



A Comparative Study of Morbidity Profile of Traffic Policemen and Non Traffic Policemen in Solapur City of Western Maharashtra

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ABSTRACT

Introduction: The traffic policemen are engaged in controlling vehicular traffic and are typically exposed to higher concentrations of transport related air pollution as well as noise pollution daily. Hence they are at a risk of developing various health problems due to their occupation. The study was conducted to compare morbidity profile of traffic policemen with non traffic policemen

Methods: A cross sectional study was carried out on 114 traffic policemen and 114 non-traffic policemen. History regarding symptoms, history of present illness, past history, personal and family history was obtained. Statistical analysis was done with the help of percentages, chi-square test and 't' test.

Results: Annoyance to noise (51.75%) was the most common symptoms experienced at work place by the traffic policemen as compared to the non-traffic policemen. Respiratory morbidities were found significantly more in the traffic policemen. The traffic policemen (92.30%) had more cardiovascular disease risk than the non-traffic policemen (75%).

Conclusions: Respiratory morbidity like URTI and chronic rhinitis were found significantly more in the traffic policemen than non-traffic policemen.

Key-words: Morbidity, auditory, respiratory symptoms, traffic policemen

INTRODUCTION:

Every year 800,000 people die prematurely from lung cancer, cardiovascular and respiratory diseases caused by outdoor air pollution and 4.6 million lost life-years each year around the globe.¹ Other adverse health effects include increased incidence of chronic bronchitis and acute respiratory illness, exacerbation of asthma and coronary disease, and impairment of lung function. The burden of ill-health is not equally distributed as approximately two-thirds of the deaths and lost life-years occur in developing countries of Asia.¹ A review of several studies indicates that a long-term, repeated exposure to air pollution increases the cumulative risk of chronic pulmonary and cardiovascular disease and even death.¹

Environmental noise (defined as noise emitted from all sources except industrial workplaces) is an

important public health problem in Europe in densely populated urban areas.² The main exposure is road traffic noise. The environmental burden of disease due to environmental noise has been recently estimated for western European countries with a range of 1.0–1.6 million DALYs lost across all health outcomes. The estimates are 61,000 DALYs for ischaemic heart disease, 45,000 for cognitive impairment of children, 9,03,000 for sleep disturbance, 22,000 for tinnitus and 5,87,000 for annoyance.²

The traffic policemen are engaged in controlling vehicular traffic at various squares and busy roads of the city and are typically exposed to higher concentrations of transport related air pollution as well as noise pollution daily. Hence they are at a risk of developing various health problems due to their occupation.

The traffic policemen are having outdoor occupations in urban areas. They are engaged in controlling vehicular traffic at various squares and busy roads of the city and are typically exposed to higher concentrations of transport related air pollution and noise pollution daily for about 8 hours.

When compared with the general population, people with outdoor occupations in urban areas are typically exposed to higher concentrations of transport-related air pollution or are in contact with it for longer periods, or both. The extent of exposure and health problems to transport-related air pollution and noise pollution for many occupations is poorly understood or unknown.

Hence the study is carried out with objective to compare the morbidity profile of traffic policemen with non-traffic policemen to know any associated occupational factors and to suggest the measures for control and prevent the morbidity due to their work related exposures.

SUBJECTS AND METHODS

A cross sectional study was carried out on 114 traffic policemen from the traffic control branch of the city from 1st Jan. to 30th Sept. 2011 and the morbidity profile of the traffic policemen was compared with 114 non-traffic policemen from the police headquarter of the city. Written permission was obtained from Commissioner of Police of the city.

All traffic policemen who are actually engaged in controlling vehicular traffic at 40 different places like squares and roads of the city were included in the study and traffic Policemen who were not engaged in actual controlling of vehicular traffic and women Traffic police as they were in very small number (n = 2) were excluded from the study. Total 114 traffic policemen were eligible out of 126 traffic policemen staff of traffic control branch of the city. Remaining 12 traffic policemen were engaged only in office work. A list of all eligible traffic policemen was prepared and stratified into four age groups i.e. 20 to 30 years, 30 to 40 years, 40 to 50 years and ≥ 50 years. Separate list of eligible study subjects was prepared based on this.

In non-traffic policemen, the policemen who had never worked as traffic policemen and never performed the duties of controlling vehicular traffic were included in the study and the policemen who had performed the duties as traffic policemen in the past and women police were excluded from the study. The non-traffic policemen were selected from the Police Headquarter of the city. Total 468 policemen were eligible who fulfilled the criteria. Age group wise list of these subjects was prepared. The approval of Institutional Ethical Committee was taken before the start of the study.

