

Superior Laryngeal Nerve Block for Neurogenic Cough

James Duffy, BS; Julianna K. Litts, MS, CCC-SLP; Daniel Fink, MD
University of Colorado School of Medicine, Department of Otolaryngology

ABSTRACT

Objectives:

This study aimed to add to the body of evidence for efficacy of Superior Laryngeal Nerve (SLN) blocks for treatment of neurogenic cough. Efficacy at short- and long-term intervals are presented as well as relationships with laryngoscopic findings.

Methods:

A retrospective chart review of patients treated with SLN block between 2018-2020 was conducted. Patient demographics, videostroboscopic findings and patient subjective perception of outcomes were recorded and analyzed. Cough Severity Index (CSI) scores from pre-injection, short-term follow up, and long-term follow up were compared.

Results:

Twenty patients underwent SLN block in the clinic setting. Four patients were excluded for incomplete records. The indication was neurogenic cough refractory to medical management and/or cough suppression therapy. Patients with short-term follow up (n=13) had statistically significant decrease in CSI scores, with a mean baseline CSI of 24.3 decreasing to 16.15 ($P = 0.006$). Patients with evidence of Vocal Fold Motion/Vibratory Abnormalities (VFA) (n=8) showed improvement in short term CSI scores, with a mean baseline CSI of 24.13 decreasing to 14.5 ($P = 0.004$). Those without evidence of VFA did not have statistically significant improvement in short term CSI scores. At long-term follow up, patients with VFA had improvements that approached statistical significance with a mean baseline CSI of 22.56 decreasing to 14.56 ($P = 0.057$), while patients without VFA showed no improvement.

Conclusions:

Our results are consistent with previous literature indicating efficacy of SLN block. The presence of VFA may be an indicator of patients who experience increased therapeutic effect.

CONTACT

James Duffy, Medical Student
University of Colorado School of Medicine
Email: james.duffy@cuanschutz.edu

INTRODUCTION

- Cough is one of the most common issues causing patients to seek medical care in the United States
- Chronic cough has an estimated worldwide prevalence of 9.7% and is associated with significant morbidity including urinary incontinence, depression, insomnia and anxiety [1,2].
- Neurogenic Cough is a diagnosis of exclusion used to describe those with chronic persistent cough that cannot be attributed to more common etiologies.
- Neurogenic cough is hypothesized to be the result of acquired superior laryngeal nerve overactivity. Inflammatory insults such as viral infections, or environmental hazards cause persistent hypersensitivity of the internal branch [3]
- Previous retrospective studies have demonstrated potential efficacy of superior laryngeal nerve blocks in patients with neurogenic cough [4,5]
- This study aims to further evaluate the short and long term efficacy of superior laryngeal nerve blocks and offer the hypothesis that the presence of vocal fold motion abnormalities may be a predictor of SLN block success.

METHODS AND MATERIALS

Medical Records of patients who underwent in-office superior laryngeal nerve block were reviewed to compare Cough Severity Index (CSI) scores. Complete data sets were further stratified into those with vocal fold motion irregularities and those without. Approval was granted by the Colorado Multiple Institutional Review Board.

Inclusion Criteria

- Individuals with a diagnosis of refractory chronic cough
- Age 18-89 at the time of treatment
- Underwent a Superior Laryngeal Nerve Block on or after January 1, 2017
- Patients had at least three CSI scores documented

Exclusion Criteria

- Patients with incomplete cough severity index data (missing baseline or follow up scores)

Timeframe Stratification:

- Short Term Follow Up defined as less than 50 days
- Long Term Follow Up defined as greater than 100 days

