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Structured Speech-Language Therapy with AAC in a Child with Cerebral Palsy and Developmental Delay: Clinical Findings from a Case Study

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ABSTRACT:

Purpose

Children with Cerebral Palsy frequently demonstrate communication impairments associated with oral motor dysfunction, delayed language acquisition, cognitive limitations, and impaired social interaction. The present case study aimed to evaluate the effectiveness of structured speech-language intervention in improving communication and pre-linguistic abilities in a child diagnosed with Cerebral Palsy, Intellectual Disability, and Developmental Delay.

Method

A 5.5-year-old female child diagnosed with Cerebral Palsy associated with Intellectual Disability and Speech-Language Developmental Delay underwent comprehensive speech-language assessment. Initial evaluation revealed severe receptive and expressive language delay, impaired oral motor functioning, poor joint attention, reduced imitation, feeding difficulties, and poor communicative intent. Individualized intervention consisting of play therapy, joint attention training, modelling, imitation therapy, language stimulation, AAC and parent counselling was provided.

Results

Post-therapy findings demonstrated improvement in receptive and expressive language abilities from the 9–10 month developmental level to the 16–18 month level. Improvements were also observed in eye contact, imitation abilities, play participation, communicative intent, vocalization, and attention during structured activities.

Conclusion

Structured speech-language intervention combined with caregiver participation contributed positively toward communication development and pre-linguistic skill enhancement in the child. Continued therapy and home-based intervention are recommended for further improvement in functional communication and social participation.

Keywords

Cerebral Palsy; Intellectual Disability; Speech-Language Therapy; Developmental Delay; Pre-linguistic Skills; Communication Intervention

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1. INTRODUCTION

Cerebral Palsy (CP) is a group of permanent disorders affecting movement and posture caused by non-progressive disturbances occurring in the developing fetal or infant brain. Children with CP commonly present with motor impairment, oral motor dysfunction, feeding difficulties, speech deficits, cognitive limitations, and delayed communication development (Bax et al., 2005).

Speech and language difficulties are frequently observed in children with CP due to impaired neuromuscular control affecting respiration, phonation, articulation, resonance, and oral motor coordination. Associated Intellectual Disability may further impair language acquisition, attention, adaptive functioning, and social interaction.

Pre-linguistic skills such as eye contact, joint attention, imitation, play behavior, and communicative intent are considered essential prerequisites for language acquisition. Deficits in these foundational skills often contribute to delayed expressive and receptive language development in children with neurodevelopmental disorders.

Augmentative and Alternative Communication (AAC) approaches are frequently used in children with severe communication impairments to facilitate functional communication and improve participation in social interactions. AAC may include gestures, picture-based communication systems, communication boards, visual supports, and other aided or unaided communication strategies. In children with Cerebral Palsy and associated developmental disabilities, AAC can support expressive communication, reduce frustration, and enhance communicative intent during interaction.

Speech-language therapy aims to facilitate communication abilities, improve interaction, enhance functional participation, and support caregiver-mediated communication strategies. Intervention techniques such as play-based therapy, language stimulation, modelling, and joint attention training have demonstrated positive outcomes in improving communication abilities in children with developmental disabilities.

The present study describes the assessment findings, intervention process, and therapeutic outcomes in a child diagnosed with Cerebral Palsy associated with Intellectual Disability and Speech-Language Developmental Delay.

2. SPEECH-LANGUAGE THERAPY

Speech-Language Therapy (SLT) is a specialized intervention designed to improve communication, speech production, language comprehension, expressive language, social interaction, and feeding/swallowing abilities in individuals with communication disorders. In children with Cerebral Palsy (CP) and Developmental Delay, speech-language therapy helps develop functional communication skills, enhance social participation, and improve quality of life.

Children with cerebral palsy often experience difficulties in speech production due to impaired oral motor control, muscle weakness, poor coordination, and cognitive challenges. Speech-language therapy addresses these difficulties through structured activities that focus on improving attention, eye contact, joint attention, receptive language, expressive language, articulation, and communication intent. When verbal speech is limited, Augmentative and

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Alternative Communication (AAC) systems such as picture boards, communication books, and speech-generating devices are incorporated to support communication.

