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Study of Poly Aromatic Hydrocarbons

"Case Study in Lucknow City (India)"

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Abstract

Air pollution is a mixture of natural and man-made substances in the air we breathe such as fine particles produced by the burning of fossil fuels, ground-level ozone, which is a reactive form of oxygen that is a primary component of urban smog, and noxious gases such as sulphur dioxide, nitrogen oxides, carbon monoxide, and chemical vapours, poly aromatic. The health effects of air pollution have been reported in research studies over the past 30 years. These effects include respiratory diseases such as asthma, cardiovascular diseases, changes in lung function, and death. The exposure to air pollution has long-term effects on lung development .Our study is mainly based on the study of pollution mask and how it is effective on asthmatics patient.

Keywords: PAHs, Smog, Gases, Primary pollutants and secondary pollutants.

1. Introduction

Air pollution in India is quite a serious issue with the major sources being fuel wood and biomass burning, fuel adulteration, vehicle emission and traffic congestion [1], [2]. In autumn and winter months, large scale of residue burning in agriculture fields - a low cost alternative to mechanical tilling - is a major source of smoke, smog and particulate pollution [3], [4], [5]. India has a low per capita emission of greenhouse gases but the country as a whole is the third largest after China and the United States [6]. A 1675 study on non-smokers has found that Indians have 30% lower lung function compared to Europeans [7]. Urban air pollution and its adverse health effects on the populations, has emerged as a serious and major global issue. We no longer need proof of the fact that polluted air is causing increase in respiratory ailments, heart disease risks, cancer and premature deaths [8]. There are many pollutants that have potential to cause hazards as shown in Figure 1.

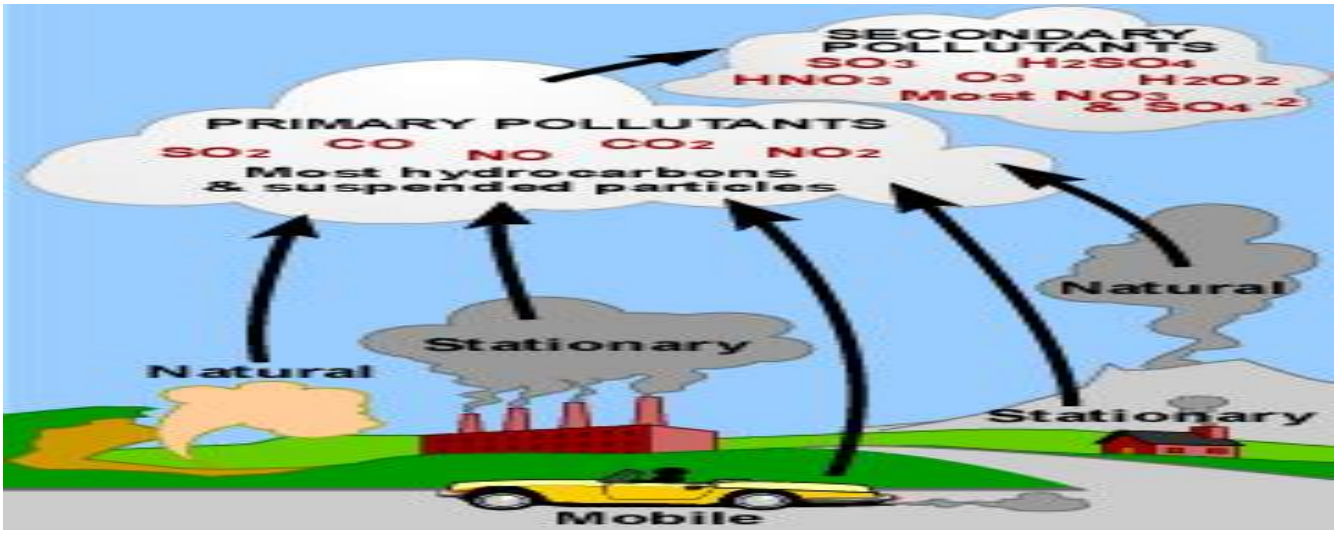

Figure -1: Different types of pollutants by stationary and mobile sources

Furthermore, air pollutants can cause lung disorder, premature death, cancer, chronic eye disorder, cardiovascular diseases and premature births etc as mentioned in Figure 2 [9].

