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ADANO-Sitzung: Adult Hearing Screening.

## Main effects of ARHL: peripheral and central changes

A. Ernst

Dept. Otolarynology at ukb (Berlin)

Age-related hearing loss (presbycusis) is a disease entity which is characterized by a cochlear (i.e. peripheral) hearing loss (degeneration of sensory cells) with a progressive decline of pure-tone audiogram thresholds, together with a poorly understood central processing impairment of varying degrees. Central presbycusis must be regarded as an underrated factor responsible for the break-down in interhuman communication in the elderly. This often leads to social isolation, retreat and subdepression (Hickson et al. 2007). This deprivation from auditory information can also be associated with cognitive dysfunction and - in some cases - with age-related dementia. The central manifestation of presbyacusis is characterized by deficits in the processing of auditory information in the auditory pathways; these deficits can be detected by late auditory evoked potentials (N1/P2) and – more specifically - psychoacoustic tests directed towards the neural architecture of the central auditory pathway. Epidemiological studies show, however, that the risk of developing a central presbycusis is increased by 4 – 9 % per year of age (beginning around 55 yrs) with a prevalence in men. As evidenced by the Blue Mountains Hearing Study (Golding et al. 2006), males are approximately twice as likely as females to develop a central presbycusis. The highest prevalence of central presbycusis is in the age group of 80+ with a striking 95 % prevalence. Even if they have a sufficient tonal hearing sensation, they cannot understand complex acoustic stimulus patterns (language, music), particularly if perceived in a noisy environment. The underlying mechanisms of central presbycusis are supposed to be a decline in neuronal processing speed and in timing of afferent integration. Furthermore, a loss of inhibitory control and spatial memory was found as the result of progressive deafferentiation. Recently, it was shown by LIPP testing in a large 80+ sample that interaural frequency and signal duration discrimination at low test frequencies was significantly elevated which indicates a deterioration of time- and phase-dependent processing at brain stem and cortical levels (Freigang et al 2011). The influence of congenitally acquired cochlear neuron characteristics in this process is presently discussed (Hinojosa and Nelson 2011).