An Overview on Air Pollution and Its Effects

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ABSTRACT: ***Preventing air pollution is an expensive proposition for an individual and a nation on a global scale. Because air pollution is a hazard to both humans and the environment, it is critical to comprehend the underlying origins, causes, and health impacts connected with it. The general population, particularly those with upper or lower respiratory complaints, is aware that air pollution can cause respiratory problems, thanks to media reporting. Allergic physicians must be up-to-date on air pollution's health effects and how they may affect their patients in order to provide the best advice. Air pollution, its sources, its consequences, and how to eliminate it are the goals of this study. Air quality will be so bad by 2030 that breathing will need the use of an oxygen pack. Increasing air pollution will accelerate premature ageing. Human exposure to contaminants will skyrocket if air pollution isn't.***

KEYWORDS: Air Pollution, Acid Rain, Environment, Health, Ozone.

1. INTRODUCTION

Air pollution is defined as the presence of undesired elements in the environment in sufficient amounts to have severe health impacts on all living beings and the ecosystem, such as motor vehicle exhaust, industry emissions, and construction dust. As a consequence of severe health effects and other environmental issues such as global warming, impaired vision, and so on, air pollution has become a global concern in recent decades. There are fundamentally two causes of air pollution in the environment. The release of pollutants into the atmosphere that are detrimental to human health and the ecosystem as a whole is referred to as air contamination. According to the World Health Organizations, air pollution kills around seven million people each year throughout the world. Air pollution is defined as a mixture of solid particles and gases in the atmosphere. Automobile emissions, industrial chemicals, dust, pollen, and mould spores can all cause particles to be suspended. Ozone is a gas that contributes significantly to pollutant emissions. Smog is the word for ozone-induced air pollution[1].

There are several pollutants in the air that might be hazardous. The two forms of air pollution are primary or secondary air pollution. Primary pollutant are those that are released directly from sources, such as automobile exhaust, industry, or the burning of fossil fuels. Only a few of these are hydrocarbons, carbon dioxide, carbon monoxide, sulphur dioxide, nitrogen oxide, as well as particulate matter. Sulphuric acid, ozone, peroxy-acyl-nitrate (PAN), as well as other secondary pollutants are produced by interactions between primary pollutants, water vapour, but also sunlight[2].

1.1. Types of air pollutant:

There are two diverse kinds of the air pollutant.

1.1.1. Primary pollutants:

Primary pollutants are those that directly contribute to air pollution. Sulphur dioxide, which is generated by industries, is a major pollutant.

1.1.2. Secondary Pollutants:

Secondary pollutants are those that result from the mixing and interaction of main pollutants. Smog is a secondary pollutant that results from the mixing of smoke and fog.

1.2. Causes of air pollution:

1.2.1. Fossil Fuel Burning:

The combustion of fossil fuels produces a significant amount of sulphur dioxide. Incomplete burning of fossil fuels releases carbon monoxide, which pollutes the air.

1.2.2. Automobiles:

Vehicles such as jeeps, trucks, automobiles, buses, and other vehicles generate gases that harm the environment. These are the primary sources of greenhouse gases, as well as the causes of sickness in humans.

1.2.3. Agricultural Operations:

One of the most dangerous chemicals released during agricultural activities is ammonia. Insecticides, pesticides, and fertilizers pollute the atmosphere by releasing hazardous chemicals.

1.2.4. Factories or Industries:

Carbon monoxide, organic compounds, hydrocarbons, and chemicals are mostly produced in factories as well as industries. These are released into the atmosphere, causing it to deteriorate in quality.

1.2.5. Domestic Sources:

Toxic chemical are discharged into the air by domestic cleaning products and paints. The odour emanating from freshly painted walls is due to the chemicals included in the paints. It not only pollutes the air, but it also makes it difficult to breathe.

1.2.6. Mining Activities:

The minerals under the earth's surface are removed utilizing huge pieces of equipment during the mining operation. The dust and chemicals generated during the operation not only contaminate the air, but they also harm the employees' and neighboring residents' health.

1.2.7. Air pollution and sources as well as trends:

Any unfavourable change in the air produced by substances that are toxic or may be harmful to health, or that are offensive but not necessarily hazardous to health, is referred to as air pollution. These substances can be solids, liquids, or gases, and are frequently a mixture of all three. Particulate matter, nitrogen dioxide, carbon monoxide, sulphur dioxide, ozone, volatile organic compounds, as well as other pollutants are examples of air pollutants. Particulate matter, CO, NO2, SO2, and O3 are the most often investigated air pollutants in relation to stroke. Particulate matter is a combination of components of varying sizes, shapes, and chemical compositions[3].

1.3. Air Pollution Challenges and Common Pollutants:

Even when it is not apparent, air pollution may be dangerous. Some contaminants can affect public health and wellbeing even at extremely low levels, according to newer scientific research. In recent years, the Environmental Protection Agency (EPA) updated criteria for five of the six most prevalent contaminants subject to national air quality guidelines. Because fresh, peer-reviewed scientific research indicated that previous requirements were insufficient to safeguard human health and the environment, the EPA strengthened the standards[4].

