CHILDHOOD APRAXIA OF SPEECH: OVERVIEW OF TREATMENT APPROACHES

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Background

Speech sound production is a process that involves articulation of the individual phonemes that make up spoken words. A disruption in this process can result in different types of disordered speech, which can affect both children and adults.

A common speech sound disorder found in children is childhood apraxia of speech (CAS). Currently, it remains unknown which type of treatment or intervention approach is most beneficial for this population. The following information is meant to provide the most recent evidence-based data for treatment approaches designed to improve the planning and programming abilities of children with CAS.

Neurologic Component

CAS is a pediatric speech sound disorder that involves a disconnect in the brain's ability to plan and program the functions necessary for speech output. According to van der Merwe and Steyn (2018), CAS is an inconsistency in the precision of movements of speech in the absence of neuromuscular deficits (van der Merwe & Steyn, 2018). Children with CAS understand and know what they want to say, but their brains are not able to direct and coordinate the muscles necessary for speech production.

Etiologies

According to ASHA (2019), CAS can be congenital or acquired during language development. CAS can occur as an idiopathic neurogenic speech sound disorder, meaning that it can occur in children with no other observable neurologic conditions.

CAS can also present as primary or secondary signs and symptoms in children with the following co-existing conditions: Autism Spectrum Disorder (ASD), epilepsy, fragile X syndrome, Rett syndrome, and Prader-Willi syndrome.

Signs and Symptoms

Three main characteristics:

1. Inconsistency in errors during repeated productions of words
2. Lengthened coarticulatory transitions between sounds and syllables
3. Inappropriate prosody

The three features above are consensus-based diagnostic markers of CAS, and they reflect impaired motor control. Other characteristics of CAS include articulatory searching prior to phonation (e.g., groping behaviors), speech sound distortions, voicing errors, equal stress, and lexical errors (van der Merwe & Steyn, 2018). Some researchers believe that symptoms of CAS can appear as soon as the child has begun the process of language acquisition, whereas some researchers and professionals believe that children can be identified with having CAS as young as 18 months of age (Murray et al., 2015).

Diagnosis

A comprehensive evaluation of speech sound production involves several different formal and informal measures, including a case history, a full oral mechanism examination, speech sound production assessments, and language evaluations if needed. One formal assessment used to identify a child presenting with CAS is The Kaufman Speech Praxis Test (KSPT). The KSPT is a norm referenced, diagnostic tool that is used to identify CAS and to provide possible goals areas of focus in treatment. Other formal measures used to identify CAS include The Orofacial Praxis Test, the Verbal Motor Production Assessment for Children, and the Dynamic Evaluation of Motor Speech Skill.

Differential Diagnosis

Differential diagnosis is the process of distinguishing between two or more conditions that present with similar characteristics or symptoms. According to Murray, McCabe, and Ballard (2015), the typical standard for diagnosing CAS involves the use of formal and informal assessment measures in addition to expert opinion.

Intervention Approaches

Dynamic Temporal and Tactile Cueing (DTTC)

- Dynamic Temporal and Tactile Cueing (DTTC) is an integrated approach that involves stimulation (look, listen, attempt) and a systematic cueing hierarchy (ASHA, 2019). This approach is based on the principles of motor learning and is frequently used with younger children with moderate to severe CAS. Cueing involves auditory, visual, gestural, and verbal instruction that is gradually decreased as the child demonstrates progression.

Rapid Syllable Transition Treatment (ReST)

- ReST is an approach that utilizes multiple repetitions of various sequences in both nonreal words and real words. The approach is implemented through intense practice, with a focus on practice in producing multisyllabic words and phonetically similar non real words. The goal of the approach is to promote accuracies in speech sound production and fluency in transition from one sound or syllable to the next (Murray et al., 2014).

Nuffield Dyspraxia Program (NDP3)

- The Nuffield Dyspraxia Program (NDP3) is a treatment approach based on the principles of motor programming. This approach focuses on speech output and the ability of the child to learn motor programming skills. NDP3 is a psycholinguistic framework that involves a "bottom-up" approach to skill building (Murray, McCabe, & Ballard, 2015). Targets include production of individual speech sounds (phonemes), complex syllables or syllable combinations, and progression to sentences and connected speech.

Intervention Approaches Continued

Prompts for Restructuring Oral Muscular Phonetic Targets

- PROMPT is a tactile kinesthetic-based treatment approach that uses touch cues on the client's jaw, lip, and tongue to manually guide the client through the production of words. Treatment using the PROMPT approach is generally implemented in a bottom-up design. The clinician acts as an external programmer of the movements of speech.

Service Delivery Options

- Recent advances in service delivery models have identified an additional, yet beneficial, delivery of treatment called Telehealth. Telehealth delivery options involve the application of technology to the delivery of rehabilitative services, including speech and language therapy.

Feedback Options

- According to Preston, Brick, and Landi (2013), biofeedback is an instrumental form of feedback that examines physiological functions by producing visual images of the client's performance. Biofeedback allows the client to identify the structures that were performing appropriately or inappropriately during speech tasks.

Conclusions

As time continues and diagnostic measures continue to improve, the number of children diagnosed with CAS will likely increase. It is the ethical duty of licensed speech-language pathologists to provide the most recent evidenced-based treatment to date. Treatment approaches, such as Rapid Syllable Transition Treatment (ReST), The Nuffield Dyspraxia Program (NDP3), Prompts for Restructuring Oral Muscular Phonetic Targets (PROMPT), and Dynamic Temporal and Tactile Cueing (DTTC), may all be valid options for treatment of CAS due to the level of support in the research (Murray, McCabe, & Ballard 2014). In addition, it is important to consider age and severity when selecting an approach. For example, a younger child with more severe CAS may benefit from treatment involving NDP3, whereas older children may benefit from ReST. For any aspect of treatment planning for CAS or any type of speech sound disorder, SLPs must base their decisions on the most recent evidence-based practices, in addition to their own clinical expertise.

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