

OCCUPATIONAL HAZARDS DUE TO CHEMICAL POLLUTANTS IN AIR

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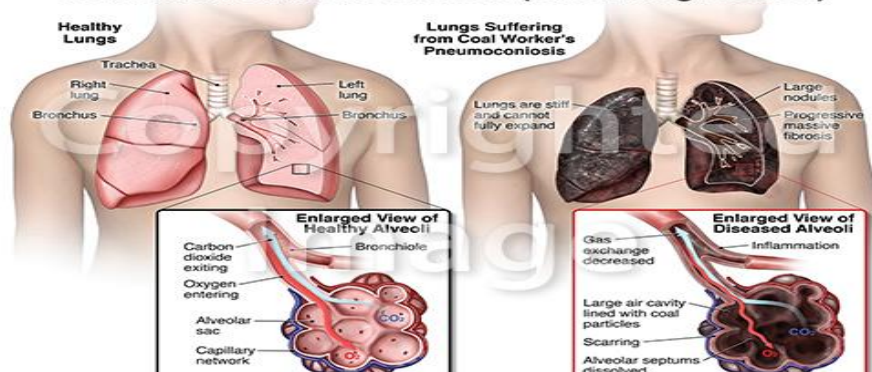
Introduction

Contamination of air with the aid of using various toxic chemicals being spewed in the atmosphere has been a cause of serious disease problems. Studies indicate that there is a direct (positive) correlation exists between an increased air pollution and enhanced human and animal morbidity and mortality. Diseases like persistent bronchitis (asthma) and primary lung cancer have been attributed to growing prevalence of air pollutants. Most common air-borne chemical hazard is lead toxicity. The greatest lead polluter in the air is petroleum. Thousands of tonnes of lead are released by the automobiles all over the world every year. Manufacturing processes emitting lead compounds in both organic and inorganic forms, compound this hazard and causes severe systemic toxicity in both man and animals. Use of unleaded petrol and better emission control methods have been recommended to tackle this problem. In many regions of the country, unleaded petrol has been made available.

List of occupational hazards is as follows:

- 1. Pneumoconiosis.** Pneumoconiosis is a ailment situation in human beings as a result of inhalation of dust particles (below 3μ) over a period of exposure. This situation is largely an occupational risk. A number of respiratory dysfunctions is the result of inspired small size dust particles leading to the lung alveoli. The situation step by step reduces the operating potential of lung because of the improvement of lung fibrosis and different complications.

Coal Worker's Pneumoconiosis (Black Lung Disease)



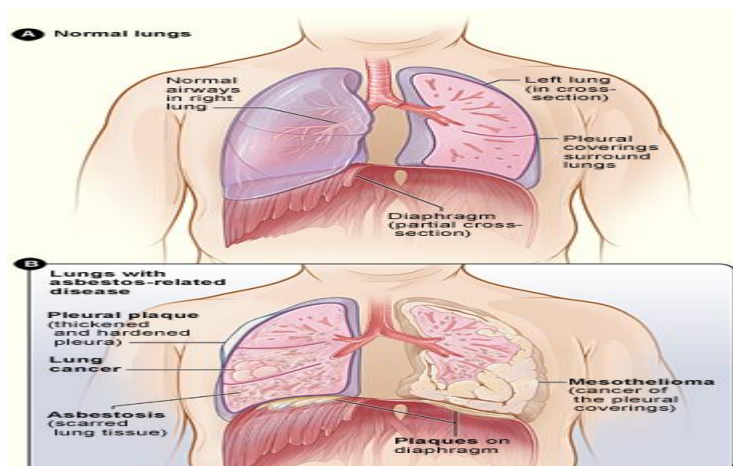
Various forms of pneumoconiosis have been described depending on the composition of dust.