1.4. Effect of Air pollution:

A variety of air pollutants have been recognized as having negative health and environmental consequences. In most regions of Europe, these pollutants are mostly produced by combustion in the form of space heating, power generation, or motor vehicle traffic[5]. Pollutants emitted by these sources might create issues not just in the immediate vicinity, but also across long distances. Effects of air pollution on human health show in Table 1.

Table 1: The table below demonstrates the many sorts of health impacts that the most prevalent pollutants have at high doses.

Pollutant	Health effects at very high levels
Nitrogen Dioxide, Ozone, Sulphur Dioxide.	These gases irritate the lungs airways, exacerbating the symptoms of people with lung disorders.
Particles	It is possible for fine particles to penetrate deep into the lungs, where they might cause inflammation and aggravate heart
Carbon Monoxide	As a result, oxygen cannot be absorbed by the blood In individuals with heart disease, this could result in a significant reduction in oxygen delivery to the body's organs

1.5. Best Ways To Reduce Air Pollution:

1.5.1. Taking public transportation:

Using public transit, which uses less gasoline and energy, is a sure-fire way to help reduce air pollution; even carpools can assist. Taking public transit may save you money while also lowering the amount of fuel and gas emitted into the atmosphere.

1.5.2. Turn Off The Lights When Not In Use:

The energy used by lighting contributes to air pollution, thus reducing power usage can help conserve energy. To assist the environment, use energy-saving fluorescent lighting.

1.5.3. Recycle and reuse:

The idea of recycle and reuse not only helps to preserve resources and utilize them wisely, but it also helps to reduce pollution emissions, which is good for the environment. The recycled products also take less power to make other products.

1.5.4. No to plastic bags:

Plastic items are potentially damaging to the environment since they take a long time to degrade owing to their oil-based composition. Instead, paper bags are a preferable option since they disintegrate quickly and are recyclable.

1.5.5. Reduction of forest fires or smoking:

Garbage collection and burning during dry seasons, as well as dry leaves igniting fires, are major contributors to air pollution. Additionally, smoking contributes to air pollution and worsens air quality, as well as harming one's health.

1.5.6. Use fans instead of air conditioners:

Using air conditioners consumes a lot of energy and produces a lot of heat, both of which are harmful for the environment. When compared to fans, air conditioners need a lot more electricity and energy to operate.

1.5.7. Avoid using crackers:

Sadly, the use of crackers at festivals and weddings is one of the major causes of air pollution, resulting in a layer of haze that is very hazardous to one's health. As a result, it is recommended that no crackers be used.

1.5.8. Avoid using goods that include chemicals:

Products that contain chemicals or have a strong odour, such as paints or fragrances, should be used sparingly or outside the home.

1.6. Environmental Effects.

1.6.1. Acid Rain:

Acid rain is a form of precipitation that contains high quantities of nitric and sulfuric acids, which can be harmful. These acids are formed when fossil fuels are burned and nitrogen oxides or sulphur oxides are discharged into the atmosphere. These acids might fall as wet precipitation (rain, fog and snow) or as dry precipitation (snow, ice, or fog). Acid rain damages plants and causes soil and water bodies to become acidic, making the water unsuitable for some fish as well as other creatures. It also hastens the decay of national artefacts including buildings, monuments, or sculptures. The environment has been damaged by acid rain.

1.6.2. Wildlife impacts :

Animals can be affected by toxic pollutants in the air, as well as those deposited on soil or surface water. When animals, such as people, are exposed to excessive amounts of air toxics over time, they might develop health issues. Air toxics have been linked to birth defects, infertility, and sickness in people and animals, according to research. Hazardous air contaminants that persist (those that take a longer time to degrade in the environment). These variables are especially important in aquatic situations. The environment is polluted by these chemicals. collect in sediments and may bio magnify to concentrations many times higher than those present in groundwater or the atmosphere in the organs of top-of-the-food-chain organisms[6].

1.6.3. Crop or forest damage:

Air pollution has a range of consequences on crops or plants. Ground-level ozone has been related to lower agricultural crop as well as commercial forest yields, as well as impaired tree seedling growth and survival and increased plant mortality. Wheat is vulnerable to disease, pests, and other environmental stresses (such as extreme weather). Acid rain may also affect agriculture and forests, as previously noted. There is increased UV radiation as a result of ozone depletion.

1.6.4. Ozone depletion:

ozone is a naturally occurring gas that may be found on Earth's surface as well as in its higher atmosphere, the stratosphere It is a pollutant that can have a negative impact on human health at ground To counteract the negative effects of the sun's ultraviolet rays, a Life on Earth is endangered by UV (ultraviolet) radiation from the sun's "Good" ozone, on the other hand, is not without its Man-made compounds known as ozone-depleting chemicals are progressively destroying the ozone layer. Chlorofluorocarbons, hydrochlorofluorocarbons, and halons are examples of such compounds. These chemicals were once used as coolants and are still used on occasion. Foaming agents, solvents, fire extinguishers, insecticides, and propellants for aerosols are just a few examples.

