

# Turn Down That Radio! Years Of Loud Noise May Lead To Tumor

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New research suggests that years of repeated exposure to loud noise increases the risk of developing a non-cancerous tumor that could cause hearing loss.

“It doesn't matter if the noise comes from years of on-the-job exposure or from a source that isn't job-related,” said Colin Edwards, a doctoral student in the School of Public Health at Ohio State University.

In the current study, people who were repeatedly exposed to loud noise over the span of several years were on average one-and-a-half times as likely to develop this type of tumor compared to people who weren't exposed to such noise on a regular basis.

The tumor, called acoustic neuroma, grows slowly and symptoms typically become noticeable around age 50 or older. Of the 146 people with acoustic neuroma in this study, nearly two out of three were 50 or older.

An acoustic neuroma tumor slowly presses the cranial nerve that is responsible for sensing sound and helping with balance. Symptoms include hearing loss and a constant ringing in the ears, or tinnitus.

The study is currently in the online advance access edition of the American Journal of Epidemiology. The study will also appear in the February 15 printed edition of the same journal.

Edwards and his colleagues gathered four years of data from the Swedish portion of the INTERPHONE Study, an international study of cell phone use and tumors that affect the brain and head.

The researchers used the Swedish portion of the study because health officials there keep meticulous data on rates of acoustic neuroma development in the country's population, said Judith Schwartzbaum, a study co-author and an associate professor of epidemiology in the School of Public Health at Ohio State .

In addition to the 146 study participants with acoustic neuroma, another 564 people without the tumor who served as controls were also interviewed by a nurse. The participants in this group were randomly selected from the continuously updated Swedish population registry. Study participants ranged in age from 20 to 69.

All participants were asked if they were regularly exposed to occupational and non-occupational loud noise and, if so, for how many years. “Loud noise” was defined as at least 80 decibels – the sound of city traffic.

If the subjects said that they had been regularly exposed to loud noise, they were then asked to describe the activities during which they were exposed to that noise.

Categories for loud noise exposure included: exposure to machines, power tools and/or construction noise; exposure to motors, including airplanes; exposure to loud music, including employment in the music industry; and exposure to screaming children, sports events and/or restaurants or bars.

The researchers also collected data on the use of hearing protection.

The two types of loud noise posing the highest risk of acoustic neuroma development were exposure to machines, power tools and/or construction (1.8 times more likely to develop the tumor) and exposure to music, including employment in the music industry (2.25 times more likely to develop the tumor.)

Exposure to motors, including airplanes increased acoustic neuroma risk by 1.3 times, while regular exposure to screaming children, sports events and/or bars and restaurants increased the risk by 1.4 times.

The number of years that a person was exposed to any category of loud noise also contributed to the development of acoustic neuroma. Just five years of regular exposure to loud noise increased the chance that a person would develop acoustic neuroma by one-and-a-half times.

“It's not surprising that the longer that people are exposed to loud noise, the greater their chances become for developing the tumor,” Edwards said.

The study results also suggest the importance of wearing ear protection when exposed to loud noises. People who reported that they protected their ears from loud noise had about the same risk of developing acoustic neuroma as people who were not exposed to loud noise. People who protected their hearing were also half as likely to develop acoustic neuroma as people who didn't wear ear protection.

The tumor is fairly rare, accounting for only about 6 to 10 percent of tumors that develop inside the skull. Depending on the population, anywhere from one to 20 people per 100,000 develop acoustic neuroma each year. The people with the tumor in this study had the most common type – unilateral acoustic neuroma. About 95 percent of all cases of acoustic neuroma affect only one ear. The other kind, bilateral acoustic neuroma, is inherited and affects both ears.

If the tumor is caught early enough through a thorough examination and hearing tests, a physician may be able to surgically remove it. But as the tumor grows larger, it may become attached to the nerves that control facial movement, balance and hearing, making it far more difficult to remove the entire tumor.

Edwards and Schwartzbaum conducted the study with researchers from the Institute of Environmental Medicine of the Karolinska Institutet in Stockholm, Sweden.

Source: Ohio State University

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