The Correlation of Nodule Size and Voice Quality in Children

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Abstract

A retrospective study was undertaken to examine the relationship between vocal fold nodule size and perceptual voice quality in children.

Nodule size was rated with a published validated scale (Shah, Feldman, & Nuss, 2007).

Perceptual judgments of voice quality were guided using the CAPE-V (Kempster, et al., 2009).

Results on 145 subjects showed a statistically significant relationship between nodule size and perceptual qualities.

Methods

Study approved by the Committee on Clinical Investigation at Children's Hospital Boston.

Inclusion criteria:
- Children 2 – 18 years of age
- Examinations from 2000 – 2009
- High-quality digital videolaryngoscopic exam confirming diagnosis of vocal fold nodules.
- Perceptual ratings of voice quality - Consensus Auditory Perceptual Evaluation of Voice (CAPE-V).

Pediatric ORL, with voice specialization, rated vocal fold nodules as small, moderate, or large, using previously validated scale.

Repeatability ratings completed.

Perceptual assessment of voice quality, based on CAPE-V, completed by SLP with expertise in pediatric voice.

Results

- Overall nodule size: Small 23%, Moderate 39%, Large 37%
- Univariate analysis – significant association between nodule size and roughness, strain, pitch, loudness, and overall severity.
- With the exception of loudness, mean value of perceptual characteristics increased with nodule size.
- Age – a significant factor associated with roughness (p-value: 0.0286) and overall severity (p-value: 0.0349).
- Gender – was not significant.

Statistical Analysis

- One-way ANOVA used to determine relationship between nodule size and perceptual variables at univariate level.
- Age groups and gender tested at univariate level using ANOVA and t-test.
- Nodule size as well as age and gender included for multivariate analysis using factorial ANOVA.
- Main effects and interactional terms checked for statistical significance.
- All tests two-sided and set 0.05 as standard type I error.

Discussion

While visual examination of the larynx continues to be the standard for care, study results show perceptual assessment using the CAPE-V offers an indirect means to follow vocal fold nodule size.

Findings suggest that perceptual voice assessment performed repeatedly over time is a reliable guide regarding size of previously diagnosed vocal fold nodules.

Summary

- Size matters:
  - Statistical correlation (p-value <0.05) found between nodule size and perceptual qualities: Roughness, Strain, Pitch, Loudness, and Overall Severity.
  - Except loudness, as nodule size increased, so did mean value of the perceptual characteristics.

References


