

Medical rehabilitation

Effects of Auditory Rehabilitation Program and Language Skills on Pulmonary Function of Deaf Adolescents with Cochlear Implants

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The precise neural mechanism responsible for language skills of children with congenital or prelingual deafness is still not well understood, but it has been suggested that the regulation of breathing during articulation as well as respiratory system efficiency might be important. Therefore, the purpose of the study was to analyze the effects of auditory rehabilitation program and language skills on pulmonary function of deaf girls and boys with and without cochlear implants.

Methods: Static and functional spirometric evaluations were performed in 72 prelingually deaf and in a control group of 48 adolescents with normal hearing. All deaf participants exhibited hearing loss of above 80 dB and were divided into two groups, ie., those with cochlear implants (CI; the Nucleus 22-electrode CI) and without cochlear implants (non-CI). Language skills and spirometric variables of CI subjects participated in individual auditory rehabilitation program were compared to those of non-CI participants.

Results: ANOVA revealed significant influence of deafness on forced vital capacity (FVC) ($F=4.0$; $p<0.05$) and forced expiratory flow values FEF_{25-75} , ($F=3.9$; $p<0.05$). The deaf girls and boys with CI had significantly higher maximal expiratory flow values compared to deaf subjects without CI ($p<0.05$). Use of oral communication correlated positively with forced vital capacity ($r= 0.41$; $p <0.01$). **Conclusions:** The sensory deprivation of prelingually deaf adolescents affects the function of the respiratory system. The auditory rehabilitation therapy and use of oral communication seem to have beneficial effects in the control of speech breathing, presumably by the reduction of airflow resistance, an increase expiratory flow values.

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