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Ototoxicity of Loop Diuretics. Morphological and Electrophysiological Examinations in Animal Experiments
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Inner ear sensitivity to toxic side effects of various drugs has been known for more than a century. According to J. E. Hawkins, ototoxicity is “the tendency of certain therapeutic agents and other chemical substances to cause functional impairment and cellular degeneration of the tissues of the inner ear, and especially of the end organs and neurons of the cochlear and vestibular divisions of the eighth cranial nerve”.

The ototoxic effect of aminoglycosides has been studied very carefully since it became evident, shortly after its use in humans (1945), that it could produce deafness and balance disorders. Heretofore little was known about the ototoxic effects of “loop inhibiting” diuretics such as ethacrynic acid and furosemide. Since the first published report about immediate but reversible sensorineural hearing loss combined with vestibular symptoms following intravenous administration of ethacrynic acid, many years passed until the underlying pathophysiologic mechanisms were clarified to some extent. Fundamental questions still remain open, but C. Hommerich makes a successful attempt to present an overview on the current understanding of ototoxicity resulting from use of loop diuretics and to clarify prevailing concepts of endolymph production in the cochlea.

New aspects of cochlear mechanics followed the discovery by Kemp that the cochlea not only receives sounds, but also produces acoustic energy referred to as acoustic emissions. R. Probst presents an overview on this finding based on the results of personal experimental studies in animals and humans and discusses the biological significance of this phenomenon. Moreover, he emphasizes the clinical significance of otoacoustic emissions which now permit examination and monitoring of basic cochlear mechanisms in an objective and noninvasive way.

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