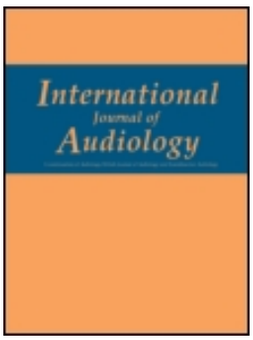

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Editorial

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Associate Editor

Young people: Their noise and music exposures and the risk of hearing loss

In the past two decades, the number of publications on the risk of acquired hearing loss among children and young adults has increased substantially. The introduction of MP3 players and a lawsuit that followed, which alleges that such devices pose a risk to the user's hearing, caught the general public's attention through news media coverage. While a decision in the case remains pending, this issue has brought widespread scrutiny to the question of potential risks to young people's hearing but relates to only one of many ways in which youths may be exposed to loud noise.

Sources of excessive sound exposure in children and youths are many, from toys, arcade games, music, and work. Data from Sweden found the presence of the audiometric high frequency notch in groups as young as ten years old (Axelsson et al, 1981; Costa et al, 1998). Sound pressure levels of toys have also been documented, and several countries have adopted sound level labels, to alert consumers of the risk.

The global process of urbanization has reduced the number of children working on farms worldwide. However, young people continue to be employed in that industry, as well as in other industries. The proportion of children working, as well as their work conditions and legal protections, varies from country to country.

But social and economic changes, the new personal music devices, and the perception of ever increasing intensity levels during concerts and at nightclubs has made music exposure the most studied source of excessive sound exposure to children and youths in several countries. New products and organizations have been created with the goal of reducing hearing risks (hearing loss and tinnitus) due to music exposure.

The term music-induced hearing loss is now used for a condition akin to noise-induced hearing loss. Both noise- and music-induced hearing loss are characterized by a notch in the 4000 to 6000 Hz region of the audiogram, are linked to a chronic, extended exposure, and progress at a rate proportionate to exposure conditions. But noise is defined as an unwanted sound, whereas music is often quite the opposite. Numerous publications have reported an elevated prevalence of music-induced hearing disorders, primarily among musicians. Other studies have examined other professionals exposed to music, attendees of discos or concerts, and users of personal listening devices.

Still, not all evidence available confirms increased risk with increasing exposures, and the possibility of a toughening protective effect of such exposures has even been suggested (Fleisher and Muller, 2005). A study of ten thousand people conducted in Germany reported that orchestra musicians, despite their exposure, had the best hearing thresholds among several occupations and non-exposed groups (Fleisher and Muller, 2005). Moreover, in the 18-to-25-year-old group un-exposed to occupational noise only a minimal difference (not statistically significant) was seen between people who regularly go to discotheques and those who have never been there. Similar findings were reported for Walkman users (Mostafapour et al, 1998).

Rabinowitz et al (2006) examined whether the hearing status of young US adults has worsened over the past 20 years by comparing yearly prevalence of hearing loss in the baseline audiograms of 2526 individuals ages 17 to 25, beginning employment between 1985 and 2004. The prevalence of high frequency hearing loss decreased over the twenty-year period, while the prevalence of audiometric 'notches' remained constant. Their results suggest that despite concern about widespread recreational noise exposures, the prevalence of hearing loss among a group of young US adults has not significantly increased over the past two decades. Is it too soon to detect the effects of more recent technology? Possibly yes, since the findings from the study do not demonstrate any systematic, measurable effect on entrance audiograms.

On October 19 and 20, 2006 the first ever conference on 'Noise-Induced Hearing Loss in Children at Work and Play' took place in Covington, Kentucky, USA. It was partially funded by a grant from the National Institute for Occupational Safety and Health (NIOSH) and jointly sponsored by NIOSH, the National Institute on Deafness and other Communication Disorders, the National Hearing Conservation Association, the Marion Downs Hearing Center, the Oregon Health and Science University, and the University of Northern Colorado. (http://www.hearingconservation.org/conf_childrenconf.html).

The sub-themes of the conference reflected the work being done internationally. They included:

1. Current risk characterization of both noise and music exposure specific to children and adolescents;
2. Comparative vulnerability of the auditory system in different age groups;
3. Behaviors and attitudes that influence risk and could impact prevention efforts;
4. Alternative interventions to control exposure and risk of hearing loss.

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While additional work is needed to better characterize the hearing risks facing children and young people, consensus was reached at the conference that surveillance of these populations is necessary as well as controlling their exposures. Some advocate regulations such as those found in countries like Australia, Switzerland, Italy, Austria, Finland, and Sweden which have specific recommendations for occupational exposure limits when it comes to musical activities or noise in the entertainment industry. All agreed with the need for further research and public health interventions such as exposure assessment and control, education, and audiometric testing targeted to children and youths.

In 2006, the Cochrane Review published a review of interventions to promote the wearing of hearing protection (El Dib et al, 2006). Only two studies met their rigorous criteria for inclusion in the report; and of these, the one successful intervention was a four-year school-based hearing loss prevention program for students working on their parents' farms (N = 753). The intervention group was twice as likely as the control group (which received only minimal intervention) to wear some kind of hearing protection. This evidence suggests that long term school-based programs can effectively increase the use of hearing protection among students, and sheds some light on approaches that ought to be considered for increasing awareness of the value of hearing and means of preventing disorders.

Disclaimer

The findings and conclusions in this presentation are those of the author, and do not necessarily represent the views of the National Institute for Occupational Safety and Health.

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