

HEARING STATUS AMONG THE TRAFFIC POLICES OF DHAKA METROPOLITAN CITY

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Abstract

Background: Noise induced hearing loss is a common and avoidable occupational hazards in urban environments. People in high noise area suffer from hearing impairment. They are considered as social burden in their late life. Identifying risk groups and providing them a safe occupational environment is the responsibility of welfare state.

Aims and Objectives: To compare hearing between noise exposed traffic police with polices not exposed to high noise.

Methods: A cross sectional study was conducted in Rajarbagh police line hospital from July 2015 to November 2016 where 180 police personnel were enrolled and divided into two groups for comparison with mean duration of work in police force 11.06 years in group-I and 10.48 years in group-II. Work hours of traffic police was 8 hours per day.

Result: 37.7% of traffic police found to suffer from mild and 41.75% suffer from moderate degree of hearing loss that need attention of appropriate authority.

Conclusion: Environmental pollution in Dhaka city is very high. High noise is a risk factors for occupational hazards that must be looked after by civil society and law enforcing agency to implement sound pollution act.

Keywords: Noise induced Hearing loss (NIHL), Occupational Hazards, Traffic police, Dhaka Metropolitan city.

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Introduction

Sound is essential but noise is pollution. Noise is not a new hazard. It has been a constant threat since the industrial revolution. High noise has not only been proven to affect hearing but also causes hypertension, headache, insomnia and others.⁶ Aside from the normal effects of aging (Presbycusis), excessive noise exposure is a most prevailing cause of hearing loss.^{2,3} Occupational noise exposure is the most common cause of NIHL. Firefighters, traffic police, military personnel, construction factory workers, musicians and truck drivers are to name of a few affected by noise. NIHL is preventable except accidental exposure.

Generally sound levels below 75dBA does not endanger permanent hearing loss, even at 4000Hz.⁴ A noise level of 85 dB for an 8-hour daily exposure is potentially dangerous to hearing ability.⁴

According to Association of Noise Consultants (ANC) relationship of noise level and exposure level with time was 3dBA per doubling/halving of time with an 8-hour exposure limit set at 85dBA is used which is recommended by the American Conference of Governmental industrial Hygienists (ACGIH) in 1941.⁷

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In Bangladesh especially Dhaka city traffic noise is very high and traffic police of our country are constantly exposed to this high level of noise due to their occupation. The noise at the different traffic points of Dhaka is very high and in one study it has been found that the average sound levels at 18 different commercial & mixed zone of Dhaka city were 90.6dBA and 93.0dBA respectively. It was much higher than the acceptable level i.e. 60 dBA and 70dBA, as setup by the government of Bangladesh¹⁵. There is no arrangement of periodic screening of these professionals during their service and they are also not tested for their hearing conditions during their intake.

‘An audiometric screening study on traffic police of Metropolitan Dhaka City’ was undertaken to see the impact of noise exposure to them.

Materials and Methods: Cross-sectional study to assess the effect of high noise on the hearing of traffic police and to compare hearing between noise exposed personnel with non exposed.

Sample: Total 180 Police personnel were divided into following two groups for comparison.

Group-I: Ninety Traffic police of Dhaka Metropolitan police (DMP) exposed to high noise.

Group-II: Ninety Police personnel other than traffic police of DMP e.g. reserve police, armed police etc.- was not exposed to high noise.

Exclusion criteria (Group-I):

- Any degree of previously diagnosed hearing impairment.
- Use of hearing aid
- TM perforation
- Previous surgery in ear.
- History of familial hearing loss.
- Recent exposure to ototoxic drugs
- Age more than 55 years.
- Recent exposure to any shooting event/ explosion.

Exclusion criteria (Group-II):

- All the above for the group-I

- Traffic police of DMP (present or past).

Sample size:

Group-I - 90

Group-II - 90

Place of the study: Rajarbagh Police line Hospital, Dhaka.