Age group matching was done by selection of required number of age matched subjects from non-traffic policemen list by lottery method. Total 114 non-traffic policemen were selected. Pre-designed proforma for examination of the study subjects was developed and tested by conducting pilot study on 15 traffic policemen and 15 non-traffic policemen. Necessary changes were made in the proforma. Time schedule of examination of study subjects was done according to their duty hours and with permission of the police authorities.

The examination of the study subjects was done at Urban Health Center of the Medical College which is nearby the Police Commissioner Office. Written consent was taken and the purpose of the study was explained before examination.

Total 114 traffic policemen and 114 non-traffic policemen were examined within the study period. Same proforma was used for examination of traffic policemen and non-traffic policemen. History regarding symptoms experienced at the workplace, history of present illness, past history, personal history and family history was obtained. Blood pressure was also measured by standard method.³ Pulmonary function was measured by peak expiratory flow rate. Cardiovascular risk assessment was done according to guidelines by World Health Organization (WHO) 2007.⁴ The subjects were referred for other investigations and treatment at the Medical college hospital as and when required.

RESULTS

The present study was carried out on 114 traffic policemen and their morbidity profile was compared with 114 non-traffic policemen.

Table 1: Distribution of study subjects according to symptoms experienced at the workplace

Symptoms	Traffic Policemen (N=114) (%)	Non-traffic Policemen (N=114) (%)	P value
Annoyance to noise	59 (51.8)	32 (28.1)	<0.001
Eye Irritation	37 (32.5)	10 (8.8)	<0.001
Sneezing	31 (27.2)	7 (6.1)	<0.001
Cough	29 (25.4)	6 (5.3)	<0.001
Throat Irritation	28 (24.6)	11 (9.7)	0.001
Joint pain	26 (22.8)	30 (26.3)	0.28
Nasal Irritation	24 (21.1)	5 (4.4)	<0.001
Backache	23 (20.2)	27 (23.7)	0.261
Itching in the groin	22 (19.3)	28 (24.6)	0.17
Tinnitus	19 (16.7)	7 (6.1)	0.006
Difficulty in Breathing	17 (14.9)	2 (1.8)	<0.001
Tiredness	17 (14.9)	22 (19.3)	0.193
Headache	16 (14)	11 (9.7)	0.16
Itching all over body	15 (13.2)	6 (5.3)	0.02

P value <0.01 indicates Highly Significant, <0.05 indicates Significant and >0.05 indicates Not Significant.

Table 2: Morbidity pattern among study subjects

Diagnosis	Traffic Policemen (N=114) (%)	Non-traffic Policemen (N=114) (%)	RR (95% CI)	X ² Value (df=1)	P value
Obesity	72 (63.2)	77 (67.5)	0.93 (0.77-1.13)	0.48	0.5
Hypertension	34 (29.8)	21 (18.4)	1.61 (1.0-2.61)	4.05	0.046
URTI	17 (14.9)	7 (6.1)	2.42 (1.04-5.63)	4.66	0.031
Chronic Rhinitis	16 (14)	5 (4.4)	3.2 (1.21-8.44)	6.35	0.012
Chronic Bronchitis	15 (13.2)	4 (3.5)	3.75 (1.28-10.95)	6.95	0.001
Urticaria	15 (13.2)	6 (5.3)	2.5 (1.0-6.10)	4.25	0.04
Acute Peptic Disease	13 (11.4)	11 (9.7)	1.18 (0.55-2.52)	0.19	0.67
Fungal Infection	12 (10.5)	14 (12.3)	0.85 (0.41-1.77)	0.17	0.69
Diabetes Mellitus	10 (8.8)	8 (7)	1.25 (0.51-3.05)	0.24	0.63
Sub mucous Fibrosis	9 (7.9)	11 (9.7)	0.81 (0.35-1.89)	0.22	0.64
Hemorrhoids	8 (7)	6 (5.3)	1.33 (0.47-3.72)	0.3	0.59
Hydrocele	3 (2.6)	2 (1.8)	1.5 (0.25-8.80)	-	
Hernia	2 (1.8)	3 (2.6)	1.5 (0.25-8.80)	-	
IHD	2 (1.8)	2 (1.8)	-	-	

N = Total number of study subjects, RR= Relative Risk, X²= Chi-square test. n = Number of study subjects who had the morbidity, df =Degrees of freedom.

In the table no. 1 it was observed that, while on the duty, near about half of the traffic policemen (51.75%) had annoyance to noise particularly due to horns and vehicular noise while 28.07% non-traffic policemen had annoyance to noise. Nearly half of the traffic policemen experienced respiratory symptoms at the work place. The occurrence of respiratory symptoms such as sneezing, cough, throat irritation, nasal irritation and difficulty in breathing was observed more in the traffic policemen as compared to the non-traffic policemen which was statistically significant.

