



## Health Status of Traffic Police Personnel: A Cross-Sectional Study

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### ABSTRACT

**Background:** Traffic policemen are one of the most vulnerable groups to various illnesses as they are exposed to dust, noise, fumes, ultra-violet radiation during their work.

**Methods:** A cross-sectional study was conducted on the 36-Whitefield traffic police personnel. The study group classified into two sub groups 'A' and 'B' depending on the duration of exposure less than or equal to 5-years and more than 5-years respectively.

**Results:** Health ailments detected were Eye irritation (14 persons- 38.9%), Chronic Cough (8 persons- 22.2%), Wheeze (4 persons- 11.1%), Dermatitis (6 persons- 16.7%), Anxiety (4 persons- 11.1%), Varicose veins (4 persons- 11.1%) and Fatigue (4 persons- 11.1%). 8 (22.2%) had chest expansion less than 4cm and 21 persons (58.3%) had reduced PEFr less than 500L/min. 16 (44.4%) personnel belonged to group A (occupational exposure  $\leq$ 5 years) while 20 (55.6%) belonged to group B (occupational exposure  $>$ 5 years). The group B had a higher prevalence of all the health ailments. Only 11 policemen were using any personal protection measures.

**Conclusion:** Traffic police showed a high prevalence of various health ailments due to occupational exposure which increases with the duration of exposure. The study was used to increase group's awareness towards preventive measures.

## INTRODUCTION

The place of work is a significant part of man's environment as he spends at least 8 to 10 hours a day at work. So health is affected by work environment to a large extent. Although there are several types of environments, it's the physical environment which plays a vital bearing on health.<sup>1</sup> Traffic policemen are persistently exposed to dust, vehicular exhaust, noise, fumes, ultra-violet radiation, heat, etc. during their work which makes them vulnerable to physical illnesses. They are also prone to stress disorders due to work related pressures.<sup>2</sup>

Whitefield area, Bengaluru, India is a high traffic zone with air pollution being critical as per Central Pollution Control Board study.<sup>3</sup> Hence a study was conducted to assess the health status of traffic police personnel of Whitefield, Bengaluru and to know their knowledge in preventive measures.

## OBJECTIVES

1. To assess the pulmonary function of traffic police personnel in Whitefield, Bengaluru.
2. To estimate the prevalence of other health ailments in the study population.
3. To recommend preventive measures to improve the health status of traffic policemen.

It was a cross-sectional study conducted in the Department of Community Medicine, Vydehi Institute of Medical Sciences & Research Centre, Bengaluru, India from January to March 2009. Ethical clearance was taken from Institute Ethics Committee. Permission was sought from in charge of Whitefield Police Station, Bengaluru, India.

Sample size (36) was calculated using the formula,

$$n = \frac{Z^2 \times p \times q}{d^2}$$

Z= 1.96 (taking confidence as 95%)

p= prevalence (considered as 40%)

q= p-q

d= error (17%)

So, data was collected from 36 traffic police personnel selected from Whitefield Police Station, Bengaluru city. Informed consent was taken. A predesigned proforma consisting of clinical history, examination and investigations haemoglobin, total leukocyte count, differential count, random blood sugar and pulmonary function test, chest X-ray and ECG. Peak expiratory flow rate (PEFR) was measured using Peak flow meter. An average of 3 readings was considered for final PEFR. Chest expansion less than 4cm and PEFR less than 500L/min were considered significant. The study group was divided into Group A (occupational exposure  $\leq$  5 years) and Group B (occupational exposure  $>$ 5 years).

## Statistical Analysis

Data was analyzed in the same year (2009). Numerical data were expressed in mean  $\pm$  standard deviation. Prevalence of various health ailments were expressed in percentage. Fischer's exact 't' test was used to find the statistical difference between the two groups and 'p' value less than 0.05 with confidence interval (CI) was considered significant.

## RESULTS

A total of 36 traffic policemen were studied. All were males. Mean age was  $41.19 \pm 11.38$  years. Youngest was 24 years while 58 year man was the eldest. 12 (33.33%) patients were found in the age group of 41-50 years. The mean duration of exposure was  $11.55 \pm 9.9$  years with a range varying from one month to 33 years.

Only one person was found to be using a respirator, while 11 of them were using either a surgical mask or cloth that too only during peak traffic hours which lasted one to two hours a day. The reasons for not using respirator as per the personnel were

- Respirator interferes with the usage of whistle
- Feels difficulty in breathing
- Feels uncomfortable
- Feels the heat on face

None of the traffic personnel was using eye protection. Eye irritation was the most common health ailment in the study population, seen in 14 (38.9%) of the study group. Other ailments found were Chronic Cough (8 persons- 22.2%), Wheeze (4 persons- 11.1%), Dermatitis (6 persons- 16.7%), Anxiety (4 persons- 11.1%), Varicose veins (4 persons- 11.1%) and Fatigue (4 persons- 11.1%). Diabetes mellitus was present in 7 persons (19.4%), Hypertension in 6 persons (16.7%) and Chronic bronchitis in 4 persons (11.1%).

