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Contemporary clinical voice related technologies for the diagnosis of dystonia patients.

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We have made a prospective case control study of High Speed films measuring accurate single movements of the vocal cords which supplement earlier measures of the voice in a valuable way. With the High Speed apparatus (Wolf Ltd.), 4000 or 2000 pictures pr second can be chosen for 2 seconds. In 55 patients with dystonia the acoustic and electroglottographical waves (EGG) were evaluated visually including also kymography, and FFT up to 2000 Hz. With Spead software (Laryngograph Ltd.) the fundamental frequency and intensity during reading of a standard text and intonation of a sustained tone were analysed as well as the EGG closed phase Qx% of the vocal cords. A control group of 30 amateur singers and 12 other normal non singers was used. The 55 patients were divided in 5 groups according to their own evaluation of treatment effect, using a score from 1-100. To evaluate the possible use of High Speed films in dystonia patients we used the statistics of nominal logistic fit for the subjective improvement score. In the patients with laryngial dystonia and related disorders, the open quotient for the middle part of the vocal cords, and the rear open quotient of the first examination at High Speed films were significant for use, with a probability ChiSqr of 0.0009 and 0.0008 respectively. At the second examination the area measurements between the vocal cords and the open quotient in front were 0.0002 and 0.0027 respectively. Another interesting result analysis was the change of the five groups toward normal, with subjective complaints measured on the visual scale from 1-100. In the five groups the fundamental frequency was comparable. The ANOVA test showed a trend of difference of the middle quotient of the open phase at the High Speed films, comparing the dystonia patients with non dystonia patients. The visually coordinated rhythmic intonations that were found at the first examination with EGG and acoustical analysis were better at the second examination in the way that they resembled the normal population. In this presentation quantitative High Speed film measures of vocal cords open phases were made on open quotients in the front -, middle - and rear parts and the whole area, in real time. The results were compared with a normal group and amateur singers. The patients with treatment effect became significantly better as for the measured High Speed film results. In the future special phonetically balanced texts using the Spead software (Laryngograph Ltd.) can result in quantitative measurements of frequency and intensity differences between normal clients and dystonia patients in many languages.