Augmentative and Alternative Communication (AAC) refers to a range of communication methods used to support or replace spoken language in individuals with significant speech and language impairments. Children with cerebral palsy and developmental delay often experience difficulties in verbal communication due to motor impairments, oral motor dysfunction, cognitive limitations, and delayed language development. AAC provides these children with alternative means of expressing their needs, thoughts, emotions, and choices, thereby enhancing their participation in daily activities and social interactions.

AAC systems can be categorized into unaided and aided forms. Unaided AAC includes gestures, facial expressions, eye gaze, and sign language, while aided AAC includes picture communication boards, communication books, symbol-based systems, tablets, and speech-generating devices. The selection of an AAC system depends on the child's cognitive abilities, motor skills, communication needs, and environmental factors.

In children with cerebral palsy and developmental delay, AAC intervention typically begins with the development of pre-linguistic skills such as eye contact, joint attention, turn-taking, and communicative intent. Picture symbols and communication boards are often introduced to help the child make requests, answer simple questions, and participate in social interactions.

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As communication skills improve, more advanced AAC systems can be incorporated to support vocabulary growth and sentence formation.

Research has demonstrated that AAC does not hinder speech development; rather, it facilitates language acquisition, increases communication opportunities, reduces frustration, and promotes independence. Family involvement and consistent AAC use across home, school, and therapy settings are critical for successful communication outcomes. Therefore, AAC serves as an essential component of speech-language intervention for children with cerebral palsy and developmental delay, enabling them to achieve functional communication and improve their overall quality of life.

3. METHOD

Patient Information and Clinical Background

Prisha Bharti, a 5.5-year-old female child, was referred for speech-language evaluation due to significant delays in communication and developmental functioning. She had been previously diagnosed with Cerebral Palsy associated with Intellectual Disability and Speech-Language Developmental Delay. The caregiver reported concerns regarding delayed speech and language development, poor interaction abilities, feeding difficulties, reduced communicative intent, and delayed developmental milestones. Additional concerns included impaired oral motor functioning, poor attention during activities, and limited play and imitation skills.

At the time of evaluation, the child demonstrated severe deficits in both receptive and expressive language abilities relative to her chronological age. Informal observations revealed poor eye contact, reduced social engagement, decreased communicative attempts, and limited responsiveness to verbal and environmental stimuli. The child also exhibited difficulty sustaining attention during structured activities and showed minimal participation in interactive play.

Oral Peripheral Mechanism (OPM) examination revealed impaired oral motor functioning characterized by reduced coordination and control of articulatory structures, which contributed to feeding and speech-related difficulties. Feeding concerns included poor oral coordination and reduced efficiency during eating activities. Furthermore, the child demonstrated poor pre-linguistic abilities, including reduced joint attention, limited imitation skills, decreased vocalization, and inadequate communicative intent.

Assessment Procedures

A comprehensive speech-language assessment was conducted to evaluate receptive and expressive language abilities, pre-linguistic skills, oral motor functioning, attention, play behavior, feeding skills, and social interaction abilities. Clinical observation, caregiver interview, and developmental language assessment procedures were utilized during evaluation. Assessment findings indicated that both receptive and expressive language abilities were functioning at an approximate developmental age level of 9–10 months. Pre-linguistic abilities were significantly affected, with reduced eye contact, poor joint attention, limited imitation, and minimal communicative attempts observed during interaction.

Attention skills were assessed using Reynell's attention framework, and the child demonstrated characteristics consistent with Level 2 ("Rigid") attention, wherein the child could attend to

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self-selected activities but demonstrated difficulty tolerating interruption or redirection by another individual.

The child also exhibited affected oral motor functioning and feeding difficulties, along with poor play interaction and limited engagement in structured communication activities. Overall assessment findings suggested severe delay in communication and interaction abilities secondary to Cerebral Palsy and associated Intellectual Disability.

Intervention

An individualized speech-language intervention program was planned according to the child's developmental, communicative, and cognitive profile. Therapy sessions focused primarily on improving communication abilities, enhancing pre-linguistic skills, increasing interaction, and promoting functional participation in daily communication activities.

The major therapy goals included improving receptive and expressive language abilities, enhancing communicative intent, developing joint attention and imitation skills, improving attention during structured tasks, facilitating oral motor functioning, and promoting functional communication within naturalistic environments. Additional focus was placed on improving play behavior and caregiver-mediated communication interaction.

