

Original Article

Hearing Status of the Traffic Police with or without Use of Sound Protector in Dhaka Metropolitan City

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Abstract

Background: Sound protector is an essential tool to protect hearing. **Objective:** The purpose of the present study was to see the hearing status of traffic police with or without sound protector. **Methodology:** The cross-sectional study was conducted in the Department of Otolaryngology and Head Neck Surgery at Bangabandhu Sheikh Mujib Medical University, Dhaka from January 2003 to June 2004 for a period of one and half year. Traffic police who were working in the Dhaka metropolitan city at any age were included as study population. Hearing status was measured to all subjects. The traffic police at any age working in the Dhaka metropolitan city with the duration of service more than 5 years were included as study population. Otoscopy examination, tuning fork test and pure tone audiometry were performed by clinical audiometer (AC 33) with two channels, with TDH39 earphones among the entire study subject. **Result:** A total number of 100 traffic polices working in Dhaka metropolitan city were examined. Highest (56%) number of the respondents was in between 30 to 40 years of age group. The mean age with SD was 36.15 ±5.5. In this study 53.0% respondents found to have exposure of 6 to 10 years and 16.0% found to have exposure between 16 to 20 years. It was found that 26 traffic police used ear protector occasionally. Among them 7(26.9%) subjects had different degree of hearing loss. Nonusers had higher rate (23%) of hearing loss (p=0.685). **Conclusion:** In conclusion use of sound protector by traffic police is not significantly related with the hearing loss though this is clinically significant. [*Journal of Current and Advance Medical Research 2017;4(1):13-16*]

Keywords: Hearing status; traffic police; sound protector

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Introduction

Excessive noise exposure is the major avoidable cause of permanent hearing impairment worldwide¹. In a developed country, it is at least partially the cause in more than one third of those with hearing impairment² and, in many countries, is biggest compensatable occupational hazard³. Urban traffic noise pollution is increasing risk factor for hearing impairment⁴. As populations live longer and industrialization and urbanization spreads, noise induced hearing loss (NIHL) will add substantially to the global burden of disability, and hence has a high public health priority⁵.

In the elderly, NIHL may add to the hearing loss of presbycusis to produce a hearing handicap sooner and worse than would occur from age alone. In Thailand a recent study for the National committee on Noise Pollution control of Thailand measured noise exposure and hearing impairment in various occupational groups and found 21.1 to 37.7% with noise induced hearing loss⁶. In Europe, the population exposed to levels above 65 dB increased from 15% in 1980s to 26% in the early 1990s⁷. For comparison, speech can be understood fairly well with the background noise level upto 55 dB. Environmental noise affect health and well being physically, mentally and socially⁸.

In developing country like Bangladesh, occupational noise and urban environmental noise especially traffic noise are the increasing risk factors for hearing impairment. The traffic police who are regularly exposed to this traffic noise in Dhaka Metropolitan city are very much susceptible to noise induced hearing loss.

Traffic noise is probably an alarming hazard, but the scale of problem and its effects needs further systemic high quality research on long term damage. Therefore this present study was undertaken to see the hearing status of traffic police with or without sound protector in Dhaka metropolitan city.

Methodology

This study was designed as cross-sectional study. This present study was conducted in the Department of Otolaryngology and Head Neck Surgery at Bangabandhu Sheikh Mujib Medical University from the duration of January 2003 to June 2004 for a period of one and half year. The traffic police at any age working in the Dhaka metropolitan city with the duration of service more than 5 years were included as study population. Traffic police presented with systemic disease like

hypertension, diabetes mellitus, collagen disease, past history of viral disease, drug therapy which may cause SNHL, duration of service less than 5 years and previous history of otitis media and Known causes of conductive or sensorineural hearing loss were excluded from this study.

Data was collected by face to face in pretested structured questionnaire. Informed verbal consent taken from all study person. Otoscopic examination, tuning fork test and pure tone audiometry were performed by clinical audiometer (AC 33) with two channels, with TDH39 earphones among the entire study subject. Calibration was air conduction ISO 389-1992. Bone conduction was ISO 7566 or ANSI S3.43-1992. Pure tone Audiometry was performed in the early morning by an experienced audiologist. Tympanometry was done by automatic impedance audiometer AT 22. Noise level was measured at 18 different places of Dhaka city. Noise level measured for consecutive 6 days (Saturday-Thursday) in different hours and levels were observed where then averaged noise level was taken. Type-2 noise level meter [Type-2 noise level meter: Standard conformance to IEC (International Electrotechnical commission) publication 123 for sound level meters, JIS (Japanese Industrial Standards) C1502 for sound level meters] was used. Statistical analysis was performed by SPSS. All collected data were checked and verified thoroughly to reduce the inconsistency. The numerical data obtained from this study were complied and analyzed using standard statistical method. P value of <0.05 was considered to be statistically significant.

Results

A total number of 100 traffic polices working in Dhaka metropolitan city were examined. Highest (56%) number of the respondents was in between 30 to 40 years of age group and 23.0% belonged to age group 41 to 45 years and 21% were in 20 to 30 years age group. The mean age with standard deviation (SD) was 36.15 ±5.5 (Table 1).

Table 1: Age Distribution of the Study Subjects (n=100)

Age Group	Frequency	Percentage
21 to 30 Years	21	21.0
31 to 40 Years	56	56.0
41 to 45 Years	23	23.0
Total	100	100.0

*Mean±SD=36.15(±5.5) years

In this study 53.0% respondents found to have exposure of 6 to 10 years and 16.0% found to have exposure between 16 to 20 years (Table 2).

