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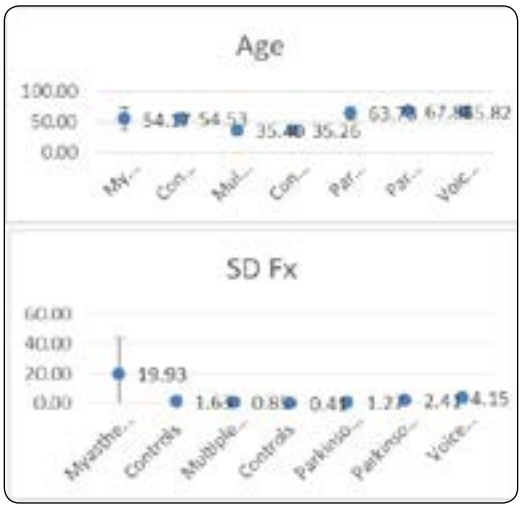
## The use of electroglottography in the assessment of voice in neurological diseases

**Statement of the Problem:** In the last eight years, there are an increased number of studies that gave emphasis on the quantification of voice symptomatology in different neurological diseases. The present speech aims to discuss the findings of voice production in these studies in neurological diseases such as myasthenia gravis (MG), multiple sclerosis (MS), essential voice tremor (ET), and Parkinson's disease (PD).

**Methodology & Theoretical Orientation:** All studies used a pair-matched methodology. A combination of tasks (sustained phonation and reading of a standard text passage) was used to measure voice. Electroglottography (EGG) as an indirect and non-invasive imaging technique, measures changes in electrical resistance between electrodes placed over the thyroid cartilage. EGG waveforms measure the duration of the relative vocal fold contact patterns within the glottal cycle and they are produced when the contact of the vocal folds increases as electrical impedance decreases. In ENT, EGG has been used to describe irregularities in vocal fold vibration in patients diagnosed with vocal fold nodules, vocal fold cysts and glottal cancers. In the present study, EGG numerical data were extracted and measures of central tendency were shown as a distribution of frequencies. The recordings were obtained using a laptop Sony Vaio that was connected to an electroglottograph processor (PCLX) (Laryngograph Ltd, London, UK).

**Findings:** The mean fundamental frequency of the vibrating vocal folds, the standard deviation of the vibrating vocal folds, the jitter and the fundamental frequency range were found to differentiate patient groups from the control groups.

**Conclusion & Significance:** EGG is a sensitive measure of pathology in the dysarthrophonia of different neurological diseases. Further research may study the quantification of voice early in the disease process to help in the differential neurological diagnosis (for example in diseases such as myasthenia gravis vs. ALS).



## Recent Publications

1. Konstantopoulos K, Christou Y P, Vogazianos P, Zamba-Papanicolaou E and Kleopas A K (2017) A quantitative method for the assessment of dysarthrophonia in myasthenia gravis. Journal of the Neurological Sciences 377:42-46.
2. Konstantopoulos K, Vikelis M, Seikel J A and Mitsikostas D (2010) The existence of phonatory instability in multiple sclerosis: An acoustic and electroglottographic study. Neurological Sciences 31(3):259-268.
3. Vavougios G D, Doskas T and Konstantopoulos K (2017) An electroglottographical analysis-based discriminant function model differentiating multiple sclerosis patients from healthy controls. Neurological Sciences 39(5):847-850.
4. Konstantopoulos K, Zamba-Papanicolaou E and Christodoulou K (2018) Quantification of dysarthrophonia in a Cypriot family with autosomal recessive hereditary spastic paraplegia associated with a homozygous SPG11 mutation. Neurological Sciences 39(9):1547-1550.

## Biography

Kostas Konstantopoulos has expertise in the "Quantification of dysarthrophonia in different neurological diseases". The major emphasis of his present research is on the differentiation among neurological groups from their speech/voice in order to contribute to the differential neurological diagnosis. He is an Assistant Professor in Speech Language Pathology at the European University, Cyprus, teaching a wide range of neurogenic courses in undergraduate and graduate levels. In 2018, he has been elected as a Vice President in the School of Health Sciences. Also, he has been Coordinator in the graduate program from 2016 to 2018 and now he serves as a Coordinator in the Bachelor's degree in Speech Therapy. He is also a Clinician at the Cyprus Institute of Neurology and Genetics since 2012.

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