Exposure to loud noise and risk of acoustic neuroma

The incidence of acoustic neuroma has increased over the past 20 years and is currently 1–20 per million population per year in most industrialized countries [1]. This increase in incidence may be due to better diagnostic tools and increased awareness of the disease; however, a number of environmental factors including electromagnetic fields emitted by hand-held cellular telephones have also been implicated [2]. More recently, the role of loud noise exposure in acoustic neuroma aetiology has been evaluated by Edwards et al. [3]. Prior to this, the only available study examining loud noise exposure and acoustic neuroma risk was in the 1980s and was limited by the small number of cases available for inclusion in the analysis, as well as by the restriction of the study population to men [4].

As a secondary aim of the Swedish portion of the Interphone Study (an international multicentre case–control study of brain tumours, acoustic neuromas and parotid gland tumours in relation to mobile phone use and other potential risk factors) [5], Edwards et al. evaluated the role of loud noise exposure as a potential acoustic neuroma risk factor.

The study was a population-based case–control study that included all individuals aged 20–69 years who resided in three geographic regions covered by the three regional cancer registries in Sweden. Eligible cases were all patients diagnosed with acoustic neuroma (using International Classification of Diseases, Tenth Revision, and International Classification of Diseases for Oncology, Second Edition) over a 3-year period. Controls were randomly selected from the study base and were frequency matched on age, sex and residential area. A total of 146 cases with acoustic neuroma and 564 controls were included in the study.

Data collection was by means of face-to-face interviews conducted by either a study nurse or the study neuropsychologist, and study participants were specifically asked about occupational and regular non-occupational exposure to loud noise (exposure to loud noise being defined as that exceeding a level of 85 dB).

The total years of loud noise exposure were then categorized into <5, 5–14 and ≥15 years. Loud noise exposure was also categorized into the following groups:

(i) exposure to machines, power tools and/or construction;
(ii) exposure to motors, including airplanes;
(iii) exposure to loud music, including employment in the music industry;
(iv) exposure to screaming children, sports events and/or restaurants or bars and
(v) other types of loud noise exposure.

Data regarding the use of hearing protection were also collected.

Unconditional logistic regression models adjusted for age, sex and local cancer registry region were used to estimate odds ratios (ORs) and their respective 95% confidence intervals (CIs). In the analysis of loud noise exposure type, adjustments were also made for highest level of education as a proxy for socio-economic status. Tests for trend were calculated by use of the Cochran–Armitage test for trend.

The results revealed that individuals reporting loud noise exposure from any source were at increased risk for acoustic neuroma (OR = 1.55, 95% CI = 1.04–2.30). Exposure to loud noise from machines, power tools and/or construction increased the risk for acoustic neuroma (OR = 1.79, 95% CI = 1.11–2.89), as did exposure to loud music (OR = 2.25, 95% CI = 1.20–4.23). The OR for a latency period of 13 or more years since the first loud noise exposure from any source was 2.12 (95% CI = 1.40–3.20).

Edwards et al. concluded that the result of the study supports the hypothesis that loud noise exposure is a risk factor for acoustic neuroma; however, further research is needed to validate self-reports of loud noise exposure and to evaluate the effect of potential detection bias.

Dipti Patel
e-mail: dipti_p_patel@hotmail.com

References