Childhood Apraxia of Speech and Hearing Loss:
A comparative study exploring the possibility of dual-diagnoses

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Disclosure

- Full-time employee of The River School

- No other relevant financial or nonfinancial relationships to disclose
Childhood Apraxia of Speech

- Motor planning disorder that involves the breakdown from phonological code into motor commands
  (Button et al., 2013)

- Broad range of language problems

- More likely to present with comorbid reading, spelling, and academic difficulties
  (Freebairn et al., 2004)
Hearing loss is typically a rule out when diagnosing CAS

- children with hearing loss often present with delayed speech production, including babbling.
- Reduced motor sequencing movements involved in speech creates atypical development

- Complicates differential and/or comorbid diagnosis
Demographics

- CI+ CAS (n = 10)
- CI only (n = 10)
- CI+CAS (2.3 years)
- CI only (2.0 years)
- CI+CAS (5 females, 5 males)
- CI only (7 females, 3 males)

All enrolled in the same inclusive educational environment
Assessments Administered

- **Expressive Language**
  - Clinical Evaluation of Language Fundamentals – 4th edition (CELF-4)

- **Articulation**
  - Goldman-Fristoe Test of Articulation – Second Edition (GFTA-2)

- **Phonological Processing**
  - Test of Auditory Processing Skills – 3rd Edition (TAPS-3)
• **Working Memory**
  • Kaufman Assessment Battery for Children – KABC, Sequential Processing Scale

• **Word Reading**
  • Wide Range Achievement Test – WRAT, word reading

• **Spelling**
  • WRAT, spelling
Results

- CI+CAS group performed significantly lower on the following measures.
Expressive Language (CELF-4)

CI Only: 96.5
CI+CAS: 76.4

p = 0.01*

CI Only | CI+CAS
--- | ---
96.5 | 76.4
Articulation (GFTA-2)

CI Only: 93.6
CI+CAS: 80.4

p=0.045*

CI Only | CI+CAS
---------|---------
95       | 90
90       | 85
85       | 80
80       | 75
75       | 70

Legend:
CI Only  | CI+CAS
Phonological Processing (TAPS)

![Bar chart showing comparison between CI Only and CI+CAS, with CI Only having a score of 101.4 and CI+CAS having a score of 89.6, and a p-value of 0.01*]
Spelling (WRAT)

CI Only: 114.5
CI+CAS: 103.3

p=0.04*
Working Memory (KBAC)

CI Only: 103.4
CI+CAS: 93.7

p=0.06
Conclusion

- significant difference across domains for CI + CAS, compared to a control group of children with CI only

- This research supports the possibility of a comorbid and distinct CAS diagnosis
Implications

- How can we intervene to improve outcomes for children with CIs as well as CAS?
  - Employ a motor speech approach to target articulation
  - Begin phonological intervention early
  - Focus on targeting expressive language
References


