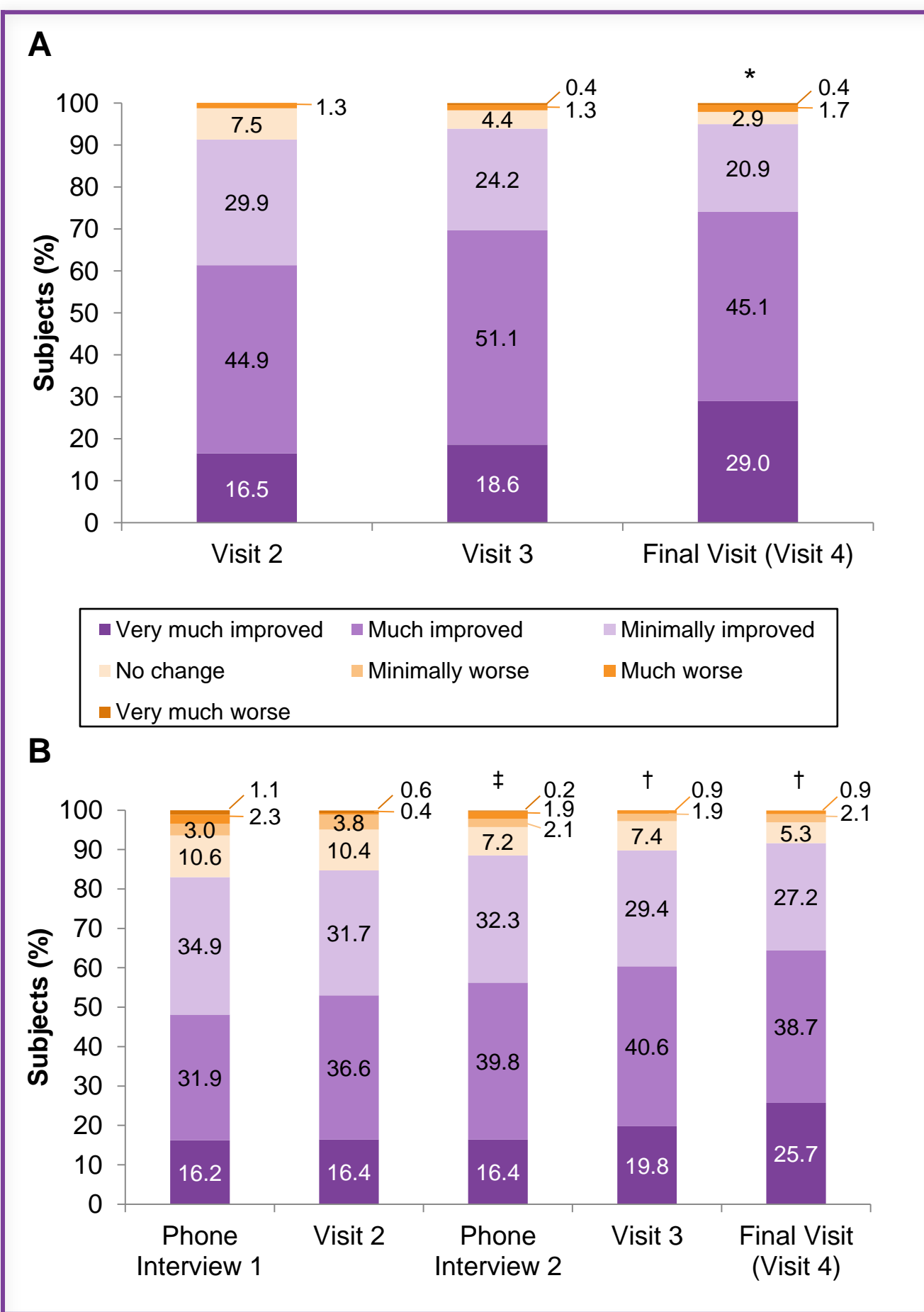
Figure 1. Toronto Western Spasmodic Torticollis Rating Scale



*P<0.0001 vs baseline; n = 479 for all visits. Scales range as follows: Severity, 0-35; Disability, 0-30; Pain, 0-20; and Total, 0-85, with higher scores being worse. Dot = mean; line in box = median; top & bottom of box = interquartile range; TWSTRS = Toronto Western Spasmodic Torticollis Rating Scale; whiskers = minimum & maximum.

