How Smog affect Human Health?

Smog is visible air pollution causing fog like situation. Smog is derived from “smoke” and “fog”. Smog can be seen in many metropolitan cities across the globe and in recent years, it has been increasing seen in developing countries. It is associated with many hearth hazards as we discuss later in this article.

Component of smog:
The actual concentration of different gases and chemicals in smog can vary but mostly smog is constituted by

1. Sulphur oxides
2. Nitrogen oxides
3. Water contents/high humidity
4. PM2.5 and PM 10
5. Organic volatile acids
6. Aldehydes
7. Hydrocorbans
8. Seconadary pollutants like ozone

We can divide smog into two broad categories. Winter and summer smog

Winter Smog:
Winter smog is formed during colder temperature (Nov-Jan) in Asian countries. It is primary driven by high sulphur oxides being emitted from burring of fossil fuels (diesel, gasloline, natural gas) in cars, trucks and buses. Natural gas use is also increased to heat up the houses. It is complicated by emission from industries, burning of crops and brick kilns. Dust also plays a role. In cold temperature, atmospheric inversion plays an important role in formation of a layer of hot air above cold air above the surface of earth which traps these chemicals close to surface of air. Low wind speed cause poor dispersion during colder months.

Summer Smog:
Summer fog is also called photochemical smog. It is primarily driven by emission of nitrogen oxides (as compared to sulphur oxides in winter smog) and hydrocarbon released by the burning of fossil fuel. A strong chemical reaction leads to formation of toxic gas, called ozone, close to the surface of the earth which has many hazardous effects on human health. There are other constituents of this sfog too including dust, carbon particles and particular matters.

Particulate Matter:
PM2.5 are ultrafine particles, thinner than hair, and these can travel all the way to end of lungs where gas exchange happens. These can penetrate the lung lining and can go around the body in the blood. These accelerate the damage/narrowing of blood vessels, increasing the risk of heart and brain diseases (heart attacks, stroke, memory issues and Parkinson disease).

PM10 are larger particles which do not pass through the lining of lungs but do deposit in the airways, inducing inflammation, mucus production and may lead to asthma and chronic bronchitis.

These have been many major report smog related episodes causing deaths of thousands of people during these episodes across the globe. Great London's smog, in 1952, is one of such events.

In recent years, we are seeing increasing smogs incidents in Lahore and New Delhi.

Health effects of Smog:
There are plentiful health hazards related to inhalation of primary and secondary pollutants along with particulate matters in the air.

1) **Respiratory issues**
    - Chronic bronchitis or cough
    - Asthma
    - COPD
    - Increased risk of lung cancer
2) **Cardiac issues**
    - Increased blood vessel narrowing
    - High blood pressure leading to increased risk of heart attacks
    - Increased risk of brain haemorrhage
3) **Eyes**
    - Irritation
    - Increased risk of infections
4) **Cancers**
    - Increased risk of lung cancer, breast cancer, lymphoma, leukemia
5) **Nose and sinus issues**
    - Increased risk of acute and chronic nose and sinus irritation
    - Chronic rhinitis and sinusitis
    - Frequent throat clearing and postnasal drip
6) **Pregnant ladies**
    - Smog has many adverse effects on developing babies inside the uterus including low preterm weight, preterm birth and other increased risks of complication during delivery
7) **Effects on children**
    - Children living with poor air quality areas are susceptible to increased nose and sinus issues, causing school absentees, affecting performance
    - Increase risk of developing asthma
    - Also affect their brain development
8) **Skin issues**
    - Increased risk of skin diseases, including dryness, chronic itch, and eczema
9) **Elderly population**
    - Increased risk of memory problems and development of Alzheimer's dementia
    - Increase risk of stroke and brain haemorrhage

- Increased risk of Parkinson disease

How to avoid smog:
If someone is living in high pollution/smog area, we cannot avoid it altogether. One can reduce the effects by wearing a mask when doing outdoor activities and wearing googles to protect eyes. Staying indoor with close windows will help reduce the impact. Air purifier/conditioning may help inside the buildings.

If someone has lung or heart disease, it is important to be complaint with medicines, to reduce the impact on one's health.

If you are suffering from smog related health problems, you can contact your physician for further assessment and advice. It is important to mitigate the increased risks of developing diseases in later life.

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