Duration of the study: July 2015 to November 2016

Data collection:

After taking informed written consent from each case of group-I and group-II, case history was taken in a pre-tested questionnaire and were examined to exclude any previous pathology. Then an expert from Hi-Care Hearing Center performed audiometric evaluation of all the cases of group-I and group-II after explaining the procedure to the individual. The environmental sound intensity level of Rajarbagh Police Hospital was measured by using a sound level meter (Quest sound level meter, Oconomowoc W, WISCONSIN. Model no: 2400). Pure Tone Audiometry (PTA) was done in the lowest noise expose room (43 dBA measured by sound level meter) of the Hospital. A pure tone clinical audiometer (KAMPLEX Audiometer, Model no; A c 30; calibrated by p. c. werth Limited on October 2004) with a frequency range of 125 Hz to 8000 Hz and sound intensity levels of between -10dB to 120dB was used to test each ear of the subject separately.

Data Analysis:

Data analysis was done by computer generated program SPSS version 12; chi-square and students t-test were done wherever and whenever necessary. p value <0.05 was taken as significant.

Results:

A Total of 180 (90 in group-I and 90 in group-II) police personnel were enrolled in this study. All of them were male. Mean age of the group-I was 36.4±6.35 years (range 21-49 years.) and that of group-II was 37.55±4.84 years (range 22-48 years.) Mean duration of work in police force 11.06 years in group-I and 10.48 years in group-II. Work hours of traffic police was 8 hours per day.

Table I
Age distribution

Age in years	Group-I	Group-II	Total
21-30	10(11.11%)	18(20.00%)	28(15.55%)
31-40	20(22.22%)	16(17.77%)	36(20.00%)
41-50	60(66.66%)	56(62.22%)	116(64.44%)
Total	90(100%)	90(100%)	180(100%)

Table II
Average hearing threshold at different frequencies.

		Group-I	Group-II	P
Hearing Thresholds Frequencies in Hz				
250	right ear	23.83±5.52	25.73±4.92	>0.05
	left	25.93±6.12	24.83±5.72	>0.05
500	right	24.83±5.50	23.13±4.52	>0.05
	left	23.83±4.52	24.83±5.52	>0.05
1000	right	23.83±5.53	23.83±5.52	>0.05
	left	23.83±4.51	23.83±5.52	>0.05
2000	right	17.43±5.54	24.83±5.52	<0.05*
	left	17.95±6.58	25.83±5.52	<0.05*
4000	right	16.83±5.55	26.83±5.52	<0.05*
	left	17.83±4.32	28.83±5.52	<0.05*
8000	right	14.73±5.22	33.83±5.52	<0.05*
	left	13.83±5.52	32.83±5.52	<0.05*

Significant hearing loss was seen from 2000 to 8000 Hz in group-I.

Table III
Severity of hearing impairment (Right ear) among the study Group

Hearing impairment (Rt)	Group-I		Group-II		Total		P value
	n	%	n	%	n	%	
No impairment	22	24.44	64	71.11	86	47.78	0.225
mild impairment	50	55.55	18	20.0	68	37.78	0.003
Moderate impairment	18	20.00	08	08.8	26	14.44	0.109
Total	90	100	90	100	180	100	

Significant moderate hearing loss was seen in right ear of group-I.

Table IV
Severity of hearing impairment (Lt Ear) among the study Group

Hearing impairment (Lt)	Group-I		Group-II		Total		P value
	n	%	n	%	n	%	
No impairment	24	26.66	70	77.77	94	52.22	0.255
mild impairment	48	53.33	18	20.00	66	36.66	0.003
Moderate impairment	18	20.00	02	02.00	20	11.11	0.109
Total	90	100	90	100	180	100	

Significant moderate hearing loss was seen in left ear of group-I.

