Normal development of voice in children: Advances in the evidence-based standard

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The child voice in trained (voice conscious) boys and girls was investigated with phonetograms (voice range profiles) and fundamental frequency (F0) in running speech while reading a standard text. The methods were based on: (1) developmement and evaluation of the function of phonetograph 8301 made by the firm Voice profile, and (2) combined electroglottographic and stroboscopic examination of the movements of the vocal folds in speech. The voice analysis was compared with measurements of: (1) pubertal stages in youngsters and (2) hormonal analysis of all androgens and in girls, also estrogens. The phonetograms (voice range profiles) measured total pitch and loudness range and an area calculation was made of measured semitones×dB (A). The electroglottographic single cycles were stable and 2,000 consecutive electroglottographic cycles were measured in 48 boys and 47 girls, aged 8-19 years, to measure fundamental frequency in a reading situation. Individual and average phonetograms (voice range profiles) for sopranos, altos, tenors and bassos were examined. Statistical analysis was made with BMDP on the partly stratified cohort, partly prospective studies. The yearly change of voice range profiles showed a correlation to total serum testosterone of r=0.72 in boys, and serum estrone of r=0.47 in the girls. Single observations of the fundamental frequencies showed that total serum testosterone over 10 nmol l-1 serum represented values for a boy with a pubertal voice. The voice parameters were analyzed in 47 girls. F0 was related to estrone r=-0.34 ($p<0.05$) only. The increase of estrone and of fundamental frequency range (F0 range) had a predictive value ($p<0.05$) for the fall of F=from 256 to 241 Hz in puberty.

Speaker Biography

Mette Pedersen defended her PhD in Oulu University (Finland) based on her research at Gentofte Hospital, Denmark in 1997. Currently, she is working as an ENT Specialist at The Medical Centre, Voice Unit, Østergade 18, Copenhagen. She has by invitation, been Member of the European Union of Phoniatricians since 1976 and from 2011 been Honorary Member of Pacific Voice and Speech Foundation.

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