Critical Review:
In children with cerebral palsy, what treatment methods are effective in improving speech production?

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This critical review examined the evidence regarding effective treatment methods for improving speech production in children with cerebral palsy. Study designs include single subject "n of 1" design (3), single group pre-post test (2) and a case study. Overall, the evidence summarized in this review is considered inconclusive and it is recommended that additional research be completed.

Introduction

Cerebral palsy (CP) affects approximately 1-2/1000 births each year, making it one of the most common motor disorders amongst children (Paneth & Hong, 2006). Cerebral palsy has recently been defined as an umbrella term that describes a movement or posture disorder that is caused by a non-progressive interference, lesion, or abnormality in the immature brain. It is a permanent, yet unchanging disorder that persists throughout one"s life. (Rosenbaum, Paneth, Leviton, Goldstein & Bax, 2007) Because the underlying cause of CP is not curable, children must cope with the disorder for the remainder of their life. Some characteristics of CP may include difficulties in speech and language, and/or communication (Pennington, Goldbart, & Marshall, 2005).

Speech problems associated with cerebral palsy may include articulation errors, oral motor difficulties, rate or prosody errors, and dysarthria. Dysarthria is defined as "speech disorders resulting from disturbances in musculature control over the speech mechanism due to damage of the central or peripheral nervous system. It designates problems in oral communication due to paralysis, weakness, or in coordination of the speech musculature"(Duffy, 2005). Dysarthria can greatly reduce the intelligibility of one"s speech, and make it difficult for those with dysarthria to communicate with others. A study on the characteristics of speech in children with cerebral palsy by Kiran, Ustuner Ati

and weaknesses of this study, the level of evidence for this study is suggestive.

Another single subject, multiple baseline study was performed by Marchant, McAuliffe, and Huckabee (2007). This article examined the effectiveness of two

The single group pre-post test design is an appropriate method to investigate effects of a treatment in

the function of the tongue, lips and jaw, intelligibility

Recommendations

This literature review examined several different treatment approaches to improve speech in children with cerebral palsy. Based on the literature, it is concluded that there is limited evidence to endorse any type of treatment approach to improve speech in this population of children. There is, however, a trend within this subset of literature to support the use of a phonetic based approach to improve speech production. Studies by Marchant, McAuliffe, and Huckabee (2007) as well as Wu, and Jeng (2004) yielded results indicating that this method of intervention improved speech in children with cerebral palsy. Although these studies generated similar results, they were both judged to have weaknesses regarding external validity, ecological validity and completeness within their results both quantitatively and qualitatively. Further studies involving larger samples and stronger study designs are required to strengthen the evidence for using a phonetic based approach to improve speech in children with cerebral palsy.

The studies examined within this literature review are preliminary studies piloting research in new treatment approaches to improve speech in children with cerebral palsy. The importance of these studies to this area of research is compelling, as they are the first of their kind to study each intervention method. However, of these studies there were many areas of weakness in terms of participant selection, methodology, and results. Reliability and validity within each study were judged to be weak, and thus the results should be interpreted with caution.

With regard to future research in the area of treatment methods to improve speech in children with cerebral palsy, it is recommended that the following be considered:

1) Participants should be grouped by both type and severity of cerebral palsy in order to identify treatment methods and trends pertinent to each group.

2) Control for maturation effects by including older children and also by incorporating untreated control groups.

3) Future studies should consider the use of conversational speech tasks in the assessment and treatment procedures in order to increase the ecological validity of the results.

4) Larger sample sizes and better experimental designs are required to

with cerebral palsy: findings from six cases. *Child Language Teaching and Therapy, 22:3,* 255-273.

Puyuelo, M., & Ron