



Hearing Loss in Tractor Drivers of Central India

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Noise is one of the critical occupational problems, which affect the tractor drivers' health and safety. Exposure to noisy environment for longer duration results in hearing loss of the individuals. To conduct the audiometric profile, 60 healthy male subjects of similar age, height and weight were selected and divided into two groups of 30 subjects each viz. tractor drivers with more than 10 years of experience and office workers as controls. The audiometric testing of both the ears of the selected subjects was conducted at frequencies of 0.125, 0.25, 0.5, 1, 1.5, 2, 3, 4, 6 and 8 kHz. The hearing threshold levels of office workers at audiometric test frequencies did not exceed 25 dB (A) to cause hearing handicap. However, it exceeded 25 dB (A) for tractor drivers (>10 years of experience). Statistical analysis of the data revealed significant difference in audiometric profile of the tractor drivers in comparison to the office workers. The results indicated that long term and continuous exposure to noise from the tractor was the principle cause of the poor audiometric status of the tractor drivers. It was also concluded that the occupational hazards of tractor driving significantly increased the hearing threshold levels of drivers as compared to office workers.

Introduction

Noise and vibration are the two critical occupational hazards, which affect the tractor driver's health and safety. Extended exposure to noisy environment results in hearing loss of the individuals. Noise is affecting workers in every field i.e. manufacturing, construction, transportation, agriculture and the military as well as the general public in the society. High level noise not only hinders communication between the operators depending upon the level, quality and exposure duration of noise but also have physical, physiological and psychological effects on the operators. Noise causes irritation, annoyance and hearing loss. High intensity noise not only affects the ear permanently but also the overall health. High blood pressure, asthma, atherosclerosis, ulcers, neurosis, nervous breakdowns are some of the extreme consequences of such exposure.

There are three types of hearing loss. These are acoustic trauma, noise induced temporary threshold shift (NITTS) and noise induced permanent threshold shift (NIPTS). NITTS is the shifting of the threshold level towards upward due to high intensity sound for short duration. NIPTS is the threshold level shifted upward permanently due to prolonged exposure to sound. The PTS occurs first at 4 kHz and as the time of exposure progresses the hearing loss becomes more pronounced and spreads over a wider frequency range of 3-6 kHz. There remains no possibility of further recovery

from such damage. In this study, the hearing impairment of tractor drivers involved in agricultural operations in Bhopal district of India was estimated.

Materials and Methods

Sixty healthy subjects i.e. 30 tractor drivers and 30 office workers of similar age, height and weight group with no previous history of exposure to intense noise were randomly selected for the study from the villages in the vicinity of Bhopal district of Madhya Pradesh. The office workers selected in the study acted as control. Subjects were familiarized with the experimental protocol before the experimental data were collected. The pure tone audiometric (PTA) tests at ten different frequencies i.e. 0.125, 0.25, 0.5, 1, 1.5, 2, 3, 4, 6 and 8 kHz was done at Peoples College of Medical Sciences and Research Centre, Bhopal. Both the ears i.e. right ear and left ear were tested individually.

Results and Discussion

The variation of mean hearing threshold levels (dB) as a function of audiometric frequencies (kHz) for left and right ears of two groups of subjects is shown in Figure 1. It was observed that mean hearing threshold levels for tractor drivers were higher than those for office workers. The average of hearing threshold levels of office workers at the audiometric test frequencies of 0.5, 1, 1.5, 2 & 3 kHz did not exceeded 25 dB(A) to cause hearing handicap of both the ears. However, average hearing threshold levels exceeded 25 dB at the audiometric test frequencies of 3, 4, 6 and 8 kHz for both the ears of tractor drivers.

