Initial data on long-term effects of laryngeal vibro-tactile stimulation in people with spasmodic dysphonia

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INTRODUCTION

• Spasmodic dysphonia (SD) is a primary dystonia characterized by disfluent speech with strained voice quality.

• Previous work from our laboratory demonstrated that a one-time administration of vibro-tactile stimulation (VTS) to the larynx improved speech quality in people with SD.

• This is an ongoing Phase II clinical trial that examines the long-term effect of laryngeal VTS over 11 weeks.

• We here present initial data of the effect of a 5-week application of laryngeal VTS in a sample of patients with adductor SD.

METHODS

• VTS is applied by two vibrators placed on either sides of the skin over the tracheal cartilage (Fig 1).

• Participants were randomly assigned to two groups – (a) receiving VTS at 100 Hz or (b) at 40 Hz.

• Voice assessments required speaking 10 sentences that evoked the vibration of the vocal cords (voiced).

• We examined the smoothed cepstral peak prominence (CPPS) as a marker of voice quality. Change was examined compared to pre-VTS testing.

• The vocal effort for speaking the voiced sentences on a scale of 1-10, with 10 being maximal vocal effort, was examined.

• Participants were provided a portable VTS equipment for in-home training.

RESULTS

We present data from sessions 1 and 2 for 13 patients, of which 8 received 100Hz, and 5 received 40Hz.

• Initial analysis shows that 3 out of 13 participants show a positive increase in ΔCPPS above 2db (Figure on top).

• A positive ΔCPPS of > 2db indicates a meaningful improvement in voice quality.

• A negative change in vocal effort rating indicated lesser effort to speak.

• 2 subjects demonstrated a change below 3 in the rating of effort. (Figure at bottom).

DISCUSSION

• Patients receiving 40Hz stimulation may show a similar positive response to VTS as those receiving 100Hz. 40 Hz stimulation only stimulates tactile mechanoreceptors of the skin.

• There is initial evidence that 40 Hz VTS may lead to positive changes in the voice quality in SD.

• Further analysis of clinical ratings, voice breaks and electro-cortical activity will shed light on the effects of VTS in SD patients.

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Figure 2. Top. Timeline of study protocol. Bottom. Protocol for in-lab assessments

Figure 3. Top: Change in smoothed cepstral peak prominence. Bottom: Change in vocal effort rating; both while speaking voiced sentences compared to Pre-VTS testing.