Mean Chest expansion of the study groups was  $4.53 \pm 1.5$  cm (range: 1.2 to 8cm) while mean Peak expiratory flow rate was  $458 \pm 97.68$  L/min (range: 234 to 663 L/min). In total, 8 persons (22.2%) had chest expansion less than 4cm and 21 persons (58.3%) had reduced PEFR less than 500L/min. 16 (44.4%) personnel belonged to group A (occupational exposure  $\leq 5$  years) while 20 (55.6%) belonged to group B (occupational exposure  $> 5$  years). The group B was found to have a higher prevalence of all the health ailments compared with group A, but only dermatitis was statistically significant (Table- I). In the study group, 16 (44.4%) were smokers while 15 (41.7%) were alcoholics. The smokers and alcoholics were 6 (37.5%) vs. 10 (20%) and 6 (37.5%) vs. 9 (45%) in group A and B respectively.

**Table-I :** Health ailments compared with duration of exposure

Health ailments	Duration of exposure (n=36)				Fischer's exact test value
	0-5 years (16)		>5 years (20)		
	No.	Percent age	N o.	Percentag e	
Eye irritation	4	25	8	40	0.5
Cough	2	12.5	6	30	0.3
Wheeze	0	0	4	20	0.1
Dermatitis	0	0	6	30	0.02
Fatigue	1	6.3	3	15	1
Anxiety	1	6.3	3	15	1
Varicose veins	1	6.3	3	15	1
Chest expansion <4cm	2	12.5	6	30	0.3
PEFR <500L/min	10	62.5	11	55	0.7
Diabetes mellitus	4	25	3	15	0.7
Hypertension	2	12.5	4	20	0.7
Chronic bronchitis	0	0	4	20	0.1

## DISCUSSION

Health is not a commodity, but it's a way of functioning within one's work, recreation, and living environment. The work environment is the most important part of man's total environment.<sup>2</sup>

Traffic policemen are a group of people who are exposed to a lot of physical and mental stress. Environmental pollution escalates occupational hazards in this group. In urban areas industrial or vehicular pollution is predominant and significantly contributes to air quality problems. Road traffic produces volatile organic compounds, suspended particulate matter (SPM), Oxides of Sulphur (SOx) and carbon monoxide (CO), which play a major role in ill health of the exposed population.<sup>4</sup> The particles emitted from the vehicular exhaust of more than 10-micron size are held in the upper respiratory tract and particles less than 10-micron size accumulate in the lung and produces respiratory abnormalities. In general, diesel vehicles outnumber petrol vehicles and smoke is one of the major products of diesel burning. Almost all diesel smoke particles are fine particles which allow toxic organic compounds to get adsorbed easily. These fine smoke particles can reach deep into the alveoli to enter bloodstream and increase the risk of cardiac and respiratory diseases, malignancy, sudden death, diabetes, premature delivery and low birth weight.<sup>5</sup>

The prevalence of obstructive, restrictive and mixed type of functional impairment of the lung is directly related to the dust concentration and duration of exposure. Prolonged exposure to dust can result in chronic bronchial problems.<sup>5,6</sup> Apart from air pollution, traffic police are exposed to heat, ultra-violet radiation, and noise which lead to ear, nose, throat, eye and skin disorders. Traffic police are also affected by work related pressures. This leads to anxiety, depression, dissatisfaction and fatigue.<sup>5</sup>

We chose Whitefield traffic police personnel as Whitefield is one of the critical air pollution zone as noted by Central Pollution Control Board Study by Madhusudanan.<sup>3</sup> The concentration of Suspended Particulate Matter (PM<sub>10</sub>) was ranging

from 224  $\mu\text{g}/\text{m}^3$  with air pollution level was considered critical in this zone by Madhusudanan in his study.<sup>3</sup>

Our study shows that traffic police are having a high prevalence of eye irritation, dermatitis, chronic cough, wheeze, diabetes, hypertension, varicose veins, anxiety, fatigue, and bronchitis. There are a few studies which support our findings such as DM Satyapathy et al.<sup>2</sup>, Neide Regina Simoes Olmo<sup>5</sup> and Kanchana et al.<sup>6</sup> Our study showed that a major portion of the group were having chest expansion less than 4 cm indicating chronic lung damage which was more in persons exposed for longer duration (30% vs 12.5%). PEFr was affected in more than half the study group (58.3%). These findings are similar to DM Satyapathy et al.<sup>2</sup> The stress levels increase with prolonged exposure as evidenced by a high prevalence of addiction status in study group exposed for more than five years.

Our study also showed that almost all of these health ailments were showing an increasing trend with the duration of exposure. We also found that the study population was hardly using any personal protection measures making them susceptible to ill effects of occupational hazards.

## CONCLUSION

Traffic police personnel show a high prevalence of various health ailments due to occupational exposure which increases with the duration of exposure. Most of the traffic police personnel were hardly using any personal protection.

## RECOMMENDATIONS

We recommend the following to reduce the occupational hazards of traffic police-

1. Use of personal protective measures like:
  - a) Respirator
  - b) Sun glasses with good ultraviolet protection.
  - c) Abstinance from smoking and tobacco use
  - d) Reduce the time spent in traffic congestions by giving proper breaks and interchanging between bench work and field work

2. Modification of respirator so that it is acceptable and easy to use.
3. Periodic health check-ups preferably every 6 months.
4. Provision of shower facility which can be used after duty.
5. Having posters depicting hazards of pollution and measures that can be taken to prevent them.
6. Having schemes to benefit the personnel during periods of illness.
7. Measures to reduce traffic density like:
  - a) Use of public transport as often as possible.
  - b) Car-pooling during peak hours
  - c) Imposition of road tax during peak hours high traffic density areas.

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