



Indian Family of Cerebral Palsy

Voluntary Organization dedicated for the welfare of the people with cerebral palsy since 1993

Speech Problems in Children with Cerebral palsy

IFCP had published articles on squint and immature retina written by Dr BV Rao and Dr Subhadra Jalia respectively in previous issues. These articles created tremendous awareness regarding prevention or worsening of visual problems. In the series of such articles, herewith IFCP is publishing an article on another associated problems seen often in children with cerebral palsy. This article would educate the readers about normal speech generation and how it becomes abnormal following damage to immature brain i.e. in children with cerebral palsy. The important reason to publish this article is to help parents to understand speech therapy which IFCP would publish in coming issues. Kindly refer IFCP Vol.5, No.1 for an article on normal development of speech.

Children with cerebral palsy manifest a high incidence of speech and communication disorders. The difficulties the children with cerebral palsy have in generating an intelligible speech is described currently by the term DEVELOPMENTAL DYSARTHRIA.

What is developmental dysarthria?

Developmental Dysarthria has been described as a disability in producing the speech due to some dysfunction of the neuromotor or neuro muscular systems or both. The severity of the developmental dysarthria depends on the severity of the involvement of the speech producing musculature.

What are the important systems involved in speech production?

Speech is a complex physiological process. It involves integration of various systems. The entire process involves the five principle systems :

- 1.The respiratory system consisting of the lungs, ribcage, diaphragm and the windpipe
- 2.The phonatory/laryngeal system - consisting of the larynx or the voice box and the thin vibrating membrane or the vocal folds
- 3.The resonatory system - consisting of the nasal cavity and the velopharynx
- 4.The articulatory system - consisting of the oral cavity and the lips, tongue, jaw, palate etc
- 5.The central nervous system

How is speech produced?

The respiratory system provides the basic air supply for generating the sound.

The air pushed from the lungs to the vocal tract during exhalation causes the vibration of the vocal folds in the larynx/voice box and generates the voice.

The voice, thus generated is further modified into different speech sounds by the configuration of the articulators

The velopharynx either joins or separates the oral and nasal cavities so that the air passes through the oral or nasal cavities, and adds the resonance quality to the speech sounds.

This entire process is controlled by the nervous system. Impairment in any of these systems may result in an inability to produce adequate speech.

What are the different types of speech abnormalities?

1. Respiratory problems

Children with cerebral palsy generally demonstrate several abnormal breathing patterns including

- * Poor breath support
- * Reduced vital capacities
- * Irregular breath groups and inappropriately rapid rates
- * Reverse breathing groups and asynchronous movements of the muscles involved in breathing.

As a result of the abnormal breathing patterns, the children may speak at the end of exhalation portion of a breathing cycle, result in in short, choppy speech.

Or, they may have long pauses at inappropriate times while talking. These problems, in turn, affect the rate and prosody of speech.

Additionally, these children may have difficulties in coordinating breathing with phonation.

2. Laryngeal/phonatory problems :

Attempts to phonate by a child with cerebral palsy may result in several different types of phonatory disorder such as

- * Difficulty in initiating phonation due to spasm that holds the vocal folds together
- * Phonation of weak intensity
- * Harsh voice quality due to spasm that prevents the vocal folds from coming together
- * Strained and strangulated voice due to excessive laryngeal tension
- * Hard glottal attacks
- * Tremulous voice
- * Breaks in phonation

- * Fluctuations in loudness
- * Restricted pitch and loudness range

3. Resonatory Problems :

Children with cerebral palsy having developmental dysarthria exhibit poor velopharyngeal port functioning resulting in hypernasality or hyponasality.

Hypernasality occurs when an excessive amount of air passes into the nasal cavity during the production of sounds other than the nasal sounds like/m/n/ng

Hyponasality results when there is a reduced amount of air passing through the nasal cavity even when producing the normal nasal sounds.

4. Articulatory problems :

The children with cerebral palsy frequently have a delayed or deviant articulatory patterns which interfere significantly with speech intelligibility. This happens because articulation requires rapid, coordinated movements of the tongue and lips, in conjunction with normal breathing and phonatory processes. Although the specific articulation problems are directly related to the type of cerebral palsy and more precisely to the site of neurological damage, the severity of the motor dysfunction influences the severity of the articulatory impairment.

Some general patterns of disordered movements of the lips, jaws, and tongue of the children with cerebral palsy are :

- * Immobility of lips, with restricted lip retractions and protrusions
- * Open mouth with drooling
- * Slow jaw movements
- * Restricted tongue movements
- * Poor vegetative functions of sucking, swallowing biting, chewing, blowing
- * Inability to build adequate intraoral breath pressure
- * Difficulty in producing certain class of speech like/t/d/ch/jh/s/she and back sounds like k/g/etc. The speech sounds may either be omitted, or distorted or substituted.
- * The intelligibility of speech may be poor in connected speech utterances than in isolated syllable or word productions.

Thus, there is no one pattern of speech disability in children with cerebral palsy should begin as early as possible in order to capitalize on the developmental period when the speech and language learning is naturally quite rapid. Readers to Note : IFCP invites questions and comments on this article

IFCP will publish articles on simple methods to improve speech dysfunctions in the next issues.

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