

# Exposure to Vehicular Pollution and Respiratory Impairment of Traffic Policemen in Jalgaon City, India

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**Abstract:** The ambient air quality monitoring was carried during the May 2003 to April 2004 along the (NH-6) passing through Jalgaon city. The average concentration of SOx  $64 \mu\text{g}/\text{m}^3$ , NOx  $58 \mu\text{g}/\text{m}^3$ , particulates ( $>10 \mu$ )  $515 \mu\text{g}/\text{m}^3$  and respirable dust particulates  $224 \mu\text{g}/\text{m}^3$  was reported at Prabhat during the study period (May 2003–April 2004). This location represents the major highway crossings (four) in the study area. The present investigations are on the survey of health status and lung function of traffic policemen exposed to the inferior air quality as observed on the highway crossings. The spirometric analysis of traffic policemen shows significant variation in Peak Expiratory Flow Rate (PEFR), Forced Expiratory Volume in one second (FEV<sub>1</sub>) and Forced Vital Capacity (FVC). The parameters were significantly affected in the traffic policemen as against the control group of population. It reveals significant respiratory impairment in the traffic policemen due to exposure to vehicular pollution. The study suggest the compulsory use of personal protective equipment (nose mask) by the traffic policemen during duty hours will help for the protection from vehicular pollution. The regular periodic health checkup is required to understand the impact of vehicular pollution on the health of traffic policemen.

**Key words:** Pulmonary function, PM, SOx, NOx, Traffic-policemen

## Introduction

In urban areas mobile or vehicular pollution is predominant and significantly contributes to air quality problems. Road traffic produce volatile organic compounds, suspended particulate matter (SPM), oxides of sulphur (SOx), oxides of nitrogen (NOx), and carbon monoxide (CO), which makes adverse health effects on the exposed population. The particles emitted from the vehicular exhaust of more than 10-micron size are held in upper respiratory tract and particles less than 10-micron size (PM<sub>10</sub>) accumulates in the lung and produces respiratory abnormalities. Hence, PM<sub>10</sub> are of great concern in air pollution studies.

The effects of air pollution include breathing and respiratory problems, aggravation of existing respiratory and cardiovascular disease, alterations in the body defense

systems against foreign materials, damage to lung tissue, carcinogenesis and premature death<sup>1,2</sup>. The major subgroups of the population that appear to be most sensitive to the effects of particulate matter include individuals with chronic obstructive pulmonary, cardiovascular disease, influenza and asthmatics<sup>3,4</sup>.

The prevalence of obstructive, restrictive and mixed type of functional impairment of the lung was found to have direct relationship with the dust concentration and duration of exposure<sup>5,6</sup>. Prolonged exposure to dust can result in chronic bronchial problems<sup>7–11</sup>. Investigations of the respiratory health effects from vehicular pollution exposures are necessary in order to predict the risk factors that may cause an asthmatic response<sup>12–14</sup>. Several research works has confirmed the effects of air pollutants on respiratory function of human being. This study shows a link between exposure to vehicular exhaust and pulmonary function. Studies have shown reversible decrement in pulmonary function in the

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