

Imprecise Vowel Articulation in Down Syndrome: An Acoustic Study

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Abstract : Individuals with Down syndrome (DS) have relatively better expressive language compared to other individuals with intellectual disabilities. Reduced speech intelligibility is one of the major concerns of this group of individuals due to their anatomical and physiological differences. The study investigated the vowel articulation of Malayalam speaking children with DS in the age range of 5-10 years. The vowel production of 10 children with DS was compared with typically developing children in the same age range. Vowels were extracted from 3 words with the corner vowels /a/, /i/ and /u/ in the word-initial position, using Praat (version 5.3.23) software. Acoustic analysis was based on vowel space area (VSA), Formant centralization ratio (FCR) and F2i/F2u. The findings revealed increased formant values for the control group except for F2a and F2u. Also, the experimental group had higher FCR, lower VSA, and F2i/F2u values suggestive of imprecise vowel articulation due to restricted tongue movements. The results of the independent t-test revealed a significant difference in F1a, F2i, F2u, VSA, FCR and F2i/F2u values between the experimental and control group. These findings support the fact that children with DS have imprecise vowel articulation that interferes with the overall speech intelligibility. Hence it is essential to target the oromotor skills to enhance the speech intelligibility which in turn benefit in the social and vocational domains of these individuals.

Keywords : Down syndrome, FCR, vowel articulation, vowel space

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