A Systematic Review of Treatment Approaches for Childhood Apraxia of Speech

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Introduction

Childhood Apraxia of Speech (CAS) is defined as "a neurological childhood (pediatric) speech sound disorder in which the precision and consistency of movements underlying speech are impaired in the absence of neuromuscular deficits" (*ASHA Position Statement,* 2007). CAS is an increasingly common diagnosis, but there is a shortage of empirical evidence to support the use of evidence-based practice in clinical treatment.

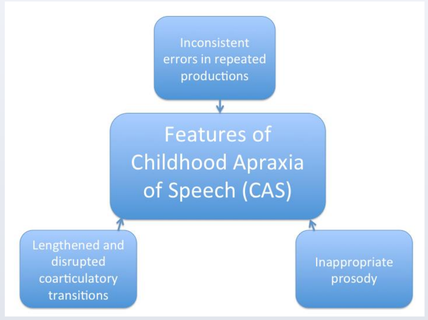

Figure 1. Three features associated with CAS according to the 2007 ASHA Position Statement.

Objective

This systematic review aimed to investigate the highest quality evidence available concerning the efficacy of different treatent approaches for CAS.

Question

Based on the currently available research, is there evidence that one type of treatment approach (AAC, motor programming, language, sensory cueing, or prosodic facilitation) is more efficacious than another type of treatment for children with CAS?

Methods

Search terms utilized:

- Child* OR childhood OR adolesce*
- Childhood apraxia of speech OR developmental apraxia
- Treatment OR therap* OR intervention* OR sensory cueing OR motor programming OR linguistic OR cycles OR PROMPT OR AAC

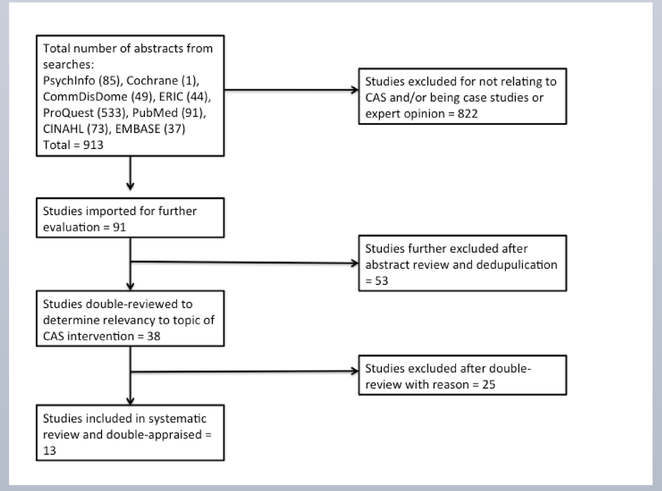

Figure 2: A flow chart representing our search strategy.

Methods (continued)

Inclusion criteria:

- Publication years between: 2008-2015
- Studies focused exclusively on participants with CAS
- Measured aspects of speech intelligibility
- Implemented speech-language therapy techniques

Exclusion criteria:

- Case studies or expert opinion
- Diagnostic studies

Articles were critically appraised using:

- Quality Indicator Checklist (SCEDs)
- Cincinnati Children's Hospital Medical Center Evidence Appraisal Checklists (RCTs, Systematic Reviews)

Each article was independently appraised by two students and results were compared to reach a consensus on overall quality of evidence for each study.

Results

Authors	Publication Year	Intervention Type	Study Design	Appraisal Quality
Morgan & Vogel	2008	All	Systematic Review	1a
McNeill, Gillon, & Dodd	2009	Language	Multiple single-subject design	Adequate
Iuzzini & Forrest	2010	Motor & Language	Single-subject multiple baselines across subjects	Poor
Edeal & Gildersleeve-Neumann	2011	Motor	Single-subject AB design	Adequate
Martikainen & Korpilahti	2011	Motor	Single-subject multi-element	Adequate
Maas, Butalla, & Farinella	2012	Motor	Single-subject AB design	Good
Maas & Farinella	2012	Motor	Single-subject AB design	Good
Dale & Hayden	2013	Motor	ABB and ACB	Good
Preston, Brick, & Landi	2013	Motor	Single-subject multiple baselines across behaviors	Poor
Murray, McCabe, & Ballard	2014	All	Systematic Review	1b
Skelton & Hagopian	2014	Motor	Single-subject multiple baselines across subjects	Good
Thomas, McCabe, & Ballard	2014	Motor	Single-subject multiple baselines across subjects	Adequate
Murray, McCabe, & Ballard	2015	Motor	RCT	2b

Figure 3: A table representing the results of our systematic review, including the quality of the study as determined by our appraisal method.

Overall, a very limited body of *high-quality* research was found to answer our research question. Evidence provided by these articles was mainly appraised to be of moderate quality with limitations that prevented widespread applicability to clinical practice. However, within the context of the respective studies, some interventions did demonstrate measurable gains.

Results (continued)

- The majority of studies included in this systematic review used motor approaches to treat CAS.
  - A limited number of studies addressed language-based treatment or a combined motor and language treatment approaches.
- There was tremendous variation in the type of approaches, fidelity of implementation, and duration of treatment.
- The general trend of the studies included suggests that motor and/or language approaches to CAS treatment improve certain aspects of speech intelligibility:
  - For example, improved percentage of consonants correct (PCC), increased accuracy of untreated probe items, improved sequencing abilities, etc.
- Based on the lack of high-quality research evidence, the 2008 Cochrane systematic review (Morgan & Vogel) yielded no recommendations for clinical treatment of individuals with CAS. However, the 2014 systematic review (Murray, McCabe, & Ballard) determined that three intervention strategies presented with sufficient evidence for interim clinical practice and further investigation. These interventions include:
  - Integral Stimulation/Dynamic Temporal and Tactile Cueing
  - Rapid Syllable Transition Treatment
  - Integrated Phonological Awareness Integration

Conclusion

- In summary, there is a need for additional research studies of a higher-quality experimental design (e.g., RCTs) to examine the effectiveness of treatment approaches for individuals with CAS.
- The currently available evidence suggests that certain motor and/or language approaches to treatment may be suitable for interim use in clinical practice pending further research publications, as was also found in the 2014 systematic review.
- However, speech-language pathologists working clinically need to be cautious in their implementation of interventions for CAS that currently have limited empirical support.

Contact Information

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References

A full list of references is available upon request.