Speech Functions in Preschool Children with Cerebral Palsy: Clinical Measures and Acoustic Analysis


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Aim
Language and speech disorders are one of the associated impairments in children with cerebral palsy (CP). This study investigated the speech functions in children with CP of different motor severities using clinical measures and acoustic analysis.

Methods
We collected speech samples from 16 children with CP having language ability greater than 3 years and 13 typically developing (TD) children. The participants’ ages ranged from 4 to 6 years. Children with CP were classified into two groups, Level I and Levels II-IV, based on the Gross Motor Function Classification System (GMFCS). Children with CP underwent the assessments of Percentage of Correct Consonant (PCC) and Preschool Language Scale-Revised (PLS-R). All speech samples were submitted to acoustic analyses for measures of the frequencies of the first two formants (F1 and F2) of corner vowels, voice onset time (VOT) of voiced and voiceless consonants, and percentage of affricate and fricative burst spectrums and nasality.

Results

- Children at Levels II-IV were had a significantly lower average PCC score.
- No significant difference between the mild and severe groups in all of the PLS-R subtest scores.
- Some acoustic measures were significantly different between children at Levels II-IV and children at Level I and TD children.
- Besides, the F1 of vowels, VOT of voiced consonants, and Antiresonscnces of nasality were significantly different between children at Level I and TD children.

Conclusion
Children with CP of various motor severities were found to vary in motor speech performance while showing similar language skills. These findings suggest the motor speech functions in children with CP may be related to the severity of gross motor impairment.