www.jmscr.igmpublication.org
Impact Factor (SJIF): 6.379
Index Copernicus Value: 71.58
ISSN (e)-2347-176x ISSN (p) 2455-0450
crossref DOI: https://dx.doi.org/10.18535/jmscr/v6i3.158

IGM Publication
Journal Of Medical Science And Clinical Research
An Official Publication Of IGM Publication

Deteriorating Lung Functions in Traffic Police Working in Amravati Science last three years

Author
Dr Pradeep B Shingore
Associate Professor Dept. of Pulmonary Medicine PDMC Amravati

Introduction

Exposure to environmental pollutants can have effects on lungs. A source of air pollution contains different type of gases (hydrocarbons, Carbon monoxide, Lead, Nitrogen oxides) due to by vehicular exhaust due to increased number of automobiles working on petrol and diesel fuels. Air quality in cities, is mainly due to vehicular emissions. Among the motor vehicle generated air pollutants, diesel exhaust particles account for a highly significant percentage of the particles emitted in many towns and cities. Air pollution in the urban atmosphere has received much attention during last few decades and several researchers have linked it with serious health risks like respiratory diseases[1]. Modern industrial society produces a large number of gases and particles which can pollute outdoor air. Recently, one of the major sources has been the burning of coal in power stations, other industries and homes.

When we breathe in dirty air, we bring air pollutants deep into our lungs, so it's no surprise that air pollution causes serious damage to the respiratory tract. Air pollution exposure can trigger new cases of asthma, exacerbate a previously-existing respiratory illness, and provoke development or progression of chronic illnesses including lung cancer, chronic obstructive pulmonary disease, and emphysema. Air pollutants also negatively and significantly harm lung development, creating an additional risk factor for developing lung diseases later in life[2].

Worldwide According to the WHO in 2008, 1.3 million deaths were estimated due to air pollution. The figure in 2012 became 3.7 million, which was nearly triple. Two million deaths were attributable to the effects of household air pollution in 2008. This number also increased as nearly doubled (4.3 million) according to the 2012 WHO report. More than two million premature deaths each year were related to air pollution. Worldwide, in 2012 seven million deaths were attributable to the joint effects of household and ambient air pollution[3].

Majority of the Amravati Traffic personnel screened for lung capacity function in the city were found to have shortness of breath, abnormal lung function, allergy and high blood pressure. "Many also had symptoms indicative of early signs of asthma like wheezing, shortness of breath, chest tightness or pain, chronic coughing, troubled sleeping due to coughing or wheezing.

Recent evidence from developing countries confirms the direct exposure–response relationship between indoor air pollution by combustion of biomass fuels generating high

levels of particulates and sulphur dioxide with increased acute respiratory infections in adults and children[4]. These observations have renewed interest in how air pollutants may exert their toxic effects through interaction with infection. This brief historical review of air pollution events confirms that air pollution by whatever mechanism can kill and equally importantly, that with sufficient public interest and the political will, effective legislation can reduce the mortality effects of such pollutants.

The effect of smog on the lungs is not so dramatic. Scientists have now conducted a number of laboratory experiments in which volunteers are exposed to ozone inside a steel chamber for a few hours. Even at quite low concentrations there is a reversible fall in lung function, an increase in the irritability of the lungs and evidence of airway inflammation. Although irritable and inflamed lungs are particularly seen in people with asthma and other lung diseases, these effects of ozone also occur in healthy subjects. In other studies we found that people living in high polluted area have more symptoms and worse lung function than those living in rural areas. Children attending school camps show falls in lung function even at quite low concentrations of ozone. There is also a relationship between ozone levels and hospital admissions for asthma.

Traffic Police officers spend much more of their working hours on the roads exposing themselves in polluted air and thus at a higher risk of developing respiratory disorders. Among them, most of the traffic police officers who work in heavy traffic roads in main cities during their duty hours.

There is no single study literature found so far in Amravati district regarding health problem of Traffic police officers. Therefore, the aim of the study was to assess the significance of the lung disease in Traffic police officers who exposed to vehicle exhaust and to necessitate immediate preventive measures have to be taken to control the air pollution in Amravati.

Material and Methods

Randomly 100 Traffic police officers were selected for Lung function from the Amravati traffic police. Self administered questionnaire was used to gather socio-economic data and respiratory symptoms and anthropometric parameters were measured. Respiratory functions were measured using the mini-spirometer. Among them 65 of the study subjects were working in urban areas of Amravati city and rest of the 35 were working in rural areas. The Normal Controls includes 50 males involving all those in non-traffic job from PD Medical College Amravati.