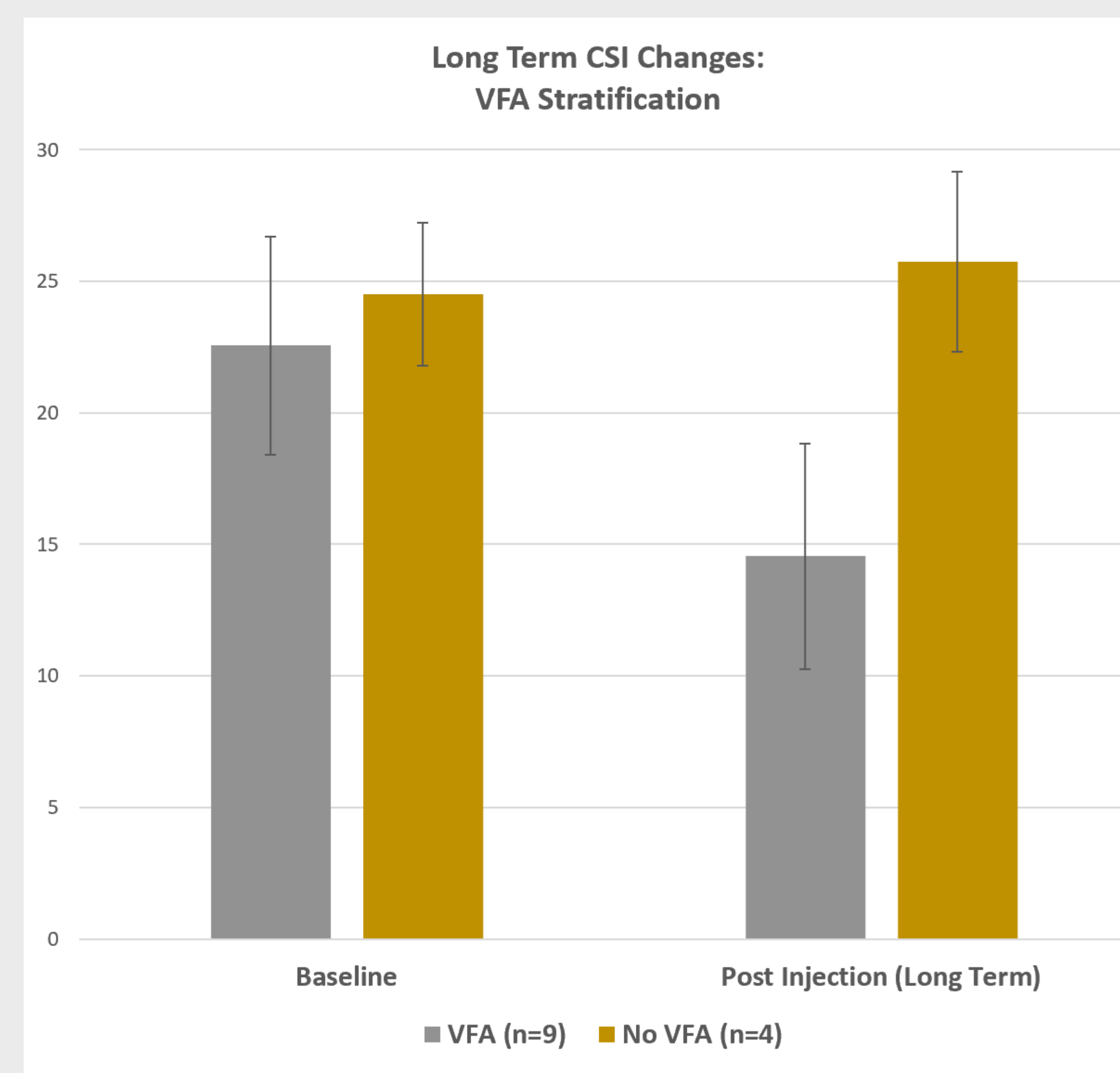
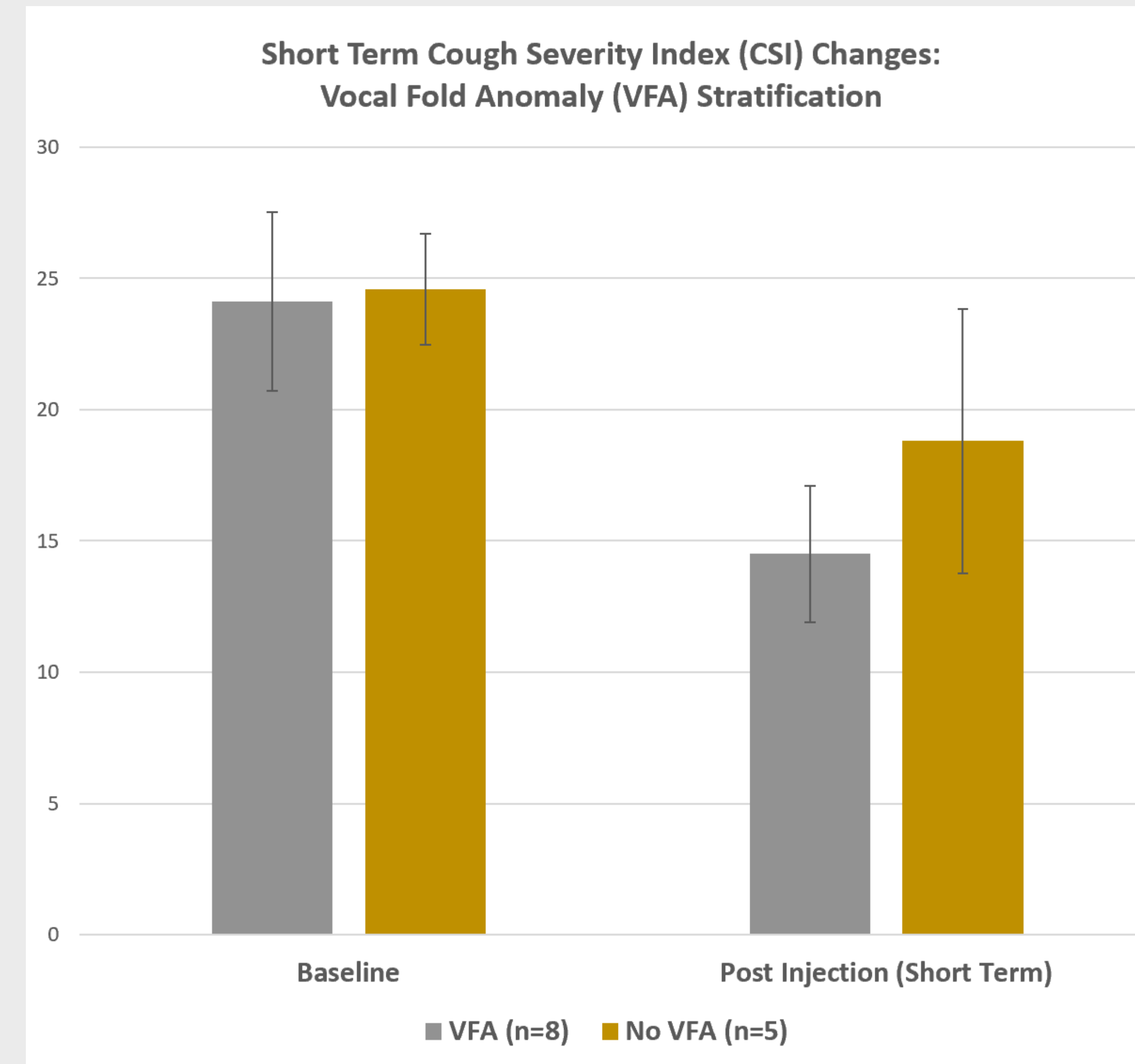
Vocal Fold Anomaly Stratification

