ABSTRACT

Introduction: Young people are increasingly exposed to loud music, especially in leisure activities. Certain environments and even the headphones can cause high sound pressure levels which can damage the hearing system.

The idea that hearing loss from exposure to noise is linked only to adults (elderly) or that is peculiar to occupational factors should be reassessed. It has been observed that young people with hearing loss have audiograms with noise exposure characteristics.

SUBJECTS AND METHODS

The EOAE was conducted by using Otoacoustic emissions evoked by transient and by distortion product in 134 subjects, 268 ears. The scans were analyzed according to the criterion “pass / fail” and the parameters amplitude of the signal and the signal / noise ratio were evaluated. Simultaneously, the subjects answered a survey on the use of headphones, and their use was recorded. The variables studied were: amplitude of the signal / noise ratio, gender and age. For the prevalence analysis we applied chi-square test (Fisher’s exact test). The statistical significance level was set at 4% (p=0.05).

For the analysis of TEAOD, we considered normal or “PASS” the amplitude results equal to or greater than -12 and the signal / noise ratio equal or greater than 6 dB in all six (6) tested frequencies (2 KHz - 12 KHz). For DPOAE we considered normal or “PASS” amplitudes when the mean signal / noise ratio equal or greater than 0 and signal / noise ratio equal or greater than 0.28 at all (6) tested frequencies (2 KHz - 12 KHz). The test was declined as “fail” when both TEAOD and DPOAE showed changes in at least one ear.

RESULTS

It was observed that, 80.6% out of 134 participants had abnormal TEAOD, mostly makes (χ²=2,247, p=0.03) while 57.6% showed abnormal DPOAE. There was no statistical difference between genders (p=0.289, chi-square test). Seven nine percent had both, TEAOD and DPOAE, at least in one ear, mostly were males (p=0.002). There were 1/2 of people who had altered ears at both ears, mostly were males (p=0.002).

The evaluation of failures observed in TEOAE showed a tendency to concentration of failures in higher frequencies. The largest number of failures occurred at a frequency of 4 kHz (Figure 4).

Analyzing, signal / noise ratio, the gender factor had a statistically significant relevance (F> M, F1, 132 = 24.008, p <0.001), women had better outcomes than men. In the laterality factor, there was significant difference between the mean amplitude of the right and left ears (F1, 132 = 7.136, p = 0.009). The amplitudes were greatest on the right ear.

The analysis of the amplitudes of the signal, the gender factor had a statistically significant difference (F> M, F1, 12 = 6.280, p = 0.013) The women had better results than men. The test side also had a significant effect (F1, 132 = 5.801, p = 0.017). The mean amplitude recorded on the right ear was significantly greater than the left ear (F1, 132 = 4.598, p = 0.034).

The prevalence of abnormalities was studied. Women had better outcomes than men (F> M, F1, 132 = 14.380, p <0.001) (Figure 3). Regarding the failures observed in DPOAE, there was also a statistically significant concentration of failures in higher frequencies, and the largest percentage of failures occurred in 8 and 12KHz frequencies in both ears (Figure 6).

CONCLUSIONS

Young people who took part in this study showed signs of changes in outer hair cells. This could indicate an early cochlear dysfunction, and as a significant number of participants reported being exposed to loud music, it is possible this might be causing these cochlear changes. There were significant differences in relation to gender. The male individuals are more likely to show changes of outer hair cells.

REFERENCES


2. Barros SMS, Frota S, Atherino CCT, Osterne F. The efficiency of otoacustic emissions evoked by transient and by distortion product in 134 subjects, 268 ears. The scans were analyzed according to the criterion “pass / fail” and the parameters amplitude of the signal and the signal / noise ratio were evaluated. Simultaneously, the subjects answered a survey on the use of headphones, and their use was recorded. The variables studied were: amplitude of the signal / noise ratio, gender and age. For the prevalence analysis we applied chi-square test (Fisher’s exact test). The statistical significance level was set at 4% (p=0.05).

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Young people who took part in this study showed signs of changes in outer hair cells functioning. This could indicate an early cochlear dysfunction, and as a significant number of participants reported being exposed to loud music, it is possible this might be causing these cochlear changes. There were significant differences in relation to gender. The male individuals are more likely to show changes of outer hair cells.

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