

279. THE OTOACOUSTIC EMISSIONS AS A BY-PRODUCT OF THE COCHLEAR AMPLIFIER AND THEIR ROLE IN HEARING SCREENING.

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Introduction: The normal ear does not just receive sound; it also, paradoxically, produces low-intensity sounds called otoacoustic emissions(OAEs). Otoacoustic emissions are sounds of cochlear origin, that are caused by the motion of the cochlea outer hair cells, as they respond to auditory stimulation, during an active process that is called the cochlear amplification of sounds. When sound stimulates the cochlea, the outer hair cells vibrate, and then produced vibrations are transmitted backwards through the middle ear to the eardrum that produces a nearly inaudible sound. Otoacoustic emissions can be recorded by a microphone fitted into the ear canal, and provide a simple, efficient and non-invasive objective indicator of healthy cochlear function.

Propose and objectives:To highlight some aspects of hearing mechanisms, especially the cochlear amplification of sounds and the role of outer hair cells in this process. Also to underline the importance of otoacoustic emissions in assessment of cochlear function, and early diagnosis of congenital hearing loss in newborns.

Materials and methods: There were analyzed the results of the last scientific works and discoveries in the field of hearing mechanisms, especially the role of outer hair cells in cochlear amplifier, hearing diseases that can appear in destruction of this mechanism, and diagnosis methods.

Discussion results: Experimental measurements of basilar membrane vibrations within the postmortem and in the living cochlea demonstrate the difference between these, with a greater improved sensitivity and sharpness of tuning in the living cochlea. That means that the basilar membrane vibrates more in a living cochlea than in a dead cochlea. This property is called the cochlear amplifier, and is generated by the cochlear outer hair cells electromotility and stereociliary active bundle movements. In process of cochlear amplifier are produces a by-product called otoacoustic emissions. Detectable OAEs is produced by motions of the eardrum which are extremely small. Usually this sounds are an unstable volume between -30 dB and +30 dB sound pressure level. OAEs allow to appreciate the cochlear function, especially in congenital hearing loss, when the early diagnostic is very important.

Conclusion: The cochlear amplifier play a great role in auditory sensitivity, and permit improved frequency discrimination. Without the cochlear amplifier, the traveling wave gradually reaches a peak, and then rapidly declines. The indicator of normal cochlear amplifier mechanism is the presence of otoacoustic emissions, which can be recorded and used as a diagnostic method - hearing screening, a very important tool in early diagnosis of congenital hearing loss in newborns or in diagnosis of other hearing diseases.

Key Words: otoacoustic emissions, cochlear amplifier, outer hair cells, hearing screening.