



Safe Listening Practices and Sound Induced Hearing Loss

Vibhuti*

Department of ENT, SwarnVaidya Clinic, India

*Corresponding Author: Vibhuti, Department of ENT, SwarnVaidya Clinic, India.

Received: September 30, 2024

Published: October 01, 2024

© All rights are reserved by Vibhuti.

Noise (Sound) induced Hearing Loss is an irreversible but preventable type of SNHL, which occurs due to exposure to sufficiently high level of sound and length of time in recreational or occupational setting resulting in neural degeneration of inner ear. It is based on the principle that the total effect of sound is proportional to the total amount of sound energy received by the ear, irrespective of the distribution of that energy over time. Noise trauma thus depends on intensity and duration of exposure. It causes widespread and continuous physical and mental health implications. It can lead to TTS (Temporary Threshold shift) or PTS (Permanent Threshold Shift), Tinnitus; CAD, Hypertension, MI, Sleep disturbances, Perceived Stress, Reduced Mental health and Quality of life. Post exposure Tinnitus and TTS are warning signs of impending permanent NIHL. With regular exposure to loud or prolonged noise, the sensory cells and other structures become permanently damaged. PTS may occur due to loss of outer hair cells at basal turn followed by degeneration of Auditory nerve fibres; Noise induced mechanical destruction or metabolic decompensation may also lead to damage to organ of corti.

NIHL is usually bilateral and symmetrical, although Asymmetrical or Unilateral (Left ear predominantly) NIHL may also occur but warrants consideration of retrocochlear lesions. Cochlear Synaptopathy may occur if post synaptic terminals are damaged resulting in Hidden Hearing loss which may not be detectable by routine audiometry tests. Synaptic repair can occur in 5 days but hair cell damage remains and functional recovery of threshold continues for longer. Initially, NIHL may only affect high frequency range. It leads to difficulty in speech comprehension especially in noise, degraded hearing quality, distortion of sounds with lack of clarity, difficulty telling sounds apart, tinnitus and hyperacusis resulting in a negative impact on the individual's quality of life. OAE and High Frequency Audiometry is more sensitive to diagnose early NIHL.

Acoustic trauma, on the other hand, occurs due to single exposure to intense sound causing immediate Hearing loss due to hair cell and dendritic damage.

WHO estimates that about 1.1 billion young people worldwide could be at risk of hearing loss as a result of unsafe listening practices. Among teenagers and young adults aged 12–35 years in middle- and high-income countries: nearly 40% are exposed to potentially damaging sound levels in recreational venues such as nightclubs, discotheques, and bars; and nearly 50% face the risk of hearing loss due to listening at high volumes or for prolonged time periods over their personal audio systems.

To prevent this, WHO-ITU has laid global standard (2022-2024) safe-listening practices that shall promote the enjoyment of amplified music while reducing the risk of permanent hearing injury. It is recommended that personal audio devices and systems be used at a weekly limit of 1.6 Pa²h (Pascal squared hours) per 7 days as the reference exposure, which is equivalent to 80 dB for 40 hours a week. It is suggested to use PLD at a volume where one can hear the surrounding sounds Or at levels up to 60% of maximum volume for a total of 60 minutes a day.

For susceptible individuals, additional precautions recommend include use of Well-fitted, Noise cancelling, larger headphones; Use of well fitted, custom made, hearing protection devices viz. highfidelity earplugs, earmuffs, helmets, canal caps; Promoting use of built-in or external speakers; Limiting exposure to noise before and after exposure to allow sensory hair cells to recover; to Limit time spent engaged in noisy activities; Monitoring of sound levels through the apps.

In WHO noise quality guidelines, the values are summarized with regard to specific environments and for the onset of health effects from noise exposures.

Custom-molded earplugs work by physically attenuating the intensity of the sound and hence it is reasonable to expect that short-term protection immediately after exposure translates to long-term protection against sound-induced hearing loss. Applications like Hear-WHO, NIOSH Sound Level Meter (SLM) app, Hearing Health app help monitor sound levels and effect on hearing.

Conclusion

Evidence suggests that over-exposed ears age more quickly than non exposed ears. Safe listening practices should be encouraged to reduce the incidence of NIHL. This also includes the development and implementation of evidence- based policies and regulations on the part of governments, the adoption of sound-control measures by venue operators and events professionals, develop policies against unnecessary honking, change of honking culture, cooperation and education of performers, technicians, and sound engineers; use of ear protection devices, creating public awareness about the detrimental effects of Sound induced Hearing loss and Safe Listening practices especially among young children.