Table IV
Pattern of hearing impairment among the study Group

Impairment	Group-I		Group-II		Total	
	n	%	n	%	n	%
No Impairment	24	26.66	70	77.77	94	52.22
Mild(Bilateral) Impair	42	46.67	04	4.44	46	25.55
Moderate(Bilat) Impair	16	17.77	06	6.66	22	12.22
Mild(Unilateral) Impair	06	6.66	04	4.44	10	5.55
Moderate(Unilat)Impair	02	2.22	06	6.66	08	4.44
Total	90	100	90	100	180	100

Significant moderate hearing loss was seen in group-I working for more than 20years.

Table V
Duration of service in DMP traffic department among the mild and moderate hearing impaired study Group

Duration (years)	Mild hearing impaired		Moderate hearing impaired	
	n	%	n	%
<5	07	10.60	00	00
5-10	13	19.70	02	10.00
6-15	11	16.67	04	20.00
16-20	16	24.24	08	20.00
>20	19	28.79	10	50.00
Total	66	100	24	100

Discussion:

All the city dwellers are exposed to this pollution, but the people having occupation on the road e.g. traffic police, road side vendors, drivers of public transport system, conductors of bus etc are the most vulnerable group. Important roads of Dhaka city have been documented by different researchers for having very high noise level (Bangla Motor 103dB, Sayedabad 84dB Dhanmondi 74dB), beyond the permissive level. Traffic police are continuously being exposed to this high noise during their duty hours (8 hours/day × six days a week). Their long and sustained exposure is making them vulnerable to ONIHL (Occupational Noise induced Hearing Loss).

Mean age of the group-I was 36.4±6.35 years (range 21-58years.) and that of group-II was 37.55±6.30 years (range 22-52 years.). Study subjects over 50 years were excluded from the

study, because of the association of presbyacuatc change in this age group.

Among the study, in group-I 85% and in group-II 77.5% had different grades of hearing impairment. It was graded according to the WHO criteria (1997): mild impairment- 26-40 dB, Moderate impairment - 41-60dB, severe impairment- 61-80dB and profound impairment >81 dB. Only mild and moderate hearing impairment were found, no cases with severe and profound hearing impairment was detected in both the group-I and group-II. When analyzed with the individual ears (Table-III, IV, V) the finding was also not significant. This result reflects higher number of police personnel in Dhaka are suffering from different grades of hearing impairment. This also probably reflects the effect of noise pollution in Dhaka city at large extent which is alarming.

In group-I the number of mild hearing impairment in the right ear was 30 (57.9%) and in the left ear was 47 (71.60%), whereas moderate impairment was more in right ear 10 (10.2%) but 3 (3.2%) in left ear. The difference with group-II in right and left ear was not found to be statistically significant. Again when analyzed between moderate hearing impairment in unilateral ear among the group-I and group-II the result was found to be statistically significant ($p=0.023$). The reason why right ear was more affected than the left, is not exactly known.

Both mild and moderate hearing impairment were more common (39.2%) among the 31-35 years age group in the group-I. In the group-II the mild and moderate hearing impairment is more prevalent among the 21-25 years age group. The duration of police service had an impact on both the mild and moderate hearing impaired (Table-V). Those who were serving for 11-15 years and >22 years were the predominant groups of mild hearing impairment 37.7% and 29.95% respectively. Moderate hearing impairment was found to be more common 51(41.7%) among the 16-21 years younger group. This indicates the longer duration serving group was more vulnerable to moderate hearing impairment. But the relationship to service period in the DMP traffic department seems to have no impact on hearing impairment. Mild hearing impairment was more common (62.8%) among those who are serving between 1-5 years and the rest 41.7% had moderate hearing impairment for the same duration of service.

Conclusion

Statistically significant number of police working in the noisy place developed NIHL of moderate degree. Their rehabilitation is necessary. The DMP traffic personnel should have a regular audiometric evaluation, at least once a year as a part of their annual health check-up. Sound pollution act must be implemented throughout the country to prevent development of such health hazards.

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