Main Article

Hearing Assessment and Noise-related Attitudes among Traffic Policemen of Puducherry

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ABSTRACT

Introduction

To determine the hearing loss and evaluate the noise-related attitudes among Traffic policemen of Puducherry.

Materials and Methods

A community-based cross-sectional observational study was carried out involving 76 traffic policemen aged 20 to 60 years, employed in and around Puducherry via convenience sampling , aimed at assessing attitudes related to noise and determine hearing loss through the Otoacoustic Emission test (OAE). Those individuals who exhibited OAE refer results were then further evaluated using a Pure Tone Audiometry.

Results

Out of 76 study participants, 69% were OAE pass and 31% were OAE refer. Out of 31% OAE refer, the prevalence of hearing impairment was 58.30% for mild, 29.10% for moderate and 12.60% for severe sensorineural hearing loss. Based on environmental measurements, 73.7% of participants were working in areas with daily noise exposure level of 85-90 decibels. Only 40% of study participants were aware of hearing protection measures, however majority expressed concern about the potential impact of noise on their health.

Conclusion

This study revealed that traffic policemen are at constant risk of noise-induced hearing loss (NIHL). Therefore, regular periodic hearing assessment needs to be done.

Keywords

Noise Induced Hearing Loss; Prevalence; Pure Tone Audiometry

Traffic policemen are at a heightened risk of exposure to noise pollution as part of their occupational hazard.[1] The streets of Puducherry are often characterized by high levels of noise from vehicular traffic and horns. This persistent exposure to noise can affect the hearing of traffic policemen. Moreover, their attitudes and perceptions regarding noise pollution can influence their overall well-being and job performance. Individual predisposition to noise-induced hearing loss varies.[9] The challenges faced by these individuals and understanding their perspectives on noise pollution is not much explored yet. The objective of my study was to determine the prevalence of hearing loss and evaluate the noise-related attitudes among traffic policemen of Puducherry.

Materials and Methods

This cross-sectional observational study was conducted

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in the Department of Otorhinolaryngology & Head and Neck Surgery between July 2023 to September 2023.

An Awareness programme was conducted for traffic policemen, in that programme, we recruited 76 traffic policemen aged 20-60 years working in and around Puducherry via convenience sampling. Institutional ethics committee approval was taken before commencing the study (NO.IEC/C-P/13/2023).

Fig. 1. Shows the methodology of the study

Descriptive statistics were used to summarize the demographic characteristics of the participants. Audiometric data were analysed to determine the prevalence of hearing impairment. The questionnaire responses were analysed to understand noise-related attitudes and awareness among traffic policemen. OAE screening was used as a first-line screening tool due to its portability, rapid testing capability and it does not require sound-proof room. Pure tone audiometry was reserved for those failed OAE to confirm and quantify the hearing loss. No psychological assessments were included in this study. Average daily noise exposure levels were objectively measured at the traffic junctions using a calibrated digital sound level meter. Measurements were recorded at peak traffic hours over a duration of 30 minutes per session on two separate weekdays to account for day-to-day variations at participant's work sites.

Following is a structured questionnaire which was used to assess the hearing and noise-related attitudes among Traffic policemen:

Questionnaire for hearing assessment & noise related attitudes among traffic policemen :

Name :

Age :

Gender :

Education :

Place of work:

Work experience in years :

Daily working hours :

Self Assessment of Hearing Status

CHARACTERISTICS	EXCELLENT	AVERAGE	POOR
QUALITY OF HEARING			
HEARING OVER PHONE			
HEARING IN CROWD			
QUALITY OF SLEEP			

Noise Related Attitude

	YES	NO
Do you feel uncomfortable to loud sounds?		
Do you experience disturbance in daily routine activities after work?		
Do you know that exposure to loud noise can lead to noise induced hearing loss?		

	YES	NO
Ever used ear plugs?		
Usage of other PPE?		
Do you ignore ear plug usage because of cosmetic stigma?		
Is using ear plug regularly difficult?		
Are ear plugs costly?		

Results

The mean age of the 76 study participants was 32.5 +/- 13.6 years.

