

Benefit of using hearing devices in tone perception of hearing-impaired children

*** Lee, K.Y.S., * van Hasselt, C.A. and #Chiu, S.N.**

**Division of Otorhinolaryngology, Department of Surgery, The Chinese University of
Hong Kong, Hong Kong*

#Department of Mathematics, Hong Kong Baptist University, Hong Kong

Objective

In tone languages like Cantonese, a change in tone denotes a change in the lexical meaning. This study aims at investigating the functional benefit of using hearing devices in assisting tone perception in children with various degrees of hearing impairments.

Subjects

83 Cantonese-speaking subjects (mean age = 4;11) with mild to profound hearing loss were categorized into 5 hearing loss groups.

Methods

The tone test consisted of 9 items on the three basic Cantonese tone-contrasts of high level, high rising and low falling tones. Subjects having assistive devices had to perform the test twice – once with the device being switched off and the second time with them on. Stimuli were calibrated recorded speech. Subjects responded to the stimuli by pointing at the corresponding pictures. A score of ‘1’ was awarded to each correct response.

Results

Tone scores decrease with increasing hearing loss both in the aided and unaided conditions. Mean scores in the aided condition (range = 0.58 – 1.00) are higher than that under unaided condition (range = 0.50 – 0.83) in all hearing loss groups. The improvement in tone perception reach statistical significance in the severe loss group (p-value = 0.037) but not in all the other four groups. Hearing aid and cochlear implant users showed no significant difference in the tone score both in the unaided and aided conditions (p-value = 0.19 and 0.46).

Conclusion

The use of hearing devices improves the tone perception performance of hearing-impaired children. With the use of hearing aids, children with mild and moderate hearing loss are able to perceive tones as normal hearing children do. Improvement in tone perception is especially marked in the severe hearing loss group while that in the profoundly loss group is unremarkable. The use of hearing devices, both the conventional hearing aids and cochlear implants, is still unsatisfactory in assisting the profoundly hearing-impaired children for functional tone perception.