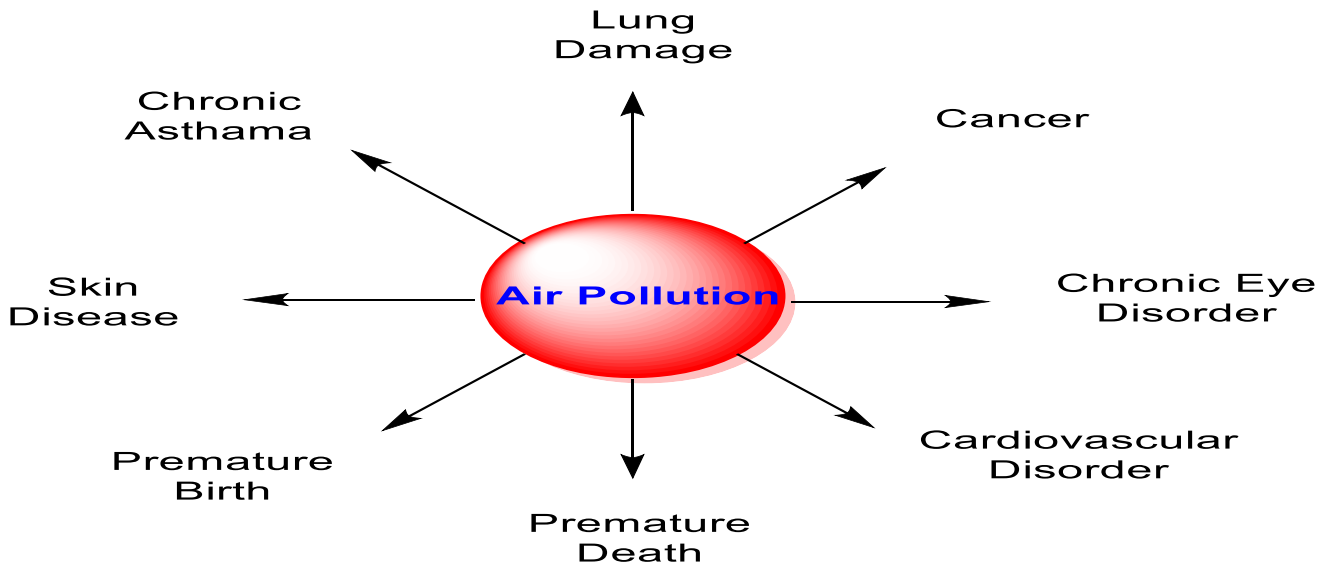

Figure -2: Air pollution and their effect on health

The traffic related emissions are enriched in metal contents, are directly linked to respiratory disorders in human subjects. Due to the over growth of traffic in India, this study was undertaken to estimate the PAHs exposure among non-occupationally exposed two wheeler riders of Lucknow City and related health effects through or with the of using face masks. In mask's we used the cellulose nitrate filters and also measured the lung capacity with the help of peak respiratory flow rate (PEFR). For this experiment we had selected 100 test subjects. PEFR test was conducted on each subject at the beginning, i.e. 0 day, and at end

of the study period, i.e. 30 days. After completion of the prescribed study period, filters from the used mask were collected, and treated with dichloro methane in soxhlet. This technique is quite helpful for those candidates suffering from asthama and other respiratory problems. We are facing many problems in which the most important issue is air pollution. Our study is mainly related to poly aromatic hydrocarbons and how its effect on the health of peoples especially on lungs, animals and the growth of plants.

Both indoor and outdoor air pollution have caused approximately 3.3 million deaths worldwide. Children aged less than five years that live in developing countries are the most vulnerable population in terms of total deaths attributable to indoor and outdoor air pollution [9].

2. Material and Methods

The 100 test subjects were selected. Some of them are suffering from asthama and few of them are passive smokers from all over the out skirt areas .We persued to use the mask for 15, 30,45 and 60 days on an average . The group was divided according to their exposure time period that may be 4-5 hours [10]. All the data were collected on survey proforma containing personal details eg. Physical, clinical, pre and post lung function status, etc. For knowing the lung status we were using PEFR (peak expiratory flow rate) instrument. With the help of this instrument, the capacity of lung can be calculated [11].

Figure -3: Peak expiratory flow gauge

3. Results

PEFR Table For those candidates suffering from asthma and few of them are non asthmatic:

Table1

PEFR VALUES

Days	Exposed for 4-5hrs (100)		Exposed for 6-8hrs (55)	
	Non asthmatic(62)	Asthmatic(38)	Nonasthmatic(25)	Asthmatic(30)
0	425	407	364	245.8
15	440	410	368.6	250.3
30	460	424	373.6	254.1

3. Discussions

The study was conducted for a test period of 15 days but was further extended to 30 days as most of the exposed subjects felt comfortable after using mask for 15 days. The recording of the PEFR values of each test subjects at 0, 15 and 30 days using Peak Flow Gauge M400 4K [3]. The symptomatic exposed for 4-5hrs group of subjects exhibited in the lung function status as compared to expose for 6-8 hrs as well as asymptomatic group of subjects.

It was observed that those who were using this pollution mask while doing work in factory, industry and driving their lung status improved. There is a slight difference in the reading of PEFR values especially in those who were suffering from asthma [12].

The utmost requirement is to collect better and systematic information about actual exposure levels experienced by households in different districts and climatic zones and develop a model for predicting the exposure levels based on fuel use and other household data therein (exposure at last) to protect the health of children, women and elderly persons. Still our work is continuing for the betterment of common person and we are trying to improve the quality of pollution mask.

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