



Assessment of Self-Awareness and Subjective Prevalence of Noise-Induced Hearing Loss among Traffic Policemen in a Belgaum, India

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Abstract

Context: Noise-induced hearing loss is a major preventable occupational hazard with various ill-effects. We studied NIHL in the vulnerable traffic police-personnel, on Indian population in a growing city.

Aims: To find subjective prevalence of noise-induced hearing loss among traffic police-personnel using a structured questionnaire. To identify awareness of the ill-effects of noise pollution on hearing.

Settings and design a one-year community-based cross-sectional study, conducted in traffic police-personnel in Belgaum, from January-December 2019.

Materials and Methods: 80 male traffic police-personnel aged 18 yrs to 50 yrs included. The questionnaire had 17 questions regarding the self-assessment of traffic policemen about their hearing, exposure to loud sound, use of personal protective devices and the Smith hearing severity questionnaire.

Statistical analysis as the data analysis was carried out using SPSS and included calculation of percentages and proportions, application of the test of significance and chi-square test.

Results: Prevalence of NIHL was 56.25% based on the questionnaire and were categorized as mild, moderate and severe hearing loss in 35.56%, 53.33% and 11.11% of subjects respectively. Most participants rated no knowledge and use of any ear protection devices. Hearing loss was regarded as an important issue by majority. Among the participants, 20% already suffered from tinnitus. Only 11.25% used earplugs to protect their hearing.

Conclusions: The negative consequences of noise exposure are shown to be present among the subjects by this study.

Hence, there is a need to educate them about hazardous effect of noise exposure. Also, further studies for those the early detection and practicing preventive measures are pivotal.

Keywords: Noise-induced hearing loss; Traffic police-personnel; Smith's hearing severity score; Squamosal mucosal

Introduction

Noise-Induced Hearing Loss [NIHL] is the 2nd most prevalent a etiology for reduced hearing [1]. NIHL is irreversible but preventable occupational hazard [2].

Traffic noise has been increasing due to growing transportation and industrialization especially in developing countries like India. Occupational safety and health administration defined noise pollution as noise >85 dB for ≥ 8 hours [3]. NIHL is a high frequency SNHL. Traffic policemen are at constant exposure to this they need to be aware of noise pollution and its harmful effects [4].

Aims and objectives: Self-assessment of knowledge about noise-induced hearing loss, its harmful effects and protective to measures and to find subjective prevalence of NIHL.

Materials and Methods

80 male road traffic police personnel participated in the study.

Inclusion criteria

- Age group of 18 yrs to 50 yrs.
- Candidates who have noise exposure more than 8 hours a day for a period of six months or more.

Exclusion criteria

- Candidates with acute or chronic otitis media squamosal and mucosal.
- Congenital causes and those with family history of hearing loss.

- Traumatic causes of hearing loss including head trauma and ear surgery.
- Sudden sensory neural hearing loss.
- Candidates with history of ototoxic drugs and with any systemic illness and metabolic disorders causing SNHL.

Written informed consent from all participants. Detailed history and demographic details were collected from all the study subjects. Data collection by Interviewer-administered structured questionnaire regarding awareness, detailed medical history, occupational history, duration of exposure [5]. All traffic policemen were clinically examined including general physical examination, systemic examination, careful examination of the ear, nose and throat. Otoloscopic examination and tuning fork tests were performed.

The traffic policemen were asked to answer an interviewer-administered questionnaire which was translated to the regional language. The questionnaire included total of 17 questions, regarding the self-assessment of the policemen about their hearing ability, past and present exposure to loud sound and the use of personal protective devices such as earplugs and earmuffs.

In the questionnaire, 9 questions were of the Smith’s hearing severity questionnaire, to assess subjective prevalence of noise-induced hearing loss. Each question was scored on a scale of 0 to 3, where each point was the following; 0 point-never, 1 point-occasionally, 2 points-often and 3 points-almost always. The minimum score was zero and maximum score a person could obtain was 27. Score of 6-10 was categorized as mild hearing loss, 10-20 as moderate hearing loss and more than 20 as severe hearing loss.

Smith’s hearing severity questionnaire:

- Have you worked in noisy environment?
- Do you have trouble following the conversation when two or more people are talking at the same time?
- Do people complain that you turn the TV volume too high?
- Do you misunderstand some words in a sentence and need to ask people to repeat them?
- Do people get annoyed if you misunderstand what they say?
- Do you misunderstand what others are saying and make inappropriate responses?
- Do you have difficulty hearing when someone speaks in a whisper?
- Does a hearing problem cause you to have arguments with family members?
- Does a hearing problem cause you problem when listening to television or radio?

