

Raise Voice against Noise

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Abstract

The whole world is alarmed at air, water and land pollution. But there's a deafening silence about noise pollution. Be it human or machine-created, noise disrupts normal activity and balance of life. Noise-induced hearing loss (NIHL) is the most common cause of sensorineural hearing loss (SNHL). NIHL is one of the most common workplace disorders and the second most self-reported occupational injury. Exposure to noise can be occupational or nonoccupational. Government and regulatory bodies have fixed the permissible limit of sound levels. Noise control laws are openly violated. It is the time that the public and authorities should awake against the danger of noise pollution. They should strictly enforce the noise control laws. Noise-induced hearing loss is 100% preventable, but once you have hearing loss, you'll have it for life.

Keywords: NIHL; Noise Pollution; Hearing Loss.

The word noise is derived from the Latin word "nausea" meaning impulsive, unwanted, and unpleasant. We hear different forms of pollutions like water pollutions, air pollution and soil pollution but it is very less often we have heard about noise pollution. Noise pollution can be defined as any unwanted electromagnetic signal that produces a jarring or displeasing effect and which interferes with human communication, comfort and feeling of well-being. We may get some idea about the severity of this detrimental effect from the fact that in China, till third century B.C., instead of hanging men for dangerous crimes, noise was used for their torturing.¹ Noise-induced hearing loss (NIHL) is the most common cause of sensorineural hearing loss (SNHL). NIHL is one of the most common workplace disorders and the second most self-reported occupational injury. In US alone, thirty million workers are at risk for NIHL, and 22 million American adults ages 20-69 already have it. Forty-four percent of carpenters and 48% of plumbers report having a hearing loss. By the age 25, the average carpenter has the same hearing as a 50-year-old person who does not work

around hazardous noise [2].

Some common sources of this noise pollution are road traffic, industries, railway and air traffic and use of heavy generator. Increasing noise pollution is a big threat to the health and fitness of the people, if the noise pollution is allowed to go unchecked it may rob the people of their hearing capacity. Hearing impairment cannot be seen and hence its effects are not visible to others, so deaf suffers in silence. Unlike blindness, deafness often provokes ridicules rather than sympathy [3].

Exposure to noise can be occupational or nonoccupational. Increasing number of vehicles on the roads, rising growth of factories, construction work, loudspeakers used on various occasions, rock and pop music, etc. are various factors responsible for causing noise pollution.

Government and regulatory bodies have fixed the permissible limit of sound levels [Table 1]. The government has fixed a limit of 55 db maximum for residential areas during daytime and 45 db maximum during nighttime, which unfortunately is followed

more in the breach than in practice. A citizen has a right to complain about noise that disturbs him. Police could lend a helping hand to shut down

loudspeakers beyond 10 p.m. or warn a boisterous party going on next door. Noise control laws are openly violated.

Table 1: Permissible limits of sound

Areas	Day (d B)	Night (d B)
Industrial area	75	65
Commercial area	65	55
Residential area	50	45
Sensitive areas upto 100 metres around hospitals, educational institutions.	50	40

Noise exposure can cause two kinds of health effects. These effects are non- auditory effects and auditory effects. Non- auditory effects include stress-related physiological and behavioral effects, and safety concerns. Auditory effects include hearing impairment resulting from excessive noise exposure and tinnitus. Noise-included permanent hearing loss is the main concern related to occupational noise exposure [2].

Exposure to sound above a level of approximately 85 dB initially manifest as a temporary hearing loss or dullness of hearing that is known as temporary threshold shift (TTS), which may have fast resolution within first 10-15 days of the exposure. However, a repeated or sustained exposure of noise to the inner ear hair cells and associated nerve fibers leads on to degenerative changes and the TTS becomes permanent threshold shift (PTS). The effect of excessive noise could be so devastating that it can cause permanent memory loss or psychiatric disorder. There are many hypothesis that include mechanical injury from basilar membrane motion, metabolic exhaustion, activity induced ischemia and ionic poisoning from breaks in the cell membrane.

Noise-induced hearing loss is 100% preventable, but once you have hearing loss, you'll have it for life. Exposure to harmful sounds causes damage to the sensitive structures of the inner ear. These structures can be injured instantly from an intense, brief impulse, such as the explosion of a firecracker, or gradually from continuous exposure to noise, such as in a woodworking shop [2].

The National Institute of Occupational Safety and Health has issued guidelines about the amount of time you can be exposed to different noise levels safely. If the level of noise in your workplace averages 85 dB, you are at risk for NIHL after 8 h of exposure. If the average level of noise is 88 dB, you are at risk after only 4 h of exposure. Thus, every increase of 3 dB beyond 85 dB reduces safety hours by half. Remember - the greater the noise level, the less time before hearing damage can occur. Moshamer and colleagues in a study concluded that the overall effect of noise on hearing depend on the frequency and

intensity of sound, numbers of years of exposure as well as individual susceptibility [4]. Recent studies showed that Noise Induced Hearing Loss occurred over a duration of 7-8 years [5,6,7].