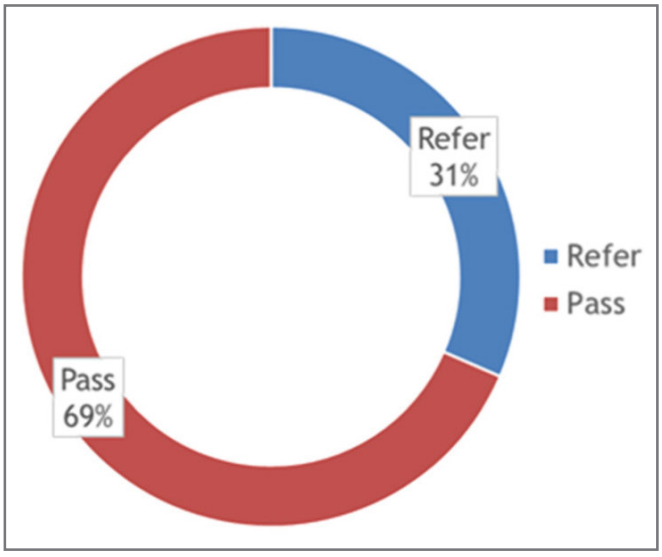

Fig. 2. OAE results of the study participants

Figure 2 shows that 69% were OAE pass and 31% were OAE refer.

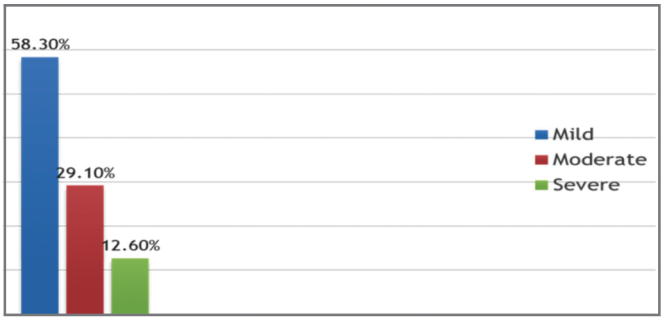

Fig. 3. Prevalence of Hearing Impairment in study participants

Figure 3 shows that out of 76 participants, 24 (31.6%) exhibited some degree of hearing impairment, as defined by the World Health Organization (WHO) criteria. The majority of cases were classified as mild (n = 14), followed by moderate (n = 7) and severe (n = 3) hearing impairment.

Based on the sound level meter results, the average daily exposure to noise in their work was assessed.

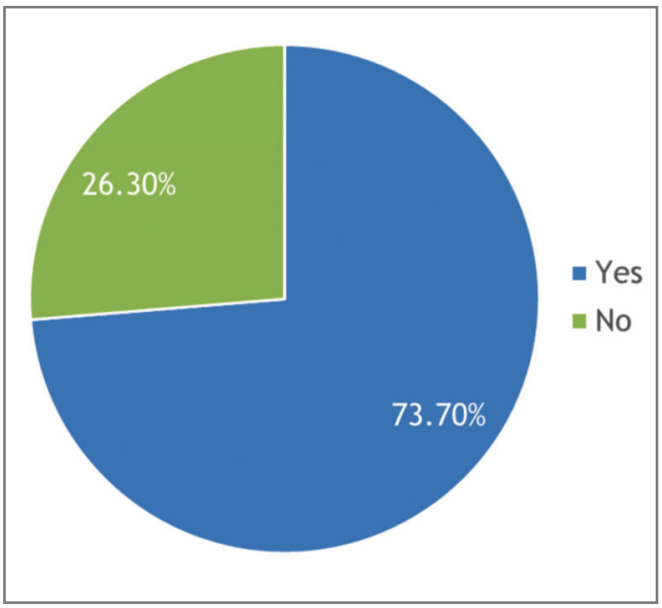

Fig. 4. Noise exposure levels of 85-90 decibels in study participants

Figure 4 shows that majority (n=56, 73.7%) reported daily noise exposure exceeding recommended limits, with an average noise level of 85-90 decibels. This exposure level was recorded using objective field measurements.

