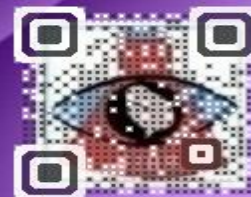


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Editorial by Anirban Sukul PhD

Air pollution caused due to fire crackers during the festive season in India

Director, Sukul Institute of Homeopathic Research Kolkata, India

anirsukul@gmail.com www.sukulhomeopathy.com



per capita emissions of greenhouse gases but *the country as a whole is the third largest after China and the United States*. A 2013 study on non-smokers has found that Indians have 30% lower lung function compared to Europeans.

KEY WORDS: Air pollution, Noise pollution, Prevention, Fire crackers

SUMMARY

Diwali (Deepawali) is an Indian festival celebrated by lighting lamps, distributing sweets and bursting crackers. By tradition homes are lit with clay lamps, candles fairy lights, and fire crackers light the sky as people rejoice in the festival. Over the years, the bursting of fire crackers has reached high noise levels and air pollution during Diwali. Let us have a look at the various toxic chemicals, increasing levels of pollution and the methods to celebrate eco-friendly Diwali.

CAUSES

Air pollution occurs when harmful or excessive quantities of substances including gases, particulates, and biological molecules are introduced into Earth's atmosphere. It may cause diseases, allergies and even death to humans; It may also cause harm to other living organisms such as animals and food crops, and may damage the natural or built environment. Both human activity and natural processes can generate air pollution.

Anthropogenic air pollution Sources are:

- Combustion of fossil fuels, like coal and oil for electricity and road transport, producing air pollutants like nitrogen and sulfur dioxide.
- Emissions from industries and factories, releasing large amount of carbon monoxide, hydrocarbon, chemicals and organic compounds into the air.

INTRODUCTION

Air pollution can be defined as an alteration of air quality that can be characterized by measurements of chemical, biological or physical pollutants in the air. Therefore, air pollution means the undesirable presence of impurities or the abnormal rise in the proportion of some constituents of the atmosphere. It can be classified in 2 sections: **visible** and **invisible** air pollution.

Air pollution is caused by the presence in the atmosphere of toxic substances, mainly produced by human activities, even though sometimes it can result from natural phenomena such as volcanic eruptions, dust storms and wildfires, also depleting the air quality.

Air pollution is a serious issue with the major sources being fuel wood and biomass burning, fuel adulteration, vehicle emission and traffic congestion. In the autumn and winter months large scale crop residue burning in agriculture fields – a low cost alternative to mechanical tilling is a major source of smoke, smog and particulate pollution. India has low

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- Agricultural activities, due to the use of pesticides, insecticides, and fertilizers that emit harmful chemicals.
- Waste production, mostly because of methane generation in landfills.

Increasing pollution on Diwali

Unfortunately, every year the quantum of air and noise pollution caused due to the bursting of firecrackers increases on Diwali. Firecrackers release pollutants such as sulphur dioxide, carbon dioxide, carbon monoxide etc in the air, which causes ailments like asthma and bronchitis. Last year, the air pollution levels had risen than any other years in past. The 2013 Diwali witnessed, the respirable suspended particulate matter (RSPM) levels at 236.2 microgram per cubic meter during Diwali; while the SO_x (oxides of Sulphur) levels of 48.7 microgram per cubic meter during the festival. The NO_x (oxides of Nitrogen) 35.3 microgram after the festival.

Chemicals in fire works

Heavy Smog hangs low in the air on Diwali night and few days after that. The levels of sulphur, nitrates, magnesium, nitrogen dioxide increase, and these chemicals are injurious to our respiratory passages. Diwali can be potentially fatal to asthmatics.

The various chemicals in fireworks and their effects –

- **Sulphur dioxide:** Causes wheezing and shortness of breath.
- **Cadmium:** Can cause anemia and damage to kidney and also affect the nervous system.
- **Copper:** Irritates respiratory tract
- **Lead:** Affects the nervous system
- **Magnesium:** Can cause metal fume fever
- **Nitrate:** Can cause mental impairment
- **Nitrite:** Can cause skin problems, eye irritation, and respiratory problems in children.

These are just the things that happen on the day of Diwali. The real problem comes after the day. The

roads are filled with bits of paper and plastic. Approximately 4000 additional metric tons of garbage are released in Delhi alone, and twice the amount in Mumbai. In Bangalore, garbage collection is increased by 800 to 1000 tons during these times whereas Chennai produces 50 tons more of this garbage. That's a lot of scrap!

Also the noise pollution it creates cannot be overlooked, fireworks can create 140 decibels of noise (noise at 85 decibels or above can damage hearing). Diwali is a nightmare for dogs and other animals who get scared of loud sounds (dogs can hear 4 times more than us, imagine the pain and agony).

There is another disturbing fact related to fireworks used during Diwali. More than 80 million children are employed in the firework industry around the world; Majority being in India. Asthma and TB is prevalent among 90 per cent of them who are involved in gun powder filling and are directly in contact with the chemical ingredients of crackers. So buying fireworks indirectly contributes to child labour. Buying crackers is an utter waste of money and is harmful for the environment too.

Alternative medicines particularly Homeopathy plays an important role in combating the respiratory disorders that the doctors mostly get the patients after the festival is over.

Children and geriatrics are the most sufferers from air and noise pollution.

There are potential medicines in Homeopathy like *Carbo veg*, *Nux vom*, *Thuja*, *Bryonia*, *Causticum*, *Ars alb*, etc., mostly used in lung disorders.

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