Table 3: Observed Peak Expiratory Flow Rate in Traffic and Non-traffic Policemen according to age in years

Age Group in Years	N	Traffic Policemen Observed PEFR LPM (M±SD)	Non-traffic Policemen Observed PEFR LPM (M±SD)	P value
20 to 30	37	502.16 ± 61.30	520.81 ± 57.86	0.192
30 to 40	23	460.43 ± 59.86	497.82 ± 54.35	0.036
40 to 50	33	421.82 ± 59.80	453.33 ± 54.17	0.032
≥ 50	21	380.47 ± 62.41	417.62 ± 53.39	0.051
Total	114	448.07 ± 62.72	477.63 ± 51.85	0.0001

LPM = Litres Per Minute; M=Mean; SD= Standard Deviation; t test applied for calculation of p value.

In the table no.2, Obesity was found the major health problem in both the traffic policemen and non-traffic policemen. Hypertension was found in 29.82% traffic policemen, which was more than in the non-traffic policemen (18.42%) which was statistically significant (P < 0.05).

In the table no.3, it was observed that, the traffic policemen had mean observed PEFR 448.07 (± 62.72) LPM which was significantly reduced than mean observed PEFR 477.63 (± 51.85) LPM in non-traffic policemen (P < 0.05). When compared age group wise it was observed that the traffic policemen had reduced PEFR in each age group than the non-traffic policemen.

In the table no.4, it was observed that 21.05% traffic policemen had abnormal PEFR (i.e. PEFR value less than 80% of the predicted PEFR value) where as 7.02% non-traffic policemen had abnormal PEFR. This occurrence of abnormal PEFR in traffic policemen was statistically significant (P< 0.01).

In the table no.5, after assessment of cardiovascular risk level in the study subjects according to guidelines given by World Health Organization (WHO) 2007⁴, it was observed that in the age group ≥40 years of age 92.30% traffic policemen had cardiovascular risk as compared to 75% non-traffic policemen.

Table 4: Age wise distribution of study subjects according to abnormal PEFR

Age Groups in years	Traffic Policemen		Non-traffic Policemen		P Value (1 tail)	RR(95% CI)
	N	Abnormal PEFR (%)	N	Abnormal PEFR (%)		
20 to 40	60	09 (15)	60	02 (3.33)	0.014	4.5, (1.01-19.96)
≥ 40	54	15 (27.77)	54	06 (11.11)	0.015	2.5, (1.04-5.95)
Total	114	24 (21.05)	114	08 (07.02)	0.0012	3(1.40-6.31)

N=Total number of study subjects in the age group.

Table 5: Distribution of Study Subjects \geq 40 years of age according to cardiovascular risk level

Cardiovascular risk level	Traffic Policemen (N= 52) (%)	Non-traffic Policemen (N= 52) (%)
< 10 %	45 (86.54)	38 (73.08)
10% to 20%	1 (1.92)	1 (1.92)
20% to 30%	1 (1.92)	0 (-)
30% to 40%	1 (1.92)	0 (-)
Total	48 (92.3)	39 (75)

N=Total number of study subjects who were assessed for cardiovascular risk level according to guidelines given by WHO 2007⁴. (For assessment of cardiovascular risk level, the study subjects < 40 years and the subjects who had established ca For total study subjects: χ^2 5.69, df 1, RR 1.23 (1.03-1.46) P 0.018.

DISCUSSION

The present study found that auditory symptoms like annoyance to noise and tinnitus was experienced more by traffic policemen than the non-traffic policemen ($P < 0.01$) and may be due to the exposure of traffic policemen to the vehicular noise while controlling vehicular traffic. In the study carried out by Tripathi SR and Tiwari RR (2006)⁵ in Ahmedabad, it was observed that 11.6% traffic policemen complained of regular tinnitus.

The occurrence of respiratory symptoms such as sneezing, cough, throat irritation, nasal irritation and difficulty in breathing was observed more in traffic policemen as compared to non-traffic policemen which was statistically significant. Nearly half of the traffic policemen (50.88%) experienced respiratory symptoms at the work place which was nearly same as observed in the study carried out in Hyderabad and Secunderabad twin city by Thippanna G and Sudeep Lakhtakia (1999)⁶, in which 54.4% of traffic constables had respiratory symptoms at the work place where as in the study carried out by Khare KC (2000)⁷ found high prevalence of respiratory symptoms (91.3%) among traffic policemen which was more than found in the present study. This may be related with density of vehicles which may varies from city to city.

In the present study symptoms like annoyance to noise, tinnitus and respiratory symptoms like sneezing, cough, throat irritation and difficulty in breathing and symptom like itching all over body were found significantly more in traffic policemen than non-traffic policemen probably due to exposure of traffic policemen to the road traffic noise and traffic related air pollutants during their on busy roads and squares of the city.