Other questions

- Do you perceive hearing loss?

Smith questions	Never	%	Present	Occasional	%	Often	%	Always	%
S1: Noisy environment work	0	0	1	0	0	0	0	80	100
S2: Trouble following conversation when 2 or more people talk?	34	42.5	0.575	17	21.25	23	28.75	6	7.5

- Do voices sound blurry, like people mumbling?
- Can u understand men’s voice better than women?
- Do you hear ringing in the ear?
- Do you have hypersensitivity to loud sounds?
- Do you have non-auditory symptoms?
- Do you use hearing protection aids like ear-plugs or ear-muffs?
- Do you have Knowledge about the auditory and non-auditory effects of NIHL?

Statistical analysis

Data were entered in excel spreadsheet by using numerical codes. Data analysis was done using SPSS. Chi-square test used for the analysis. p<0.05 will be considered statistically significant. Demographic characteristics and study variables will be analyzed using descriptive statistics. Means, standard deviations and ranges will be reported for continuous variables and percentages were reported for categorical variables.

Results

All the subjects were male. All 80 traffic police personnel worked for a minimum duration of 8 hours per day on road. Almost all road traffic police personnel were serving for a duration of more than 2 yrs. The mean age group is 36.84 ± 2.6 years.

The questionnaire response to each of the questions were as follows (Figure 1 and Table 1).

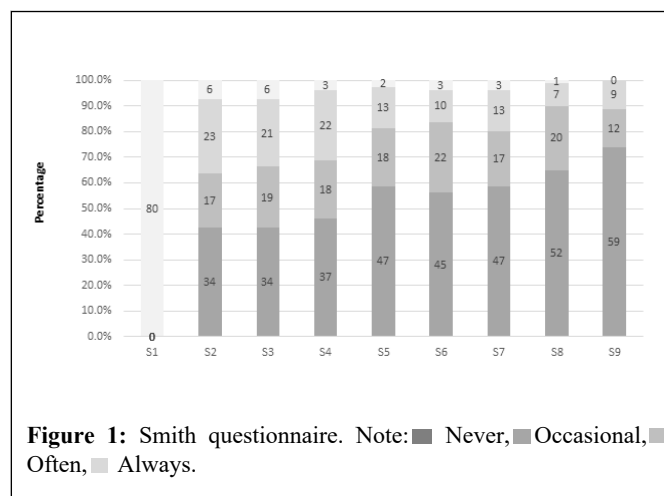


Figure 1: Smith questionnaire. Note: ■ Never, ■ Occasional, ■ Often, ■ Always.

S3: Turn TV volume high?	34	42.5	0.575	19	23.75	21	26.25	6	7.5
S4: Misunderstand words or ask to repeat?	37	46.25	0.5375	18	22.5	22	27.5	3	3.75
S5: Do people get annoyed?	47	58.75	0.4125	18	22.5	13	16.25	2	2.5
S6: Make inappropriate response due to misunderstanding?	45	56.25	0.4375	22	27.5	10	12.5	3	3.75
S7: Difficulty hearing whisper?	47	58.75	0.4125	17	21.25	13	16.25	3	3.75
S8: Cause family arguments	52	65	0.35	20	25	7	8.75	1	1.25
S9: Problem listening TV/ radio?	59	73.75	0.2625	12	15	9	11.25	0	0

Table 1: Smith questions wise responses of respondents.

All traffic police personnel reported working in a noisy environment. About 57.5% of the traffic police personnel had trouble hearing when two or more people talk at the same time. 57% of the drivers have faced people complaining about the volume of the T.V being high. As high as 53.75% of them misunderstood the words in conversation and have asked people to repeat them.

41.25% of the traffic police personnel have reported that people get annoyed if the people misunderstood what they said, while 43.75% of traffic police personnel misunderstood what other people say and intern make inappropriate responses, and 41.25% of them have reported having difficulty in hearing when someone whispers.

35% of the study subject reported having arguments with family members owing to their hearing problem. Meanwhile most of them [73.75%] said they had no problem while listening to T.V or radio.

Based on the score calculated from the responses of the questionnaire 53.33% had moderate hearing loss, 35.56% had mild and 11.11% had severe hearing loss (Figure 2 and Table 2).