- The percentage of physicians who rated patients' CD as minimally, much, or very much improved on the CGIC significantly increased from visit 2 to final visit (91.2% vs 95.0%; P<0.0001) (**Figure 2A**)
- Similarly, the percentage of subjects who reported their CD as minimally, much, or very much improved on the PGIC significantly increased from phone interview 1 to final visit (83.0% vs 91.7%; P<0.0001) (**Figure 2B**)

Figure 2. Clinician Global Impression of Change (A) and Patient Global Impression of Change (B)



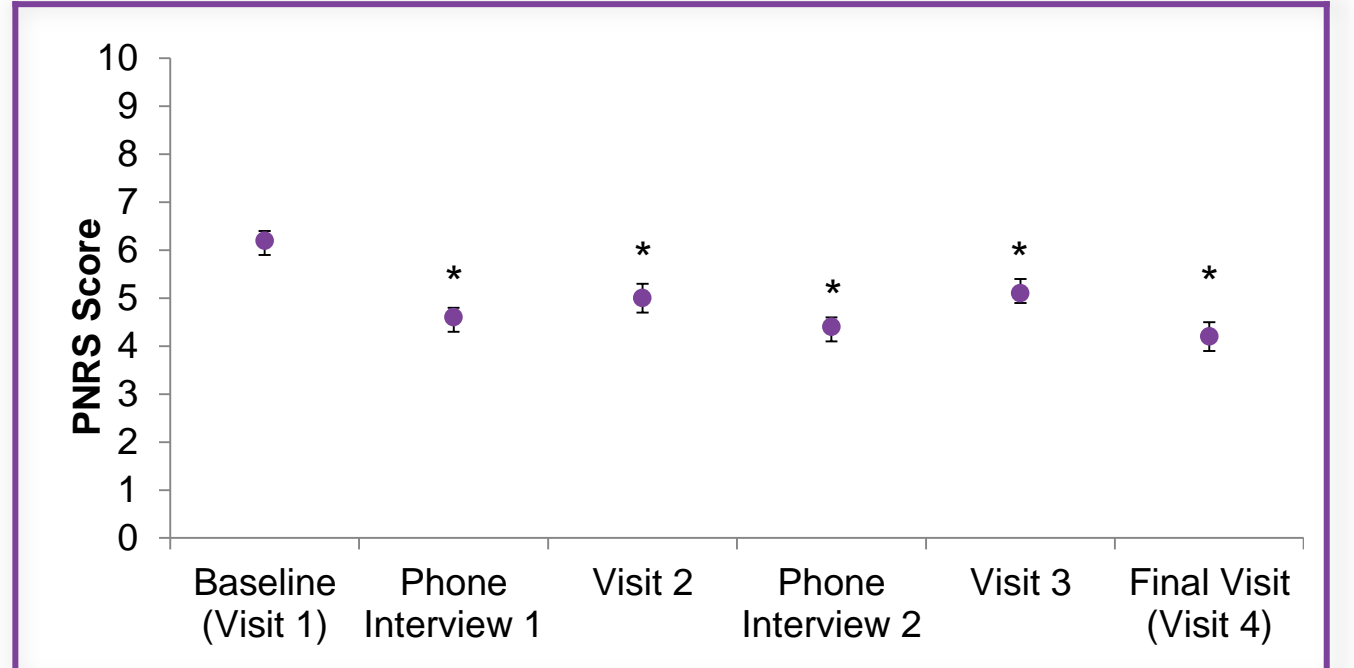
*P<0.0001 vs Visit 2; †P<0.0001 vs Phone interview 1; ‡P<0.05 vs Phone interview 1; n = 479 for all visits for CGIC; n = 470 for all visits for PGIC. CGIC = Clinician Global Impression of Change; PGIC = Patient Global Impression of Change.

DISCLOSURES

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- PNRS scores significantly decreased following onabotulinumtoxinA treatment from baseline to final assessment (6.2 ± 2.2 to 4.2 ± 2.5; P<0.0001).

Figure 3. Pain Numeric Rating Scale



*P<0.0001 vs. baseline; n = 286 for all visits. Includes only subjects with baseline score >0. Scores range from 0 to 10, with 10 the worst. Data are shown as mean ± 95% confidence interval. PNRS = Pain Numeric Rating Scale.

- The most common AEs (≥1%) were muscular weakness, dysphagia, neck pain, headache, injection site pain, and musculoskeletal pain

Table 2. Adverse Events

Event	Subjects, n (%)
Overall AEs	273 (26.2)
Muscular weakness	73 (7.0)
Dysphagia	67 (6.4)
Neck pain	28 (2.7)
Headache	16 (1.5)
Injection site pain	13 (1.2)
Musculoskeletal pain	10 (1.0)
Treatment-related AEs	185 (17.8)
SAEs	33 (3.2)
Treatment-related SAEs	4 (0.4)

Overall AEs ≥1% are shown. AEs = adverse events; SAEs = serious adverse events.

CONCLUSIONS

- OnabotulinumtoxinA treatment significantly improved CD symptoms, as indicated by physician- and patient-assessed measures. Benefits of treatment were sustained over time
- OnabotulinumtoxinA appears to be well tolerated with few treatment-related AEs, and no new safety signals were identified

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