Portable media players associated with short-term hearing effects

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Temporary changes in hearing sensitivity are associated with potential harmful effects of listening to an MP3 player, according to a report in the June issue of *Archives of Otolaryngology-Head & Neck Surgery*.

"It is well known that excessive occupational noise exposure can lead to noise-induced hearing loss," the authors write as background in the study. The increasing popularity and availability of portable music players has caused concern about the potential hazardous effects on hearing. "Excessive noise exposure can lead to metabolic and/or mechanical effects resulting in alterations of the structural elements of the organ of Corti [the inner ear organ in mammals that contains auditory sensory cells or 'hair cells']. The primary damage is concentrated on the outer hair cells, which are more vulnerable to acoustic overstimulation that inner hair cells."

Hannah Kempler, M.S., of Ghent University, Belgium, and colleagues studied 21 participants who were exposed to pop-rock music in six different sessions using two types of headphones at multiple preset settings of the MP3 player. The study included a noise exposure group consisting of ten men and 11 women (age 19 to 28) who listened to pop-rock music for one hour. A second control group consisted of 14 men and 14 women, also age 19 to 28 years.

All participants in the noise exposure group listened to an MP3 player for a maximum of six sessions at varying volume levels, using two separate types of headphones. These tests were designed to study the

short-term effects on the auditory system of young adults listening to an MP3 player for one hour. Hearing in both groups was evaluated before and after one hour, using two measurements; one that studied sounds emitted in response to an acoustic stimuli of very short duration and one that studied sounds emitted in response to two simultaneous tones of different frequencies.

Researchers found significant changes between pre-exposure and post-exposure measurements using one set of criteria, but did not find much difference when using the second set. The authors also noted that "significant threshold or emission shifts were observed between almost every session of the noise exposure group compared with the control group."

The authors conclude that, "the development of a permanent threshold shift cannot be predicted from the initial temporary threshold shift, but considering the reduction in hearing sensitivity after listening to a portable media player, these devices are potentially harmful. Further research is needed to evaluate the long-term risk of cumulative recreational noise exposures."

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