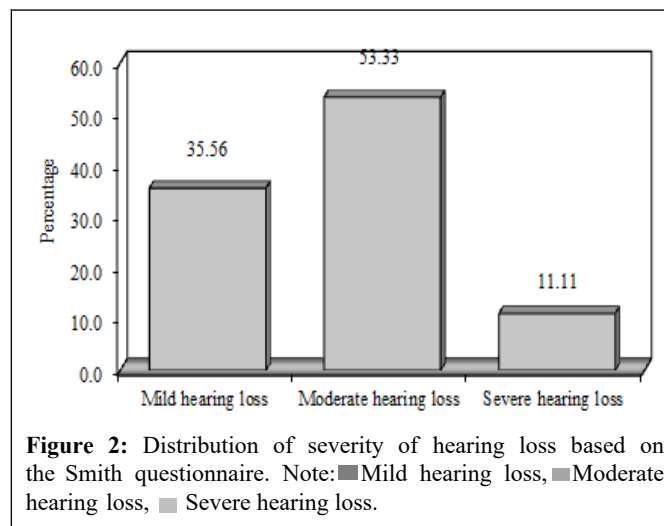


Figure 2: Distribution of severity of hearing loss based on the Smith questionnaire. Note: ■ Mild hearing loss, ■ Moderate hearing loss, ■ Severe hearing loss.

Associated factors	With NIHL	%	Without NIHL	%	Total	%	Chi-square	p-value
Do you perceive hearing loss?								
No	37	51.39	35	48.61	72	90	6.914	0.0090*
Yes	8	100	0	0	8	10		
Do voices sound blurry, like people mumbling?								
No	17	32.69	35	67.31	52	65	33.504	0.0001*
Yes	28	100	0	0	28	35		
Can u understand men's voice better than women?								

No	26	42.62	35	57.38	61	76.25	19.381	0.0001*
Yes	19	100	0	0	19	23.75		
Do you hear ringing in the ear?								
No	29	45.31	35	54.69	64	80	15.556	0.0001*
Yes	16	100	0	0	16	20		
Do you have Hypersensitivity to loud sounds?								
No	38	52.05	35	47.95	73	91.25	5.967	0.0150*
Yes	7	100	0	0	7	8.75		
Do you have Non-auditory symptoms?								
No	34	49.28	35	50.72	69	86.25	9.919	0.0020*
Yes	11	100	0	0	11	13.75		
Do you use hearing protection aids like ear-plugs or ear-muffs?								
No	45	63.38	26	36.62	71	88.75	13.038	0.0001*
Yes	0	0	9	100	9	11.25		
Do you have knowledge about the auditory and non-auditory effects of NIHL?								
No	38	55.07	31	44.93	69	86.25	0.283	0.595
Yes	7	63.64	4	36.36	11	13.75		
Total	45	56.25	35	43.75	80	100		
*p<0.05								

Table 2: Questions on self-assessment and association between presence of hearing loss.

In occupation safety and health act established occupational noise exposure standards limiting the noise exposure an employee may receive in a working day [6]. Sound beyond the permissible limit is harmful to the auditory system. For every 5-dB increase in intensity, time is halved (i.e., 4-hour limit at 95 dBA, 2-hour at 100 dBA, etc.) [7].

Discussion

The present study revealed high NIHL and is particularly important as the subjects were in the economically productive age groups. If they suffer from hearing disability at this age, they would have to live with that disability throughout their life. Exact figures can be calculated by doing audiometry of these subjects. Only 11.25% of traffic police-personnel used personnel protection equipment. This could be due to ignorance about the hazards caused by continuous exposure to noise.

The baseline noise level was as high as 110 dB due to high traffic density and light traffic areas had noise of 70 dB to 92 dB and majority of the road traffic police-personnel worked for 8 h to 12 h per day. NIHL is the second most common cause of hearing loss. It is irreversible but preventable pathology. Better education may help in better understanding and motivation of the subjects.

Protection is the important first line management and effective early screening tools should be established. Thus on the basis of the findings of this study, it is recommended that the periodic medical examination should be done for the traffic policemen and it should include audiometry to assess the health effects of exposure to noise along with the investigations to measure the health effects of air pollution.

Conclusion

The study also revealed that the traffic police personnel, did not use any personal protective equipment's and the non-availability of these

is the common reason for it. Thus it is suggested that not only should these be made available, but also periodic workshops should be carried out to motivate the subjects for their correct and regular usage. The effectiveness of the PPEs over other methods to reduce noise exposure should also be demonstrated.

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