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Particulate Matter and Their Effects on the Traffic Policemen

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ABSTRACT

Traffic contributes to a range of gaseous air pollutants and to suspended particulate matter (PM) of different sizes and composition. The effects on the health of transport-related air pollution are among the leading concerns about transport. Worsening situation of traffic congestion the streets and sufferings of the inhabitants from vehicle emissions demand extensive research in this field.

INTRODUCTION

In the coming decades, road transport is likely to remain a significant contributor to air pollution in cities. Road traffic produces a volatile organic compound, SPM, SOx, NOx, CO, which make adverse health effects on the exposed population. Traffic contributes to a range of gaseous air pollutants and to suspended particulate matter (PM) of different sizes and composition. The effects on the health of transport-related air pollution are among the leading concerns about transport.

In India, the status of airborne toxic elements at different land used pattern locations in major urban cities has been reported (49,22,24 25). Atmospheric deposition of trace elements like Pb, Cd, Cu, and Zn was studying at Deonar, Bombay, India. Presence of Toxic elements in the atmosphere is of great concern due to their adverse effect on human health and the ecosystem. Despite the requirement of some of the elements for all living organisms, certain elements cause various toxic effects on the accumulation in animal tissues (59). Research in recent decades consistently indicates the adverse effects of outdoor air pollution on human health. The evidence points to air pollution stemming from transport are an important contributor to these effects. Worsening situation of traffic congestion the streets and sufferings of the inhabitants from vehicle emissions demand extensive research in this field. Critical research issues include determination of whether the association is casual whether the exposure response relationship found at lower levels of pollution is similar to that observed in the more polluted cities and whether the association is strong in certain subgroups of the population. (5, 26, 43, 20). An increasing body of epidemiological data systematically demonstrates the adverse effect of air particulate matter on human health (7, 33, 32,46,27). In aerosol studies, these issues are largely addressed (23, 28, 34) and also in epidemiological studies health is increasingly associated with these two particle characteristics. (27,32).

Road traffic produces volatile organic compounds, SPM, SOX, NOX, CO which makes adverse health effects on the exposed population Okuda et al 2002, (36, 37, 3,). Jamhari et al, (29) also found out the combustion of motor vehicle emissions in a higher concentration of PAHs in Malaysia.

According to Chang et al 2004, (13) the major sources, PAHs in most Asian countries are traffic exhaust. Traffic on roads has significantly increased in the US and elsewhere over the past 20 years. (Schrank and Lomax, 2007). (44). In many areas vehicle emissions have

become the dominant source of air pollutants, including CO, CO2, volatile organic compounds or HCs, NOx, and PM (Transportation Research Board (TRB), 2002. The traffic police, especially the constables play a significant role to keep the traffic moving where the population density is very high (45).

This personnel has to undergo physical strain in the environment polluted by fumes exhaust of vehicles. Use of blowing horns, blow off dust in the air by a speeding vehicle, etc. all these factors pose as a health hazard (*2*). Traffic police had a higher prevalence of respiratory symptoms, such as cough and expectoration, these being similar findings to those reported by Karita in 2001 who contrasted occupational exposure to different levels of PM10 in three police groups' in Bangkok (31).

Fluorine was rich at heavy traffic and petrol station samples reflecting vehicular emission and combustion of coal and petroleum based fuels. (19,58). Although most of the traffic studies did not report association by gender, four did find adverse effects of traffic-related exposures in children to be stronger in girls than in boys. (40,54,6,38) while two others showed null results for both genders(18,55,17)**.**

Most of the studies still showed positive associations between traffic and respiratory outcomes. It is possible that associations between allergic respiratory illness and traffic density are due to NAAQS criteria air pollutants, particular NO2, which is directly related to local traffic density (42). Accurate estimates of human exposure to inhaled air pollutants are necessary for a realistic appraisal of the risks these pollutants pose and for the design and implementation of strategies to control and limit those risks. Except in occupational settings such estimates are usually based on measurements of pollutant concentration in outside (ambient) air, recorded with outdoor fixed site monitors.

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 tissues, carcinogenesis and premature death (9, 35).

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 (1, 17). The prevalence of the obstructive restrictive and mixed type of functional impairment of the lung was found to have a direct relationship with

the dust concentration and duration of exposure (10, 11, 56, 57). Cotes JE reported a decline in the perfusion of the lung by increasing age. (9,47)

Studies have proved that diesel vehicles emit fine and ultrafine particles in very large quantities (14). Prolonged exposure to dust can result in chronic bronchial problems (12, 16, 18, 41, 52). 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 (21, 48, 50). The study shows a link between exposure to vehicular exhaust and pulmonary function. Studies have shown a reversible decrement in pulmonary function in the population exposed to traffic pollution (51). The continuous vehicular exhaust inhalation can be leading the symptoms of the lower respiratory tract such as cough, shortness of breath and pain with inspiration (15,9,39). Age-induced asthma was also reported in the population by USNRCP (53).

As research consistently indicates the adverse effects of outdoor air pollution on human health and the evidence points to air pollution stemming from transport are an important contributor to these effects. Hence this kind of research is an invaluable piece for the betterment of the worsening situation of traffic congestion. Hence, this demands still extensive work in this field.

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