The audiologic profile of NIHL is the presence of sensorineural hearing loss that is most pronounced in the high-frequency region between 3,000 Hz and 6,000 Hz of the audiogram, and the greatest amount of hearing loss is typically around the 4,000-Hz region (i.e., 4,000 Hz dip) known as 4 kHz notch or Aviators notch [8].

Noise pollution is the most dreadful health hazard because of its insidious nature and some irreversible damage to the important structures of human body. A wide range of health hazards are resulted from noise pollution, ranging from deafness, tinnitus, hypertension, disturbed sleep, anxiety, psychiatric disorder, permanent loss of memory to difficulties in communication and even impediment in cognitive development in children. Among all the damaging effects on health, hearing loss is a major concern. The hearing loss from prolonged exposure to a certain degree of noise resulted from injury to the delicate sensory and neuronal components of the cochlea [10]. Noise is becoming an increasingly ubiquitous and unnoticed form of pollution even in the developed countries. Although it is a slow and subtle hazard to health, very little earnest attempts have been made to improve the same. We as health care professional are also at peril with certain specific situations like the utterance crowd of patients in OPD's, continuous beep of monitors in operation theater and ICU, the noise of suction machine and even of the drilling done by orthopedic, dental and ENT surgeons. Here I would like to mention another strong factor of injudicious use of loud speaker in the mosque/temples and religious/political gatherings. Another comparative cross sectional study done in stone crushing industry, the subjective hearing loss involved 21.5% of the individuals as compared to 2.8% of the control group [5]. So keeping all this in view, the dire need of the time is to make the people aware that noise is a pollutant, followed by to pick the cases early, before the irreversible

damage to hair cells has occurred. For this the best option available is the serial audiometeries of the high risk population. Moreover certain preventive measure are of paramount importance including sound level detectors and protecting devices like ear plugs. Health education and mass campaign has a prime role to overcome this pollution. Special emphasis must be given to those industrial/ factory workers who are also at risk with other ototoxic agents like tobacco and certain drugs. They are more prone to the detrimental effects of noise pollution because of their synergistic action. Long term follow up of these individuals will unmask the value of intervention done [5].

Traffic noise is one of the sources of noise that affects a householder. He/she has little control over such man-made noise, except taking certain steps to minimize the effect of noise inside. Plants outside, where possible, could cut some of the noise. Blinds and drapes on windows could further act as barriers. It is rare to see a construction, which has proactively taken steps to install noise-reducing steps such as fixing foam boards and other sound absorbing materials inside or outside the walls. That applies to windows, which could have a frame outside that could absorb or deflect sound. A floor could have sound absorbing materials coated to minimize noise when someone walks on it. Sound absorbing material could be fixed inside or outside at strategic locations which could minimize the external noise effect. That applies to noise deflectors, such as barriers and plants that could deflect noise if it is from any specific location.

Noise generated inside a house is rarely recognized by someone who has been living along. He/she fails to appreciate the fact that the noise level is high and could have long-term deleterious effects such as loss of hearing or other effects on the human body due to prolonged exposure to noise. There are a few sources of noise inside a house – TV, music system, air-conditioner, washing machine, refrigerator, microwave and so on.

Loss of hearing is one health hazard which one recognizes when it's too late [9]. Personal stereos and cellphones should be used with caution, preferably at reduced sound levels or with hand-held devices and that too sparingly.

For the prevention of NIHL the interventional studies also need to involve appropriate control subjects. For keeping the inner ear sensorineural structures safe from the unwanted effects of noise, the use of hearing protective devices is the simple method. Professional health workers must be religiously involved in "hearing health" of at risk

noise exposed individuals and should do concerted efforts to make it certain that noise pollution are minimized both during professional hours and relaxation periods by adapting the measures to reduce the excessive noise level as well as prompt use of Hearing Protection Devices (HPDs), when appropriate.

Honking by motorists is the largest source of noise pollution in the world. Relentless and unnecessary honking assaults our senses every day and is a major cause of road rage, anxiety, hypertension and sleep disorders. It is important that our authorities take note of this issue and take some serious steps to rid our cities of this menace. Indian Medical Association (IMA), Association of Otolaryngologists of India (AOI) & Awaaz foundation (Mumbai) have taken a National Initiative against Noise Pollution as NISS (National Initiative for Safe Sound). In an effort to end the menace of unnecessary honking, NISS celebrated April 26th, 2017 as "No Horn Day" in the country .

The whole world is alarmed at air, water and land pollution. But there's a deafening silence about noise pollution. Be it human or machine-created, noise disrupts normal activity and balance of life [11]. There is a dismal requisite to break the silence of emerging menace of noise pollution and achieve a noise free environment. The time has come that the intensity of the issue is properly identified by the health professionals, ordaining and law implementing bodies [12].

It is the time that the authorities should awake against the danger of noise pollution. They should strictly enforce the noise control laws. The noise producing factories located in the residential areas should be shifted to far-off places without any delay. The use of loudspeaker should be stopped after specific time. Above all, public needs to be aware and cooperative against the danger of noise pollution because without public cooperation authorities cannot make much difference. Lastly and more importantly is to create public awareness about the issue and involve the media to focus the matter.

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