

Duration of biodynamic changes associated with water resistance therapy

Matthias Echternach¹, Marie Köberlein¹, Marco Guzman², Anne Maria Laukkanen³, Bernhard Richter⁴,
Marie-Anne Kainz¹, Michael Döllinger⁵

¹Division of Phoniatics and Pediatric Audiology, Department of Otorhinolaryngology, Munich University Hospital (LMU)

²Department of Communication Sciences and Disorders, Universidad de los Andes, Chile. Santiago, Chile

³Speech and Voice Research Laboratory, Faculty of Social Sciences, Tampere University, Tampere, Finland

⁴Institute of Musicians' Medicine, Freiburg University Medical Center and Medical Faculty, Freiburg University

⁵Division of Phoniatics and Pediatric Audiology at the Department of Otorhinolaryngology University Hospital Erlangen

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Introduction

In current voice research, there is a growing understanding of how semi-occluded vocal tract exercises contribute to an increase of vocal efficiency. However, it has not yet been clarified for how long the effects last.

Material and Methods

Eight vocally healthy subjects were asked to sustain a phonation on the vowel /i/, fundamental frequency of 250Hz (females) or 125Hz (males), and at a comfortable loudness. During phonation the subjects were simultaneously recorded with transnasal high speed videoendoscopy (HSV, 20.000fps), electroglottography, and audio signals. After that, these subjects performed a WRT for 10 minutes (tube of 30cm length, 5cm below the water surface). Repeated measurements of sustained phonation were performed 0, 5, 10, 20 and 30 minutes after exercising. From the HSV material the Glottal Area Waveform (GAW) was segmented and GAW parameters were computed.

Results

There were strong inter-individual differences concerning the courses of the different measures after WRT. In general, directly after WRT there was a lowering of the GAW derived Period Perturbation Quotient, a lowering of the closing quotient and an increase of the sound pressure level in comparison to the pre intervention measurement. However, only 5 minutes post WRT there was no longer a clear difference compared to the pre intervention. Other values such as open quotients exhibited no evident change directly after the intervention.

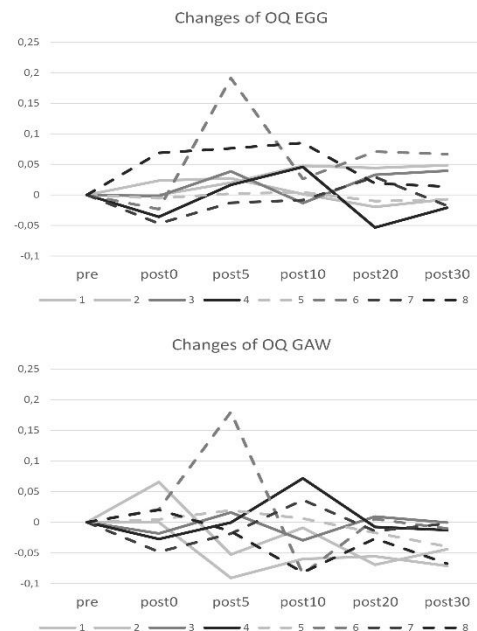


Figure 1: Changes of the Glottal Area Waveform (GAW) and the electroglottographical (EGG) Open Quotient (OQ) for all subjects

Conclusions

WRT showed strong inter-individual effects concerning the courses of the evaluated measures. General tendencies of some measures directly after the intervention showed a brief effect of only a few minutes