Critical Review: Are prosthetic appliances for velopharyngeal dysfunction in cleft palate effective for improving speech intelligibility?

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This critical review examines the evidence regarding the impact on speech intelligibility with the use of a prosthetic device for cleft palate patients presenting with velopharyngeal dysfunction following primary surgical intervention. Study designs include case study, between group, and single group studies. Overall, the evidence gathered from this review suggests improvement in speech intelligibility following the insertion of a prosthetic device with speech therapy. Recommendations for future research and clinical practice are provided.

Introduction

Velopharyngeal dysfunction (VPD) is the inability to completely close the nasal airway during speech (Woo, 2012). VPD can be categorized as velopharyngeal incompetence (VPI), a physiological deficiency resulting in poor movement of the velopharyngeal structures, or velopharyngeal insufficiency, an anatomical deficit resulting in poor velopharyngeal closure due to structural deficiencies (Kummer, 2014). VPD following surgery for cleft palate repair occurs in 20-30% of cases, and such cases are often associated with negative outcomes for speech production. (Woo, 2012; Ha, Koh, Moon, Jung, & Oh 2015). As reported by Woo (2012), VPD may be characterized by hypernasality, nasal emission, decreased vocal intensity, facial grimacing, as well as compensatory articulation strategies all resulting in decreased intelligibility.

Current treatment methods for individuals with VPD following primary surgery consist of secondary surgery, the use of prosthetic devices, as well as speech therapy. Although a potential treatment option, secondary surgery is not suitable for all patients due to various contradictions (Pinto, Dalben, & Pegoraro-Krook 2007). According to Pinto et al. (2007), prosthetic devices can be used in these instances to improve velopharyngeal closure. Prosthetic devices in individuals with VPD can compensate for minimal movement of the pharyngeal walls, reduce the structural opening separating the oropharynx from the nasopharynx, as well as compensate for insufficient palatopharygeal tissue during speech and feeding (Bispo, Whitaker, Aferri, Neves, Dutka, & Pegoraro-Krook 2011; Agrawal, Singh, Chand & Patel 2011; Shin & Ko 2015). As not all individuals presenting with VPD are eligible for a secondary surgery, it is imperative to explore effective, non-surgical treatment options in order to increase speech intelligibility. Pharyngeal/palatal obturator, speech bulb, and palatal lift prostheses are removable prosthetic devices used to achieve closure of the velopharyngeal port. A pharyngeal obturator has a superiorly located acrylic extension used to

Data Collection

The results of the literature search yielded the following types of articles in line with the selection criteria mentioned above: case study (3), single-group study (2), and between group study (1).

Results

Case Study

Case studies are used to conduct research for a small population, and as such, are appropriate for examining cases of

pathologists as well as objective gold standard assessment measures such as nasoendoscopy and nasometry were used to assess hypernasality and speech intelligibility. The palatal lift prosthesis was fitted for each patient and speech samples with and without the prosthetic device in place were taken in a noise-free environment immediately after insertion, at the

3. Researchers should consistently employ objective approaches to the analysis of relevant data.

Conclusion

With reasonable consistency, prosthetic devices with speech therapy show reduction in hypernasality, nasalence, nasal regurgitation and improved speech intelligibility (Agrawal et al., 2011; Shin et al., 2015; Bispo et al., 2011). Somewhat suggestive evidence that higher success rates were associated with speech therapy, yet further research is required.

Clinical Implications