Regarding the morbidity pattern among the study subjects in the present study (Table No. 2), obesity was found the major health problem in both the traffic policemen and non-traffic policemen. The non-traffic policemen group had more obese subjects (67.54%) than traffic policemen (63.16%) but

this difference was statistically not significant ($P > 0.05$) which was similar to the finding observed in the study carried out at Pondicherry, India by Pal P. et al (2010)⁸ on traffic policemen and general policemen. While in the cross-sectional study carried out at Buffalo, New York by Leunda E. Charles et al (2007)⁹, it was observed that 41.27% police officers were obese and in the studies carried out by Satapathy DM et al (2009)¹⁰ and Saha A. et al (2010)¹¹, it was observed that 8.5% traffic policemen and 4% general police officers were obese respectively. While in the present study we observed 63.16% traffic policemen and 67.55% non-traffic policemen were obese.

The classification of obesity was done according to Misra A. et al (2009)¹² for Asian Indians, in which the cut-off point for defining obese was taken as BMI equal to or more than 25 kg/m². Hence obesity in both traffic policemen and non-traffic policemen were found more in the present study.

Second major health problem found was hypertension in both the traffic policemen and the non-traffic policemen. The occurrence of hypertension was found significantly more in traffic policemen than in the non-traffic policemen ($P < 0.05$) and the traffic policemen had 1.61 times higher risk of developing hypertension than the non-traffic policemen (RR 1.61, 95% CI 1.0- 2.61). This may be due to stress related to heavy vehicular traffic and standing position for long time while doing job.

Respiratory morbidity like upper respiratory tract infections (URTI), chronic rhinitis, chronic bronchitis were observed significantly more in traffic policemen than in non-traffic policemen. This may be due to exposure to outdoor air pollution.

In the present study, the respiratory disorders were found more in traffic policemen than in the non-traffic policemen which may be because of their exposure to vehicular exhaust and road traffic related air pollution.

Comparison of observed PEFR in traffic policemen and non-traffic policemen according to age in the present study (Table No.3) showed that, the traffic policemen had mean observed PEFR less than the mean observed PEFR in the non-traffic policemen in each age group and in total. Similar finding was observed in the studies carried out on traffic policemen by Pal P. et al (2010)⁸ and Gupta S. et al (2011)¹³ in which they found that the mean observed PEFR in the traffic policemen was significantly reduced than the mean observed PEFR in the general policemen and in the study carried out in traffic policemen of Jalgaon city, India by Ingle ST et al (2005)¹⁴ it was observed that, the traffic policemen had reduced PEFR in comparison to control group ($P < 0.0001$).

In the present study, age wise distribution of study subjects according to abnormal PEFR (Table No. 4) showed that, in the age group < 40 years and also in the age group ≥ 40 years, occurrence of abnormal PEFR was found significantly more in the traffic policemen than that found in the non-traffic policemen and in total. In the study carried out on the traffic policemen in Thonburi district, Thailand by Wongsurakiat P. et al (1999)¹⁵ it was observed that, 21.1% traffic policemen had abnormal pulmonary functions as compared to 12.4% general population ($P < 0.05$) and in the study conducted by Khare KC (2000)⁷ on traffic policemen of Indore, India, found that 39.12% traffic policemen had abnormal PEFR which was more than that observed in the present study (21.05%). The results of the present study indicate that the abnormal peak expiratory flow rate (PEFR) among the traffic policemen may be due to their exposure to vehicular air pollution.

In the present study cardiovascular risk level among the study subjects ≥ 40 years of age (Table No. 5) according to guidelines given by WHO 2007⁴ showed that the percentage of traffic policemen having cardiovascular risk was more than the percentage of non-traffic policemen having cardiovascular risk this may be due to stress and tension related to their job.

CONCLUSIONS

Annoyance to noise and eye irritation were most common symptoms experienced at work place by traffic policemen. Respiratory morbidity like URTI, chronic rhinitis and chronic bronchitis were found significantly more in traffic policemen as compared to non-traffic policemen. In the age group ≥ 40 years of age traffic policemen had more cardiovascular risk as compared to non-traffic policemen.

RECOMMENDATION

As the traffic policemen were more exposed to road traffic related air pollution and noise pollution, personal protective devices like masks, goggles, ear plugs and muffs should be provided for the traffic policemen and encouraged to use the devices at the work place to prevent the possible health hazards. The traffic policemen and the non traffic policemen should be encouraged to adapt stress relaxation techniques such as Yoga, Pranayam, Meditation etc. to prevent hypertension.

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