Inclusion Criterion

- Non-smokers
- No previous history of any respiratory illness.

Exclusion Criterion

- Presence of any acute or chronic respiratory disorders, systemic illness indirectly affecting respiratory system

Data was collected from the traffic police officers of the study by interview based on the study questionnaire. The questionnaire survey, an occupational health questionnaire was designed on the basis of American Thoracic Society, Division of Lung Diseases[5]. The traffic police officers and the controls were subjected to pulmonary functions test. Before the test, age, height, and weight of the subjects were measured and entered in the spirometer.

Data Analysis

Data were expressed as mean ±SD. Mean values were assessed for significance by unpaired student –t test. A statistical analysis was performed using the Stastical Package for the Social Science program (SPSS, 23.0). Frequencies and percentages were used for the categorical measures. Probability values $p < 0.05$ were considered statistically significant.

Result and Discussion

The study was conducted in Amravati, Maharashtra. There are 100 traffic police officers participate in this study.

Table I. Shows Anthropometric measurements of traffic police office & control group

Parameters	Traffic Police Office	Control Group
Age	38.79 ± 7.79	40.53 ± 8.91
Weight in kg	70.95 ± 11.82	74.09 ±17.08
Height in cm	170.03 ± 4.79	164.2 ± 5.96

The average age of traffic police office was 38.79 ± 7.79 and control group was 40.53 ± 8.91, the height of Traffic police officer was 170.03 ± 4.79 and 164.2 ± 5.96 of control group, and weight of Traffic police office was 70.95 ± 11.82 and Control group was 74.09 ±17.08.

Various types of respiratory symptoms recorded in both traffic police officers and control group. It was observed that among the 100 traffic police officers examined, 37% reported having shortness of breath and 18.38% complained of frequent cough and in case of control group it was 9.38% had shortness of breath and 11.73% complained of frequent cough may be due to smoking. In the study conducted by Nihfir, N et. al.(6) showed that the 25% traffic police officers having shortness of breath and 8.33% complained of frequent cough.

The occurrence of shortness of breath was high among traffic police officers and occurrence of cough had higher value among controls. The values of Odds ratio for shortness of breath and frequent coughing were 1.96 & .058 respectively and shortness of breath shown significance increase in traffic police officers.

Table II showing Comparisons of CVS & Respiratory Rate in TPO and Control group

Parameters	Traffic Police Office	Control Group	'P' Value
Pulse per min	73.48 ± 3.49	75.08 ± 6.17	0.39
Respiratory rate	17.06 ± 2.03	14.79 ± 0.82	0.001
SBP(mmHg)	123.12 ± 6.19	128.14 ± 4.24	0.48
DBP(mmHg)	79.91 ± 6.94	84.34 ± 3.69	0.52

Table no II shows the pulse rate, respiratory rate, SBP and DBP in traffic police officers and in control group. The pulse rate, SBP and DBP was insignificantly decreased found in TPO it was 73.48 ± 3.49, 123.12 ± 6.19, 79.91 ± 6.94 respectively compare to control group and in control group it was 75.08 ± 6.17, 128.14 ± 4.24, 84.34 ± 3.69 respectively. But the respiratory rate was significantly increased found in TPO (17.06 ± 2.03) than control group (14.79 ± 0.82). The study conducted by Vijay Raina et. al[7] showed the pulse rate 72.8 ± 3.83, respiratory rate 16.86 ± 2.43, SBP 124.52 ± 5.79 and DBP was 80.36 ± 6.16 in TPO and concluded that PFT's of traffic policemen who are occupationally exposed to vehicular emissions and other dust have significantly reduced PFTs in comparison to healthy controls.

There has increase in automobiles in the last couple of decades with resulting in increase in air pollution levels. The present study examined respiratory health of TPO who constitute a high risk group in terms of health and occupation. They are exposed to diesel exhaust, toxic substances present in petrol, particulate matter and photoionizable dust.

