Acta Ciencia Indica, Vol. XLIII C, No. 3, 393 (2017)

STUDY OF URBAN AIR POLLUTION AND THEIR EFFECT ON HEALTH WITH ITS PREVENTIVE MEASURES

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RECEIVED : 29, July 2017

Despite past improvements in air quality, very large parts of the population in urban areas breathe air that does not meet European standards let alone the health based World Health Organization Air Quality Guidelines. Air pollution can harm human health, the environment, and cause property damage. Various researches have proven the connection of air quality and human health. The epidemiology studies demonstrated that ambient air pollutants (PM, Ozone, Sulphur dioxide and Nitrogen dioxide etc.) contributed to various respiratory problems including bronchitis, emphysema and asthma. The objective of this paper is to discuss the relationship between the human health and air quality. This conceptual paper is focusing on the finding from air quality literature review and the significant health effects related to it.

KEYWORDS – Air pollution, Health effects, Particulate matter.

INTRODUCTION

Air pollution are basically the foreign material in the air, can be manmade or occur naturally, and are concentrated where people are concentrated. We are no longer as much in search of one substance in the atmosphere to account for the health effects of air pollution as we are in search of an understanding of the complex chemistry occurring in our dynamic atmosphere and the results of that chemistry on our health. But simultaneously we have become aware that we are no longer seeking one disease for which air pollution is solely responsible. Rather, there are numerous diseases [1-8] like lung cancer [9-10], asthma [11] and cardiovascular [12] in part caused by infection, by allergy, by cigarette smoking, by hereditary predisposition, by aging, to which air pollution may be only an added insult in the final outcome, a chain of events initiated by our birth, furthered by our habits and inexorably linked to the design of our industrial society. Pollution is injurious to health like respiratory system [13], nervous system [14], skin infection [15-16], heart infection [17], lung infection [18] and its prevention places an economic burden he citizen. Further emission reductions from automobiles, and transportation measures and programs will be more difficult to accomplish, but the challenge has been presented. The decision is up to the citizenry as to whether there shall be clean air for all.

Air pollution

Pollution is now a common place term that our ears are attuned to. We hear about the various forms of pollution and read about it through the mass media. Air pollution is one such form that refers to the contamination of the air, irrespective of indoors [19] or outside [20]. A physical, biological or chemical alteration to the air in the atmosphere can be termed as pollution. It occurs when any harmful gases, dust, smoke enters into the atmosphere and make it difficult for plants, animals and human health [21-31] to survive as the air becomes dirty. Things that pollute the air are called pollutants. Example of the pollutants include nitrogen oxides, carbon mono-oxide, hydrocarbons, sulpher oxides, sand or dust particles and organic compounds that can evaporate and enter the atmosphere. There are two types of pollutants- primary pollutants: these are those gases or particles that are pumped into the air to make it unclean like CO from automobile, SO^2 from the combustion of coal. And secondary pollutants- when pollutions in the air mix up in a chemical reaction, they form an even more dangerous chemical *e.g*. photochemical smog.

Table 1. Health effects of Air pollution

Toxic Agents	Sources	Adverse effects
Oxides of nitrogen	Automobile exhaust, gas stoves and heaters, wood-burning stoves, kerosene space heater	Respiratory tract irritation, bronchial hyperactivity, impaired lung function, bronchiolitis
Hydrocarbons	Automobile exhaust, cigarette smoke	Lung cancer
Ozone	Automobile exhaust, high altitude aircraft cabins	Cough, substernal discomfort, bronchoconstriction, decreased exercise performance, respiratory tract irritation
Carbon monoxide	Combustion, automobiles	Impaired neuropsychological development in children
Lead	Automobile exhaust using leaded gasoline	Impaired neuropsychological development in children
Sulphur di oxide	volcanoes, forest fire Automobiles, and domestic pollution	Nose, throat, and lungs diseases

CONTROL OF AIR POLLUTION

Activation carbon

Activated carbon is one of the most popular forms of air pollution control. This type of control involves the use of a pollution filter, carbon, to reduce the amount of pollutants that are allowed to escape into the air [32-33]. When in use, these filters absorb pollutants helping to cleanse the air of any possible toxins.

Biofiltration

Biofiltration uses microorganisms, often bacteria and fungi, to dissolve pollutants. Industries that employ biofiltration systems include food and waste plants, pharmaceutical companies and wastewater management facilities [34-35]. While this method of air pollution control works rather well, a large space is required in order to operate a biofiltration system. Many industries do not have this amount of available space, so this method is often disregarded.

Change in fuel

This technique involves the use of less polluting fuel to reduce air pollution. Use of low sulfur fuel instead of high sulfur fuel by electric utilities is an example of this method. Remember that low sulfur fuel is much more expensive than high sulfur fuel. Use of oil with low ash content or natural gas for a dryer at an asphalt plant to reduce particulate matter is another example of this method. Introduction of compressed natural gas, propane, ethanol and oxygenated fuels for automobiles have helped in the reduction of air pollutants [36].

Improve dispersion

This approach is based on the concept that dilution of air contaminants before they reach ground will lower the concentrations to which the population is exposed [37]. The use of this approach for industry is discouraged by the US EPA.

The emissions from the plant are passed through a control device before releasing to atmosphere. The pollutants are removed, destroyed or transformed in the control device before discharging into ambient air.

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