1. **Silicosis:** It is caused by dust containing free silica or silicon-dioxide. It is encountered commonly in the workers employed in various mines, viz., coal, mica, gold, silver, zinc and manganese mines and in industries like pottery and ceramics, construction work, sand blasting, metal grinding, rock mining, etc. Particles between 0.5 to 3.0 μ are the most dangerous as they reach the interior of the lung with ease. The initial symptoms are, irritating cough, dyspnoea and pain in the chest. Chronic exposure results in impairment of the total lung capacity due to fibrosis. Silicosis predisposes to tuberculosis, which may adopt a fatal course. There is no effective treatment of silicosis. The only way by which silicosis can be controlled is through the application of vigorous dust control measures and regular physical examination of workers.



2. **Asbestosis:** Asbestosis a silicate, is highly resistant to heat and moisture making it a deadly hazard. The dust deposited in the lungs causes pulmonary fibrosis leading to

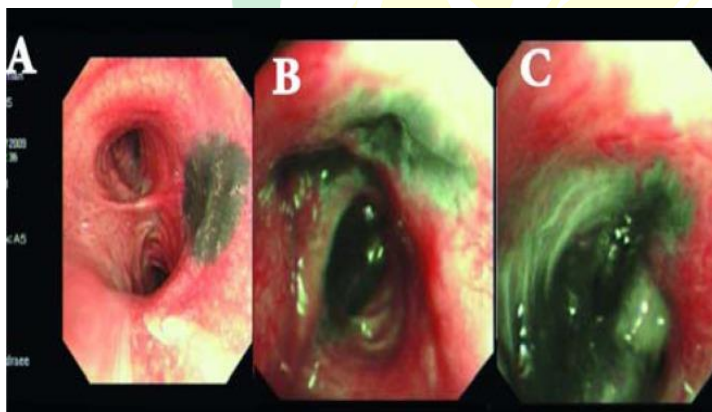
respiratory insufficiency and death. In most severe cases it causes cancer of bronchi and gastrointestinal tract called mesothelioma. Asbestosis has distinct symptoms: a cracking sound while breathing and finger clubbing- a thickening around the base of the nails. The only way of preventing asbestosis is the use of respirators and air filters and education of the workers regarding the hazards of asbestosis.



- 3. Byssinosis:** Inhalation of cotton dust for a longer duration causes Byssinosis. Cotton fibres give off a lot of dust as it is processed and cleaned. Byssinosis afflicts the workers employed for more than 10 years. The workers start wheezing and coughing soon after they start work. These symptoms wear off gradually as the day goes on due to acclimatisation. The disease is progressive in nature and in due course of time it causes permanent breathlessness and shortens the victim's life span. The minute size of the cotton fibres makes it go undetected even under X-ray and it becomes very difficult to distinguish it from a case of chronic bronchitis and emphysema. Regular physical check-up of the workers and use of respirators and air filters can reduce its harmful effect on the workers.



4. **Anthracosis:** Anthracosis is caused by the constant inhalation of coal dust which results in its accumulation in the lungs giving the disease the name, black lungs. In addition to respiratory problems, anthracosis predisposes a person to an array of infectious diseases like tuberculosis. Further exposure to coal dust may result in massive fibrosis of the lungs resulting in severe respiratory disability and premature death.



5. **Bagassosis:** Bagassosis is the name given to the occupational disease of the lung caused by inhalation of bagasse or sugar cane dust. It is caused due to fungus Actinomyceete and the symptoms consist of breathlessness, cough, haemoptysis and slight fever. In untreated cases, there is a diffused fibrosis, emphysema and bronchiectasis. The preventive measures include dust control, regular medical check-up of workers and bagasse control by keeping moisture below 20% and spraying 2% propionic acid, a widely used fungicide.



CONCLUSION

While the effects of air pollution on materials, vegetation, and animals can be measured, health effects on humans can only be estimated from epidemiological evidence. Most of the evidence comes from occupational exposure to much higher concentrations of pollutants than the general public is exposed to. The composition and concentrations of the different components in indoor air vary widely and are influenced by human activities. Since it is not feasible to regulate all possible scenarios, prevention from possible health effects and protection of sensitive populations is best achieved by reducing exposure. Constructors, maintenance personnel and inhabitants should also be aware that appropriate humidity avoids annoyances and sufficient air exchange reduces accumulation of pollutants.