Considerations for Initial Dosing of Botulinum Toxin in Treatment of Adductor Spasmodic Dysphonia

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Background

Spasmodic dysphonia (SD) is a rare neurological disorder that sporadically emerges in middle age, affecting intrinsic laryngeal muscle control during speech [1]. In the most common subtype, adductor SD, spasmodic bursts of activity in the thyroarytenoid (TA) muscles disrupt voluntary control, closing the vocal folds too tightly and creating a strained, strangled voice.

The standard of care for adductor-type SD is periodic Botulinum toxin A (Botox) injections into the TA muscles for symptomatic relief. In spite of copious research into this condition, little consensus exists regarding the appropriate initial dosing of Botox A. One report described a dose of 1.5 units or less bilaterally as providing better long-term dose stability than 2.5 units bilaterally, although no further analysis was undertaken of the difference between these dosage groups [2].

We sought to determine whether a lower initial dose of Botox A results in fewer side effects while providing similar therapeutic benefit.

Objectives

1) Assess the effect of an initial dose of Botox A on voice improvement and duration of breathiness in adductor SD.
2) Compare voice outcomes of initial bilaterally injected doses of 1.25 units (Group A) versus 2.5 units (Group B) of Botox A.

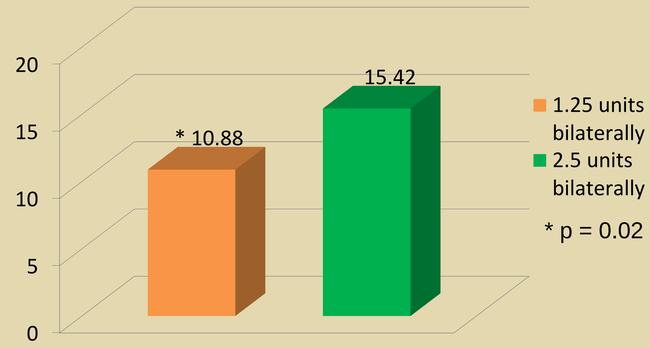
Methods

Institutional review board approval was granted for a retrospective chart review of all adductor spasmodic dysphonia patients treated at a tertiary care facility between 1990 and 2011. Patients had individualized treatment of Botox A injected into the TA muscles under EMG guidance via a submucosal cricothyroid membrane approach. Patients who lacked complete demographic or voice data, or underwent only one injection were excluded. Demographic data (age and sex), self-reported voice rating (on a scale of 1-4), duration of voice improvement, and breathiness were evaluated and compared between Groups A and B using Student's t-test and Fisher's exact test.

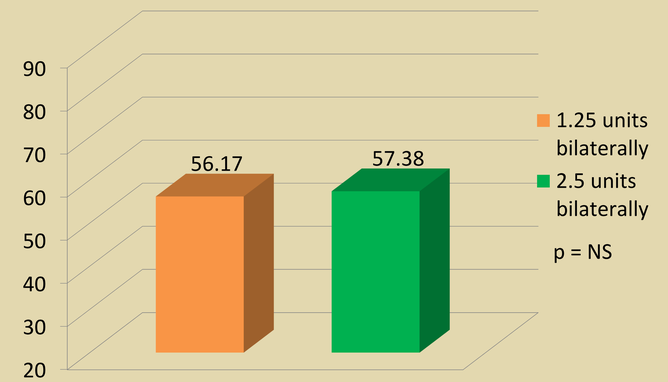
Results

Of the 478 patients identified, 305 (223 in group A, 82 in group B) patients met inclusion criteria. The average age of group A was 56.2 years old and group B was 57.4 years old (p=0.5). The female:male ratio was 2.91 for group A versus 3.56 for group B (p=0.55). Good voice outcomes (grade 3 or 4) were reported by 91% of group A patients versus 94% of group B (p=0.30). Both findings were non-significant by Fisher's exact test. The average duration of voice improvement was 99.7 days for group A and 108.3 for group B (p=0.54). The average duration of breathiness was 10.88 days for group A versus 15.42 for group B (p=0.02).

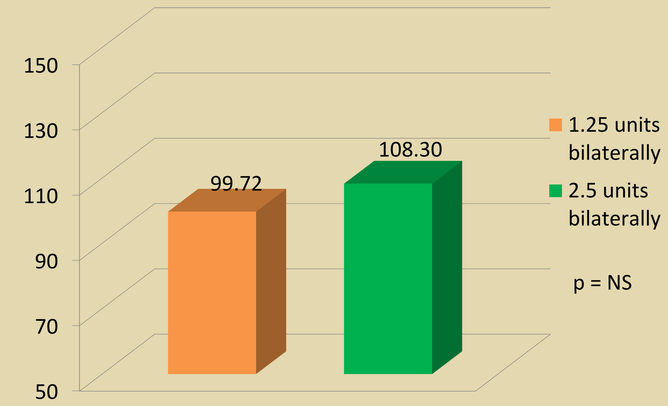
Duration of Breathiness (days)



Age (years)



Duration of Improved Voice (days)



Discussion:

SD is a chronic condition, interfering with a patient's daily communication, but for some people, the side effects of treatment with Botox A can also be disabling. Limiting these side effects is critical in maximizing time with functional voice, as well as ensuring patient compliance with the treatment regimen.

Patients injected with 1.25 units bilaterally had an average duration of breathiness that was significantly shorter than the higher dose without a statistically significant difference in voice outcome. This study therefore recommends injection with a relatively low initial Botox A dose with subsequent titration to achieve improved voice outcomes in patients with adductor SD.

References:

1. Ludlow CL. Spasmodic dysphonia: a laryngeal control disorder specific to speech. J Neurosci. 2011 Jan 19;31(3):793-7.

2. Holden PK, Vokes DE, Taylor MB, Till JA, Crumley RL. Long-term Botulinum toxin dose consistency for treatment of adductor spasmodic dysphonia. Ann Otol Rhinol Laryngol. 2007 Dec;116(12):891-6.