



Assessment of lung function among urban station policemen

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Abstract : Background- Police officers are involved in difficult, stressful, demanding work. In addition to station duties they are also involved in patrolling, clearing traffics and crowd control and as such they are at risk of exposure to air pollution. So far, many pulmonary function studies have been done among traffic police personnel but since station police officer are also at risk of exposure to air pollution, this study was done to assess the pulmonary parameters of these police personnel. Aim- To assess the pulmonary functional status of urban station police officers. Materials and methods- The present study was carried out in 50 station police men in the age group of 30-50 years, of Chennai city, using a computerized spirometer. The pulmonary parameters assessed were FVC, FEV1 and FEV1 FVC ratio. Their mean values (SD) were compared with their predicted values and their statistical significance analyzed by using unpaired t-test. Results- The mean value of FVC was 3.01L and the predictive value was 3.41 L. There is a significant decrease in the FVC value (P value less than 0.001) of urban station police officers

compared to their predicted values. There was no significant change in FEV1/FVC ratio. Conclusion- Based on the above pulmonary parameters it was concluded that the urban station police men showed restrictive pattern (decreased FVC, normal FEV1/FVC ratio) of lung disease.

Keyword : Air pollution, Restrictive disease, Pulmonary function

INTRODUCTION:

The incidence of allergic respiratory disease such as asthma, bronchitis etc is increasing throughout the world and it is mainly seen in people living in urban areas than compared to rural areas. The outdoor air pollution resulting from rapid industrialization, explosive growth of population that leads to increased motor vehicle usage was the major contributing factor in urban areas. The World Health Organization has estimated that approximately 800 000 deaths were due to urban air pollution (WHO, 2002). So far, many pulmonary function studies have been done among traffic police personnel (Karita et al., 2001; Saenghiunvattana et al., 1995), because they work in the

busy traffic signal areas for years together and are exposed to risk of air pollution. But the station police officers are also involved in patrolling, clearing traffics and crowd control and as such they are also at risk of exposure to air pollution. So this study was done to assess the pulmonary parameters of these station police men in urban areas.

AIM:

To assess the pulmonary functional status of urban station police officers.

MATERIALS AND METHODS:

The present study was carried out in 50 station policemen in the age group of 30 – 50 years, of chennai city, using a computerized spirometer. **The study was conducted during the period February - March 2010. All the policemen were residing in Greams road police quarters, Chennai. They were posted out of station for 3 days in a week. All of them have similar duty timings. The pollution level in their residential area was SO₂ – 10.8 µg/m³, Nox- 32.8 µg/m³, Particulate matter size less than 10µm - 94µg/m³ and all of them have same level of exposure.** All the subjects were informed about the study and written consent was obtained from them.

Inclusion criteria

Station housed police men , age group 30 -50 years

Residential area - Police quarters, greams road, Chennai.

Duration of service 10 – 15 years

Exclusion criteria

Any pre-existing respiratory diseases like COPD, Tuberculosis, Corpulmon-ale

Any pre-existing cardiac problems

Acute respiratory infections

Smokers

Obesity

Skeletal deformity

Any history of chronic medication

The pulmonary function test was performed according to the method suggested by American Thoracic Society (1995). Each subject was asked to perform atleast 3 forced expiratory maneuvers to ensure reproducibility of results.

Procedure:

Patient should be seated comfortable and nose should be closed with a nose clip to prevent air entry through the nose.

The patient should take a deep breath and blow out as fast as and as quickly in to the mouth piece.

The flow volume loop was recorded.

The following pulmonary parameters were assessed

FVC- Forced vital capacity

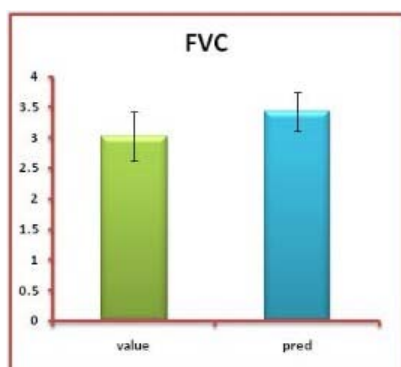
FEV₁- Forced expiratory volume during first second

FEV₁/FVC ratio

The mean values (±SD) were compared with their predicted values and their statistical significance analyzed by using unpaired T-test.

RESULT: The mean ± SD of FVC was 3.01±0.39L and the predictive value was 3.41±0.31L. There is a significant decrease in the FVC value (P<0.001) of urban station police officers compared to their predicted values. There was no significant change in FEV₁/FVC ratio.

RESULT: The mean $\pm$ SD of FVC was 3.01 ± 0.39 L and the predictive value was 3.41 ± 0.31 L. There is a significant decrease in the FVC value ($P < 0.001$) of urban station police officers compared to their predicted values. There was no significant change in FEV₁/FVC ratio.



DISCUSSION:

Urban air pollution is now considered as a serious public health problem. Many epidemiological studies have found a close association between the traffic exposure and development of respiratory symptoms (WJ SI, 1993). In obstructive lung disease FEV₁ is reduced more than FVC and FEV₁/FVC ratio is less than 70%, whereas in restrictive pattern FVC is less than 80% of predicted value. In the present study it was found out that there was a significant decrease in FVC, while the FEV₁/FVC ratio was normal. FVC denotes the functional capacity of the lung. Here 24% of policemen showed a reduction in FVC $< 80\%$, indicating that there is some degree of restriction. Similar finding have been observed in studies conducted in Kolkata (Lahiri et al., 2000ab) and Kanpur (Sharma et al., 2004). Pulmonary function test carried out among Bangkok traffic police men showed restrictive pattern as well as obstructive pattern of lung disease (Saenghirunvattana S et al 1995). Jindal et al., 2006 observed that

CONCLUSION:

Based on the above pulmonary parameters it was concluded that the urban station police men showed restrictive pattern (decreased FVC, normal FEV₁/FVC ratio) of lung disease.

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