Table 2: Duration of Noise Exposure of the Respondents (n=100)

Duration of exposure	Frequency	Percentage
6 to 10 Years	53	53.0
11 to 15 Years	31	31.0
16 to 20 Years	16	16.0
Total	100	100.0

*Mean±SD=11.2±3.6 years

It was found that 26 traffic police used ear protector occasionally. Among them 7(26.9%) subjects had different degree of hearing loss. Nonusers had higher rate (23%) of hearing loss (p=0.685) (Table 3).

Table 3: Hearing Status of the Users of Sound Protector (n=100)

Ear Protector	Hearing status		Total
	Normal	Impaired	
Yes	19(73.1%)	7(26.9%)	26(100.0%)
No	57(77.0%)	17(23.0%)	74(100.0%)
Total	76(76.0%)	24(24.0%)	100(100.0%)

* Chi-square test was done to see the level of significance; P value=0.685

Discussion

In Bangladesh noise pollution is a health hazard. Increasing ambient noise level in public places from various sources like industrial activity, construction activity, vehicular horn, generator set, loudspeaker, music system, other mechanical device. All the city dwellers are exposed to these noise pollution, but the traffic police of Dhaka metropolitan city are continuously exposed to traffic noise arising from diesel engine vehicle and their hydraulic horn and also from other sources. In Bangladesh there was no study of noise induced hearing loss among the traffic police who are exposed to noise exposure during their 8 hour duty in different places of Dhaka metropolitan city.

In this cross sectional study, 100 traffic police were included for otological and audiological evaluation. Age and duration of exposure was considered. Age of the respondent traffic police was divided into three groups. 56% were in the group between 31-40 years, 23% were in 41-45 years and rest belongs to 20-30 years group. Mean age was 36.15 year with SD (±5.5). Only 16% had duration of exposure between 16-20 years and 31% had duration of exposure between 11-15 years and rest had duration of exposure between 6-10 years. Mean exposure duration were 11.2 year with SD (±3.6). This study showed, however, that majority of noise exposed traffic police did not complain of any hearing

difficulty despite of the presence of hearing impairment as shown by their audiogram. Only 5/24 (20.8%) of the traffic police with hearing impairment complained of having difficulty in hearing, while 79.2% alleged to have normal hearing. Good hearing threshold at essential speech frequencies (500 to 2000 Hz) is important for speech discrimination⁹.

A similar study¹⁰ reported that 16.9% of the workers with hearing impairment complained of having difficulty in hearing in a factory, while, 83.1% alleged to have normal hearing which is consistent with the present study result. Noise induced hearing loss report in Taiwan was found that 19.9% had mild NIHL and 14.1% had sever NIHL¹¹. Among different frequencies, participants hearing threshold at 4 and 6 KHz were all higher in both ears, which is compatible those found in typical cases of noise induced hearing loss. It has been estimated that about 17% of production worker have at least mild hearing loss resulting from occupational noise exposure; 11% have moderate and 5% have moderate to severe hearing loss. No significant difference was found between right and left ear of the respondent traffic police. This finding indicates that adverse noise effect is generally bilateral and symmetrical which is consistent with other study¹².

In this study the magnitude of higher hearing threshold change was found in frequencies at 4 and 6 KHz. In this study only 26.0% told that they sometime used cotton plug as hearing protector device. Among the ear protector users 7/24 (29.5%) of them found to have hearing loss. 17/24 (70.8%) of hearing impaired did not use any hearing protector. The common reason of not using hearing protector was lack of knowledge about noise induced hearing loss. Only few told that this device is not comfortable and causes difficulty in understanding conversation; furthermore it is used for working in noisy environment. The correlation between awareness of hazards of noise to hearing and attitude towards hearing protection device shown in this study is worth nothing. This is well supported by the findings of another study¹³.

In another study Ahmed¹⁴ has showed that the rate of full use hearing protection user, when the noise level was more the 85 dBA, were only 9.0% and sometime use was only slightly higher at 30.0%. This study further confirms the well-documented conclusion that all time use of hearing protection devices protect the hearing, and that wearing hearing protection devices only sometime is in practice, similar to non-use¹⁴. An epidemiological study was carried out in Polland¹⁵. It was found that

occupational noise induced hearing loss was most frequent among all occupational diseases, and its incidence rate exceeds 16 new cases annually per 100000 employees. In another study the authors were concluded that exposed to 98dBA accelerates the evaluation of hearing loss, this trend being more pronounced in male¹⁶.

Limitations are quite common in any study short or long, retrospective or prospective and fewer or larger sample. Still then overcoming limitations is really essential to conduct any study. Considering significant outcome of the study, this study has tried to overcome the limitations as far as possible. Beyond the scope few limitations were faced during doing the study. The exact intensity of the noise of the affected traffic police cannot found because they work in different places of Dhaka metropolitan city in different time of their duty. The magnitude of sound level is different in different places of Dhaka city.

Conclusion

In conclusion use of sound protector by traffic police is not significantly related with the hearing loss; however, the relationship is clinically significant. The duration of noise exposure is more than 10 years in majority of the study population. The measurement of the status of hearing should be carried as a routine procedure or as a emergency basis when the traffic police complains of either deafness or ringing in the ears.

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