

[Audiol Neurotol.](#) 2007;12(3):145-54. Epub 2007 Jan 25. **Short-term pathophysiologic changes and histopathologic findings of the auditory pathway after closed head injury, using a rabbit model.**



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Abstract

Hearing impairment is a well-known consequence of closed head injury (CHI). The aim of this study was to elucidate the pathogenesis of CHI-induced hearing loss, using a rabbit model. Twelve New Zealand white rabbits were divided into two groups of 6. In the first group, CHI was induced mechanically, whereas the rabbits of the second group served as controls. Baseline distortion product otoacoustic emissions (DPOAEs), contralateral suppression (CS) of the DPOAEs and auditory brainstem response (ABR) were obtained.

The same measurements were performed in the first group after CHI. Three hours later, the animals were sacrificed and their brain was excised and subjected to histopathologic

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examination. Mean I-III ABR latencies were increased and DPOAE amplitudes and CS values were reduced in the trauma group after CHI, at a statistically significant level.

Histopathologic examination of the temporal lobe and brainstem showed multiple hemorrhagic and necrotic areas, with edema in the surrounding region. The vestibulocochlear nerve was severely damaged at its emerging site at the brainstem. In conclusion, both peripheral and central involvement of the auditory pathway was found after CHI. Otoacoustic emissions in conjunction with ABR may provide significant information on both peripheral and central auditory function.