

Glottal Aerodynamics Estimated From Neck-Surface Vibration in Women With Phonotraumatic and Nonphonotraumatic Vocal Hyperfunction

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Abstract

Purpose: The purpose of this study was to determine whether estimates of glottal aerodynamic measures based on neck-surface vibration are comparable to those previously obtained using oral airflow and air pressure signals (Espinoza et al., 2017) in terms of discriminating patients with phonotraumatic and nonphonotraumatic vocal hyperfunction (PVH and NPVH) from vocally healthy controls.

Method: Consecutive /pae/ syllables at comfortable and loud level were produced by 16 women with PVH (organic vocal fold lesions), 16 women with NPVH (primary muscle tension dysphonia), and 32 vocally healthy women who were each matched to a patient according to age and occupation. Subglottal impedance-based inverse filtering of the anterior neck-surface accelerometer (ACC) signal yielded estimates of peak-to-peak glottal airflow, open quotient, and maximum flow declination rate. Average subglottal pressure and microphone-based sound pressure level (SPL) were also estimated from the ACC signal using subject-specific linear regression models. The ACC-based measures of glottal aerodynamics were normalized for SPL and statistically compared between each patient and matched-control group.

Results: Patients with PVH and NPVH exhibited lower SPL-normalized glottal aerodynamics values than their respective control subjects (p values ranging from < .01 to .07) with very large effect sizes (1.04-2.16), regardless of loudness condition or measurement method (i.e., ACC-based values maintained discriminatory power).

Conclusions: The results of this study demonstrate that ACC-based estimates of most glottal aerodynamic measures are comparable to those previously obtained from oral airflow and air pressure

(Espinoza et al., 2017) in terms of differentiating between hyperfunctional (PVH and NPVH) and normal vocal function. ACC-based estimates of glottal aerodynamic measures may be used to assess vocal function during continuous speech and enables this assessment of daily voice use during ambulatory monitoring to provide better insight into the pathophysiological mechanisms associated with vocal hyperfunction.

Palabras clave

KeyWords Plus: [SUBGLOTTAL PRESSURE](#); [VOICE DISORDERS](#); [ACCELERATION](#); [PREVALENCE](#); [INTENSITY](#); [FEATURES](#)

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