Table. III Comparison of spirometry Parameters in TPO and Control group

Parameters	Traffic Police Office	Control Group	'P' Value
FVC	2.16 ± 0.58	4.12 ± 0.45	0.001
FEV1	2.12 ± 0.89	3.06 ± 0.19	0.05
FEV3	3.46 ± 0.67	2.98 ± 0.47	0.05
FEV1/FVC (%)	86.07 ± 22.24	92.24 ± 6.03	0.22
FEV3/FVC (%)	101.27 ± 0.48	100.86 ± 0.74	0.98
PEF (L/s)	9.33 ± 0.83	10.07 ± 0.86	0.06

The Spirometric parameters: FVC (L) (Controls 4.12 ± 0.45 vs TPO 2.16 ± 0.58), FEV1(L) (Controls 3.06 ± 0.19vs TPO 2.12 ± 0.89), FEV3 (Controls 2.98 ± 0.47vs TPO 3.46 ± 0.67)and PEF(L/s) (Controls 10.07 ± 0.86vs Traffic 9.33 ± 0.83) were compared among the traffic policemen (exposed) and control (none exposed) groups however the significant reduction had been noticed in FEV1 (p=0.038) in traffic police officers .

There was no much more difference in FEV3/ FVC in both the groups. Similar results were reported in some studies. Gamble *et al*[8] studied the chronic effects of diesel exhaust on respiratory system in 283 diesel bus garage workers and showed reduction in all pulmonary function parameters except FEF. Chawla et.al.[9] showed in

their study in petrol station workers reported decline in FVC and FEV1 but FEF 25-75% was the most affected pulmonary function parameter.

Comparison of PFT parameters among TPO in different groups, representing duration for which they have been on traffic duty revealed significant decreases, the magnitude of decrease in many PFT parameters being broadly correlated with the duration of traffic duty. This suggests that increase in the duration of traffic duty has increasingly harmful effect on lung function in TPO.

The Environment Protection Authorities in most states can predict when high levels of pollution will occur, and announce smog alerts. A summary of air pollution levels is sometimes presented in the news. Patients with asthma or other chronic lung diseases should notice whether they have more symptoms, worse lung function, or need more reliever medication on these days. If this does occur, they should stay indoors if possible[9].

If they have to go outdoors, they should avoid strenuous exercise. If problems still occur, they should ask their doctors to prescribe preventive medication. A more drastic solution is to move away from the traffic and out of the city. However, air pollution can travel considerable distances, and there may be other problems in the country such as high levels of grass pollen. The single most important thing to prevent lung cancer and many others cancers are not to smoke.

Conclusion

On the basis of our findings suggest that there is association between lung function deterioration and traffic police officers because of more exposure to polluted air and prevalence of eczema and allergic rhinitis are also highly found in traffic police officers and respiratory illness of traffic police officers is a highly considerable problem in Amravati traffic police officers.

References

1. Tuladhar B. Health impacts of Kathmandu's air pollution. Clean Energy Nepal, Environment and Public Health Organization. July 10, 2012.
2. PSR report, Coal's Assault on Human Health 2009.
3. World Health Organization. Burden of disease from joint effects of household and ambient air pollution for 2012. Cited 2015 Oct 31.
4. Ezzati M, Kammen D. Indoor air pollution from biomass combustion and acute respiratory infections in Kenya: an exposure–response study. Lancet 2001; 358: 619–24
5. Boehlecke BA, Merchant JA. The use of pulmonary function testing and questionnaires as epidemiologic tools in the study of occupational lung disease. Chest. 1981 Apr;79(4Suppl). PubMed PMID: 7471883.
6. Nihfir,N, Kartheepan,K, Aswer,M.I.M and Bavanandan,B. Assess The Impact Of Effects Of Vehicular Exhaust In Lung's Functions Of Traffic Police Officers Working At Batticaloa Town. 5th International Symposium 2015 – *Int Sym 2015, SEUSL; 179-184.*
7. Vijay Raina, Sunil Sachdev, Rajiv Kumar Gupta. Study of Pulmonary Function Tests of Traffic Policemen In Jammu Region. www.jkscience.org Vol. 16 No. 3, July - Sept 2014; 122-125.
8. Gamble JF, Jones W, and Minshall S. Epidemiological environmental study of diesel garage workers : chronic effects of diesel exhaust on the respiratory system. *Environmental Research* 1987; 44:6-17.
9. Chawla A, Lavania AK. Air pollution and fuel vapour induced changes in lung functions: Are fuel handlers safe? *IJPP* 2008; 52 (3) :255-61.
10. Lung Foundation Australia 18 October 2010.