- Laryngoscopy procedure notes that predated first SLN block were evaluated for vocal fold anomalies
- One patient did not have a documented laryngoscopy and was excluded from stratification
- Structural lesions (nodules etc.) were not considered

Statistical Analysis

- Parametric values for all groups and subgroups were calculated using paired student t-tests.
- Error bars in figures represent standard error of data sets.

FIGURES



CONCLUSIONS

- SLN block appears to have more efficacy in patients with underlying vocal fold motion abnormalities
- Superior laryngeal nerve block displays significant long-term efficacy, but has limited long-term efficacy

RESULTS

Short Term Follow Up:

- All Patients:
- Mean CSI Improvement = 8.15 ($P=0.006$)
 - 11/13 improved

VFA Patients:

- Mean Follow Up: 24.0 Days
- Mean CSI Improvement = 9.63 ($P=0.004$)
- 8/8 improved

No VFA Patients:

- Mean Follow Up: 23.6 Days
- Mean CSI Improvement = 5.8 ($P=.199$)
- 3/5 improved

Long Term Follow Up:

- All Patients:
- Mean CSI Improvement = 5.15 ($P=0.075$)
 - 6/13 improved

VFA Patients:

- Mean Follow Up: 269.22 Days
- Mean CSI Improvement = 8.00 ($P=0.057$)
- 5/9 improved

No VFA Patients:

- Mean Follow Up: 319.25 Days
- Mean CSI Improvement: -1.25 ($P=.268$)
- 1/4 improved

DISCUSSION

- Patients with neurogenic cough are hypothesized to have laryngeal nerve hypersensitivity
- Superior laryngeal nerve blocks have shown efficacy in the treatment of neurogenic cough
- Predicting what patients will have response to nerve blocks has been a challenge of therapy
- Vocal Fold Anomalies indicative of Vocal Fold paresis are a potential marker of vagal nerve hypersensitivity
- Our results indicate that patients with underlying vocal fold anomalies have better response to SLN block therapy
- Vocal fold motion abnormalities may be used as a clinical indicator for SLN block in patients with neurogenic cough

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