Several evidence-based intervention approaches were incorporated into therapy sessions. Play-based therapy techniques were used to encourage interaction, engagement, and communicative participation. Joint attention training activities were implemented to improve shared attention and responsiveness to communication partners. Modelling and imitation-based strategies were utilized to facilitate language acquisition and increase communicative attempts.

Language stimulation activities, functional communication tasks, and Augmentative and Alternative Communication (AAC) strategies were incorporated to promote receptive and expressive language development in meaningful contexts. AAC-based approaches such as gesture use, visual cues, picture-supported communication, and structured choice-making activities were utilized to enhance communicative intent and functional interaction. Sensory and interactive play activities were also introduced to improve participation, attention, and social engagement. Parent counselling and home-based communication training formed an integral component of intervention, and caregivers were educated regarding strategies to facilitate communication stimulation and carryover of therapy goals in daily routines.

Results

Following regular and structured speech-language intervention, gradual improvement was observed across communication, interaction, and pre-linguistic domains. Post-therapy findings demonstrated improvement in receptive and expressive language abilities from the 9–10 month developmental level to approximately the 12–14 month level.

Noticeable improvement was observed in pre-linguistic skills, which progressed from poor to fair–good levels. The child demonstrated improved eye contact, better joint attention, increased responsiveness during interaction, and enhanced participation in play-based activities. Imitation abilities also improved, with the child showing increased ability to imitate gestures, sounds, and simple communicative behaviors during therapy sessions.

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Increased vocalization and communicative attempts were observed following intervention. The child also demonstrated improved attention during structured therapy activities and better interaction with communication partners. Mild improvement in feeding abilities and oral motor coordination was additionally reported.

AAC-supported intervention facilitated increased communicative attempts and improved participation during therapy activities. The child demonstrated better use of gestures, improved response to visual communication supports, and increased initiation of interaction during structured and play-based tasks.

Despite the persistence of developmental delays relative to chronological age, measurable gains were achieved in communication and interaction abilities following intervention. These findings suggest that individualized speech-language therapy combined with caregiver participation contributed positively toward the child's communicative and functional development.

4. DISCUSSION

The present case study highlights the importance of early and structured speech-language intervention in children with Cerebral Palsy associated with Intellectual Disability and Developmental Delay.

The child initially demonstrated severe delays in receptive and expressive language abilities along with deficits in pre-linguistic skills, oral motor functioning, and social interaction. Intervention strategies including play therapy, imitation training, language stimulation, modelling, and joint attention activities contributed positively toward communication development.

Improvement from a receptive and expressive language age of 9–10 months to 12–14 months reflects positive therapeutic outcomes. Enhancement in eye contact, joint attention, imitation, and communicative attempts also supported better social interaction and functional participation.

These findings are consistent with previous literature suggesting that caregiver involvement, early intervention, and individualized therapy planning significantly improve communication outcomes in children with developmental disabilities (Pennington et al., 2004).

Parent counselling and home-based communication stimulation played an important role in facilitating skill generalization beyond therapy sessions. Although developmental delays remained relative to chronological age, measurable improvement was observed following intervention.

Incorporation of AAC strategies contributed positively toward enhancing functional communication and communicative participation. Previous literature suggests that AAC interventions can support language development and improve interaction abilities in children with severe motor speech and developmental impairments. The use of visual and gesture-based supports in the present study appeared to facilitate communicative intent and social engagement during therapy sessions.

5. CONCLUSION

The present case study demonstrated gradual improvement in communication, pre-linguistic abilities, interaction, and oral motor functioning following structured speech-language therapy intervention in a child with Cerebral Palsy and Intellectual Disability.

Individualized intervention planning, caregiver participation, and regular therapy sessions contributed significantly toward therapeutic progress. Continued intervention and home-based stimulation are recommended to further improve functional communication, social participation, and developmental outcomes.

6. CLINICAL IMPLICATIONS

1. Early speech-language intervention is essential for children with Cerebral Palsy and developmental disabilities.
2. Pre-linguistic skills should be targeted before higher language goals.
3. Parent-mediated communication strategies enhance therapy outcomes.
4. Multidisciplinary rehabilitation is important for holistic management.
5. Functional communication approaches improve participation in daily activities.

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