SLP-P18

Effects of Whole Body Vibration and Direct Laryngeal Vibration on Perilaryngeal Relaxation:

A Multiple Treatment Reversal Design

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Introduction

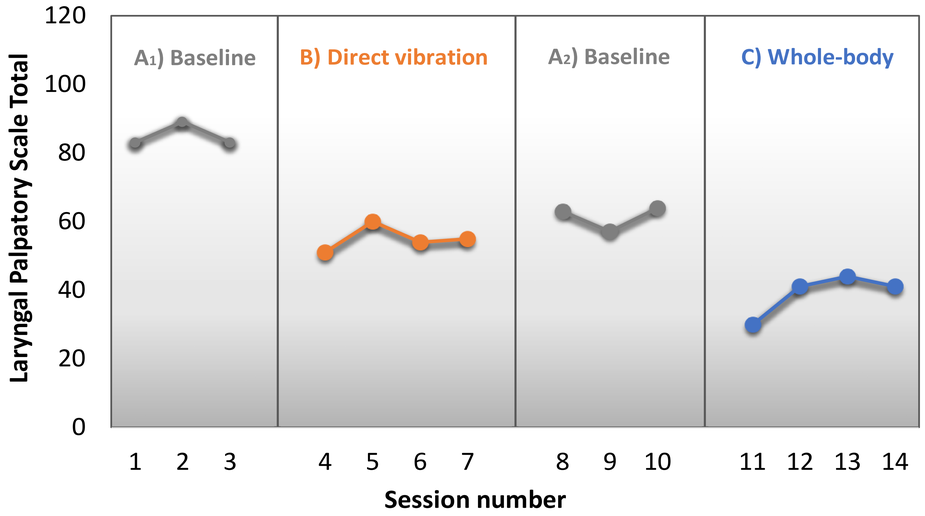
- Muscle Tension Dysphonia (MTD) is defined as excessive tension in the perilaryngeal and laryngeal muscles resulting in hoarseness and discomfort in the affected musculature. Signs are not limited to the larynx but may also manifest as postural issues and shallow, clavicular breathing[1].
- Lower frequency vibration (20–50 Hz) has been used to release muscle tension by inhibiting muscle activity[6].
- Whole-body vibration has been suggested to improve posture[5].
- Recent studies suggest that direct vibration on the perilaryngeal muscles and whole-body vibration both help to relieve vocal fatigue[6]. There is a need to contribute to this emerging body of research, testing with a broader range of treatment outcome measures, patient populations, and effects measured.
- Greater understanding of the effects of vibrational therapies would provide patients with an easily accessible method to treat MTD, improving delivery of care.

Project Aims

- Show improvements in laryngeal relaxation after vibrational treatments through direct assessment of laryngeal structures using quantitative measurement.
- Test whether whole-body vibration leads to greater relaxation of laryngeal musculature than direct vibration. Whole-body vibration is expected to improve muscle relaxation due to the possibility of additional postural benefits.
- This result would provide guidance in treatment for patients with MTD.

Results

The effects of direct laryngeal vibration, full body vibration, and baseline conditions on laryngeal relaxation using the Laryngeal Palpatory Scale (LPS)



LPS Results Summary

Visual Analysis

Change in dependent variable:	Latency:	Trend:
• Scores on the LPS in both treatment phases were lower when than in the baseline phases. • Scores on the LPS in the whole-body vibration treatment phase were lower than in the direct laryngeal vibration phase.	• Change in the dependent variable began shortly after changes to phase B and C. • No change in the dependent variable after change to phase A2.	B: No observed trend. C: Weak increasing trend observed within treatment phases.

Statistical Analysis

% of non-overlapping data:	Effect Size:
A_1 to B: 100%	**A_1 to B**: d=- 8.66, p=.0001, **significant**
B to A_2: 66%	**B to A_2:** d= - 1.68, p=0.0785, **not significant**
A_2 to C: 100%	**A_2 to C:** d= -5.90, p= .0028, **significant**

Methods

Subject: One non-musician with muscle tension dysphonia (MTD) (age 23)

Procedures:

Laryngeal Palpatory Scale[2]

- An expert clinician, blinded to the experimental phase, administered the LPS following each baseline and treatment phase.
- The LPS is valid and reliable instrument for quantitative measurements of severity of tension and postural issues in the head, neck, and shoulders which impact voice production.

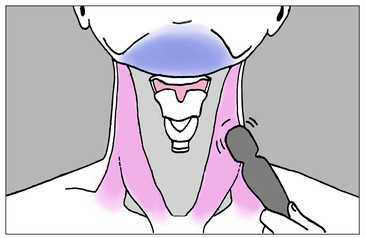


Figure 1: Massage targeted the bilateral sternocleidomastoid muscles, bilateral thyrohyoid space, & submental area

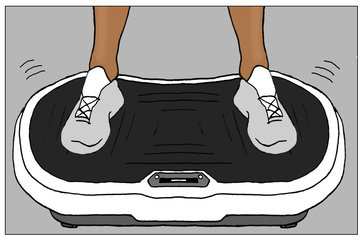


Figure 2

Phases

A) Baseline condition

B) Direct laryngeal vibration

- Fovel massager was used to apply vibration to the pictured perilaryngeal areas at 40 Hz for 10 minutes (1 minute in each position for two cycles).

C) Whole body vibration

- Subject stood on a Best Choice Products SKY3197 Full Body Vibration Platform set on a low frequency setting (40 Hz) for 10 minutes.

- Frequency of vibration was determined for each treatment session using the iPhone application *Vibration*.
- Dependent measures were analyzed using visual analysis and statistical analysis.

Discussion

- Post-treatment measures on the LPS improved after both treatments in comparison to pre-treatment baseline measures, indicating an effect of treatment from both direct laryngeal and whole-body vibration.
- Post-treatment measures on the LPS showed greater improvement between baseline and direct vibration than the second baseline and whole-body vibration. However, both results were statistically significant.
- The second baseline did not return to the severity of the original baseline.
  - Additional time between treatment sessions may be necessary to reduce carryover effects.
- The results suggest that both direct laryngeal vibration and whole-body vibration promote relaxation of the perilaryngeal musculature.
- Overall, weak evidence regarding the efficacy of treatment due to few demonstrations of treatment effect and small sample size[4].
- Future studies should include multiple participants, extend the length of the study to include more treatment and baseline phases, reverse the treatment order, and wait 48 hours between sessions.

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