Introduction

Purpose

The purpose of this study was to determine if respiratory retraining therapy would result in a reduction in
exerterial dyspnea and improved ventilatory response during exercise in an athlete with diagnosed PVFD.

Background

Paradoxical Vocal Fold Dysfunction (PVFD) is:

• The discrepancy of the vocal folds during either inspiration and/or expiration in the absence of
organic laryngeal pathology (Newman, Mason & Schmeltz, 1995; Rundell & Spiering, 2003; Brugman &
Simmons, 1998; Landwehr, Wood, Blager & Miller, 1996; McFadden & Zawadski, 1996)

• Differential diagnosis

• Direct laryngoscopic observation (Morrison et al, 1999)

• Ventilatory measures (Mathers-Schmidt, 2001; Goldman & Muers, 1991)

• Patient history (Sandage & Zelazny, 2004; Mathers-Schmidt, 2001; Andrianopoulos et al, 2000)

Potential etiologies

• Exhalation of chemoreceptors in the olfactory passages and pharynx due to irritation (Morrison et al, 1999)

• Psychological stressors including failure to respond to emotional situations, including conversion disorder
(Morrison et al, 1999; Treole, Trudeau & Forrest, 1999)

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• Laryngeal dystonia with neurological basis (Morrison et al, 1999; Treole, Trudeau & Forrest, 1999)

• Psychological stressors including failure to respond to emotional situations, including conversion disorder
(Morrison et al, 1999; Treole, Trudeau & Forrest, 1999)

Methods

Equipment

• Vmax Maximal System (SensorMedics Inc.; Vaxi-Laid Design)

• Tissue pulmonary and cardiology function in exercise

• Collects timing, flow and gas samples using a turbine connected outside of the facemask

• Separate end tidal CO2 Module (measures end tidal CO2)

• A Voice-activated, non-ventilatory facemask (centralized module 2001)

• Visual-Turb Labelturbo Version 5.05 software analysis program

• Same-labeled bicycle module 900

Subject Instructions:

• During baseline sessions, patient was instructed to:

• Signal onset of PVFD episode

• Frame breaths in a normal fashion

• Using sniff, blow or pant techniques, nasal inspiration, lip pursing (Sandage, personal communication, June 15, 2006; Andrews, 2002; Martin et al, 1987)

• Closed mouth/Deep nasal sniff inspiration

• Regulated pursed lip expiration through small oral opening

• Repeated measures ANOVA for main effect

• Tukey-Kramer HSD to compare significant main effect means (post-hoc)

Results

Table 1 Comparison of Respiratory Retraining Techniques in the Treatment of PVFD

<table>
<thead>
<tr>
<th>Technique</th>
<th>Exhalation</th>
<th>Inspiration</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>TxI</td>
<td>Increased</td>
<td>Increased</td>
<td>No significant difference</td>
</tr>
<tr>
<td>TxII</td>
<td>Increased</td>
<td>Increased</td>
<td>Increased significantly</td>
</tr>
</tbody>
</table>

Discussion

There are several potential etiologies for PVFD (Newman, Mason & Schmeltz, 1995). The role of psychological stressors, including conversion disorder, in the development of PVFD has been discussed (Morrison et al, 1999; Treole, Trudeau & Forrest, 1999). Laryngeal dystonia with neurological basis may also contribute to PVFD (Morrison et al, 1999; Treole, Trudeau & Forrest, 1999). Psychological stressors including failure to respond to emotional situations, including conversion disorder (Morrison et al, 1999; Treole, Trudeau & Forrest, 1999)

Conclusion

SensorMedics Inc.; Vaxi-Laid Design

• Visual-Turb Labelturbo Version 5.05 software analysis program

• Same-labeled bicycle module 900

References


• How are blood gas measures, including oxygen consumption (VO2), heart rate (HR), end tidal carbon dioxide (ETCO2), inspiratory and expiratory respiratory retraining tasks.

• How are respiratory timing measures, including inspiratory time (TI) and expiratory time (TE), and respiratory rate (RR), affected by respiratory retraining tasks?

• Which respiratory retraining task is more effective in returning parturient ventilation and respiratory timing to pre-episode levels?