2. LITERATURE REVIEW

Roberto Danovaro et al. studied about the dangers of pollution in the Mediterranean Sea. This review summarizes current information on key causes of pollution in the Mediterranean Sea that are of concern. As a result of the Mediterranean's unique natural features, the effects of eutrophication, red tides, organic load, hydrocarbon spill, and heavy It refers to the introduction of biologically active chemicals that may have synergistic effects with traditional contaminants. A lot of time will be spent on this issue. Make comparisons between different compartments and the marine ecosystem as a whole. On top of that, anthropogenic effect is examined. Other topics covered include potential monitoring techniques and remedial actions for a sustainable management of polluted maritime zones[8].

Nikhil Sharma et al. studied about prevention of air pollution that is an expensive proposition for an individual or a nation on a global scale. Because air pollution is a hazard to both humans and the environment, it is critical to comprehend the underlying origins, causes, and health impacts connected with it. This book provides an overview of air pollution and recommends appropriate preventative strategies for air pollution reduction. Air pollution from internal combustion engines (IC engines), primary organic aerosols (POAs), the health effects

of volatile organic compounds (VOCs), and even advanced subjects such as numerical simulation of airflow in hospitals are all covered in this book. This article also discusses different engine technologies for reducing air pollution from the road transportation sector, including multipoint port fuel injection (MPFI), common rail direct injection (CRDI), indirect injection engine (IDIE), or gasoline direct injection (GDI). Another hazard to human life as well as the environment is nuclear contamination[9].

Janaki Gokhale et al. studied about outdoor air pollution is a major public health concern in major cities across the world. It has been known for millennia that air pollution is a serious issue There is a strong link between air pollution and a wide range of health issues, according to decades of research. Although air pollution poses a threat to health, it is rarely addressed by health care professionals during patient care. As a result of this study, front-line physicians will have access to important information Air pollution and its health effects are examined from a scientific perspective. In this section, you will learn about the dangers of present air pollution to An introduction to the role of various pollutants on outdoor air quality[7].

Jianzhou Wang et al. studied about air pollution that is described as a phenomena that is damaging to the ecological system as well as normal human existence or development when the concentration of certain chemicals in the atmosphere exceeds a particular level. Scholars have performed a large amount of relevant study in the face of increasingly critical environmental pollution concerns, or air pollution forecasting has been of crucial relevance in those studies. As a precaution, air pollution forecasting is the foundation for implementing effective pollution management measures, as well as accurate air pollution forecasting has become a critical responsibility. This research examines the theory and implementation of air pollution forecasting models in order to offer a thorough picture of the subject. Furthermore, the pros and disadvantages of various forecasting approaches are presented based on a comparison of different forecasting systems. This research intends to give academics a summary of air pollution forecasting methodologies for simple access which will be useful in future research[10].

3. DISCUSSION

Environmental pollution is a common problem that is likely to have a negative influence on human health. Air pollution is now widely acknowledged as a major risk factor for stroke. Industry, road transportation, and residential use of biomass or solid fuels are all causes of air pollution. Although early epidemiologic studies of air pollution's impacts on human health only offered associative data, the body of present scientific evidence today clearly delineates the function of pollutant-mediated unfavorable interactions in human allergic airway disorders. The first time a relationship between air pollution and stroke was discovered was in studies looking at the health consequences of severe pollution episodes. Stroke has been linked to a variety of daily time series or case-crossover studies As of now, air pollution appears to be a significant cause of stroke. Studies on the effects of acute exposure are rising in number. Less conclusive evidence exists for chronic exposure, and further study is needed to Air quality reduction should be considered as a preventive measure to reduce stroke risk worldwide, despite the lack of data to support.

4. CONCLUSION

Polluted ecosystems appear to be a global issue, with even greater implications for the international community than they have previously suffered. Pollution control programs develop as a national fixed-cost-sharing effort that relies on voluntary participation since successful pollution response is largely based on human evaluation of the situation. Air pollution is now widely acknowledged as a major risk factor for stroke. While early epidemiologic studies of air pollution's impacts on human health only offered associative data, the body of current scientific evidence today clearly delineates the function of pollutant-mediated unfavorable interactions in human allergic airway disorders. Industry, road transportation, and residential use of biomass or solid fuels are all causes of air pollutions. People and nations throughout the world spend a lot of money trying to prevent air pollution. Because air pollution is a threat to both individuals and the environment, it is important to understand the fundamental origins, causes, and health consequences associated with it. As of now, air pollution appears to be a significant cause of stroke. Air pollution reduction should be considered as a preventive measure to reduce stroke risk worldwide, despite the lack of data to support The aim of this article is learn about air pollution, causes of air pollution, impacts of air pollution as well as how to decrease air pollution in a pragmatic manner.

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