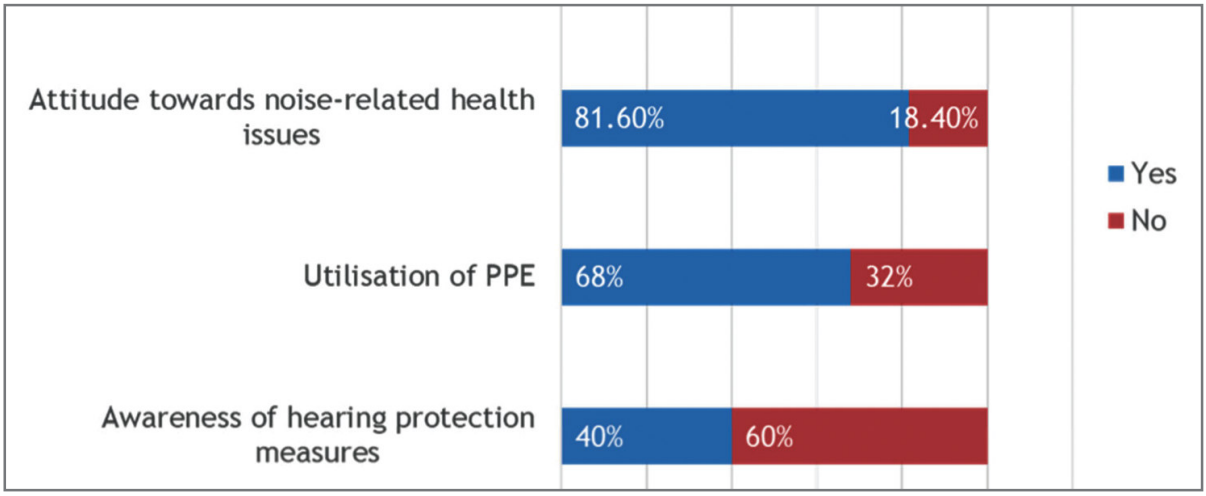

Fig. 5. Attitudes and Awareness of Noise-related health issues in study participants

The findings of attitudes and awareness regarding noise-related health issues are as follows (Figure 5) :

- Awareness of Hearing Protection measures: Only 40% participants were aware of hearing-specific protective measures, such as earplugs.
- Utilization of Personal Protective Equipment (PPE): 68% of participants reported using PPE in general which include non-auditory protective measures like high-visibility vests, gloves and masks, only a small subset of these reported using hearing-specific PPE, indicating a gap in awareness and targeted protection against occupational noise exposure.
- Attitudes towards Noise-Related Health issues: A majority of participants (n = 62, 81.6%) expressed concern about the potential impact of noise on their hearing health. However, a significant number (n = 14, 18.4%) did not consider noise related health risks a significant concern.

Depending upon the results, the participants were counselled regarding usage of hearing-specific PPE's, noise-related health issues and for further management, including hearing aid trial and fitting.

Discussion

A substantial proportion of traffic policemen (31.6%) exhibited some degree of hearing impairment, which is a cause for concern. Daily noise exposure levels exceeded recommended limits for majority of participants, indicating the high-risk nature of their work environment. Awareness of effective hearing protection measures was relatively low, and not all participants consistently used PPE.[1]

A study in China concluded that high frequency hearing loss was high in population exposed to occupational noise.[2] Noise-induced hearing loss still remains troublesome, despite public health awareness campaigns are conducted in developed countries.[3] WHO Environmental noise guidelines 2018 for the European region formulated specific recommendations (day and night time) for exposure of road traffic, railway noise, aircraft noise, wind turbine and leisure noise.[4]

Existing literature exhibits non-auditory effects like cardiovascular disorders, mental health effects, endocrine irregularities apart from auditory effects like hearing loss and tinnitus.[5] More than 25% of study population had auditory and non-auditory health effects of noise exposure. There has been evidence that smoking predisposes to noise-induced hearing

loss.[11] Miao L (2023) found that NIHL and hypertension was noticed in males aged >35 years and with duration of noise exposure >5 years.[12] Noise-induced hearing loss stays as a global burden and early detection of such hearing loss by periodic audiometric tests helps in early intervention.[6]

A Ghimire and SR Niraula (2015) found out that association exists between the duration of exposure and level of noise exposure. They also highlighted the fact that providing PPEs is not sufficient, periodic screening should be done to influence traffic policemen for regular usage.[7]

A study done by Sanju HK and Kumar P (2016) on traffic policemen and bus drivers showed that study participants had good quality of hearing but lack of awareness of noise-induced hearing loss and PPEs usage.[8]

A study conducted in Bangladesh highlights that tinnitus and hearing loss are reported among traffic policemen. Auditory morbidity is an alarming matter which should not be abandoned.[10]

Conclusion

This study revealed that traffic policemen are at constant risk of noise-induced hearing loss. Therefore, regular periodic screening for hearing assessment using the OAE test, may be implemented as part of the National Health Programme. Early detection and timely intervention by providing hearing-specific PPE needs to be done to prevent noise-induced hearing loss. A significant knowledge-practice gap was identified between general PPE usage and awareness of specific hearing protection measures, which calls for focused training interventions.

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