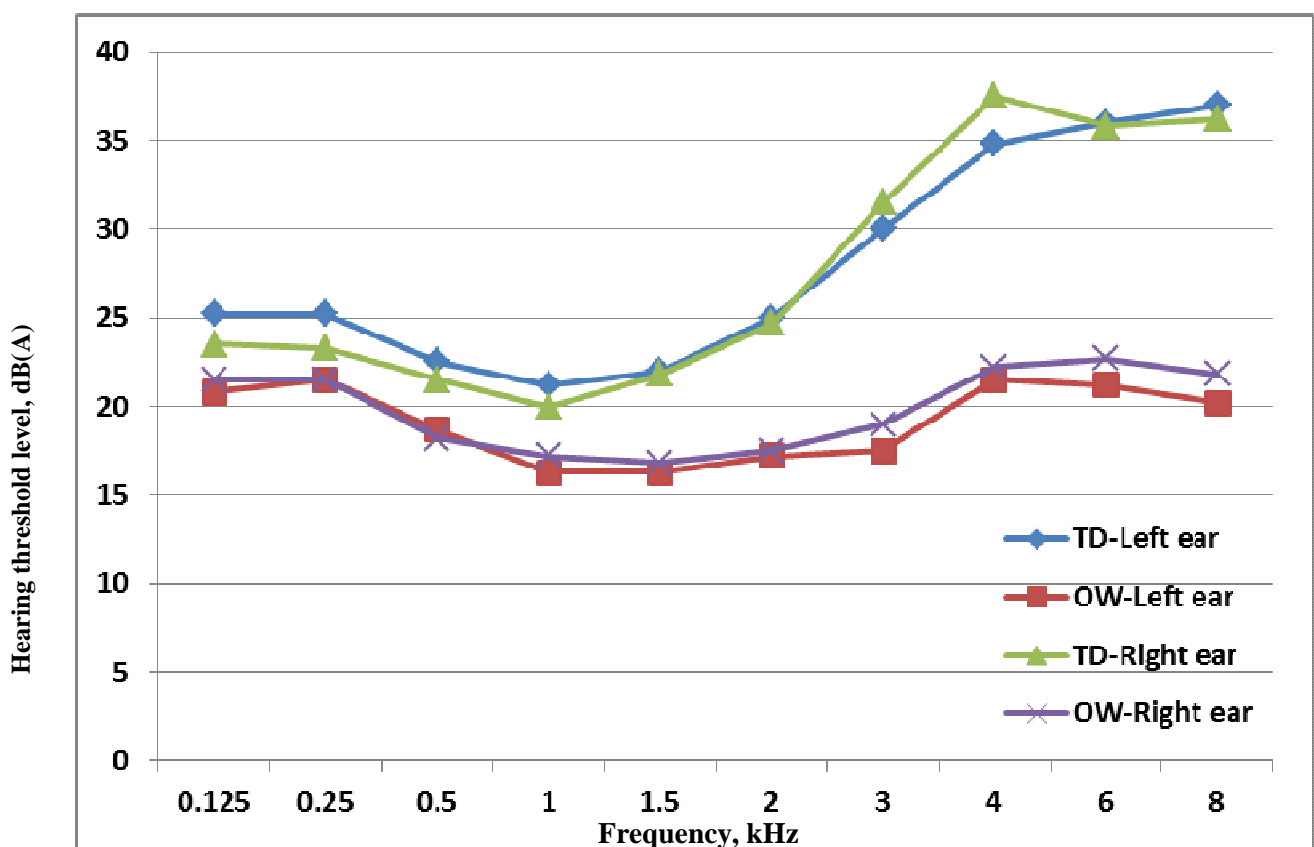


Fig 1. Hearing threshold level of Tractor Drivers (TD) and Office Workers (OW) at different frequency (kHz)

The two tailed 't' test results indicated that there is highly significant ($p < 0.001$) difference in auditory threshold values of office workers and tractor drivers at all frequency range for both ears. This indicated that tractor driving significantly affected the hearing threshold levels of drivers. Therefore, it was observed that the audiometric status of the tractor drivers was poor in comparison to the office workers. This may be due to their long term involvement to noisy environment throughout the day while working in agricultural field for number of years.

Conclusion

Form the study it was concluded that the audiometric threshold levels were higher for tractor drivers as compared to office workers (control group). The average hearing threshold levels of office workers (control group) at the audiometric test frequencies did not exceed 25 dB (A) to cause hearing handicap of both the ears. But, for the tractor drivers, the average hearing threshold levels exceeded 25 dB (A) to cause hearing loss. Therefore, it was concluded that the occupational hazards of tractor driving significantly increased the hearing threshold levels of drivers as compared to office workers.
