

## ENVIRONMENTAL POLLUTION AND HEALTH

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The earth will no longer support any form of life if man continue to pollute the environment. In this paper I shall try to cite some examples of pollution and its relationship to the medical profession.

Lead poisoning is the oldest record in the history of pollution affected man. Ancient Romans used to line the bowls, pitchers, plates, cups and spoons of the upper class with lead. After frequent use of these utensils lead poisoning affected the emperors and their knights and caused their death at an early age<sup>1</sup>.

Compounds with similar structure to oestrogen are known to bind to oestrogen receptors and produce similar action to oestrogen<sup>2</sup>. Evidence suggests that many chemical pollutants act like oestrogen thus threatening the reproductive system and the virility of man. Researchers indicate that the average male sperm count has decreased by 50% since World War II and testicular cancer has trippled<sup>3</sup>. Compounds suspected to act as environmental oestrogen include polychlorinated biphenyls, polybrominated biphenyls (PBBs), endosulfan, atrazine polycarbonate plastics and some chlorine compounds. The major sources of these compounds are the herbicides, pesticides, industrial solvents and chemicals.

In Michigan 1978, the cattle feed was contaminated with PBBs. It was found that women who consumed the cattle meat have an increased level of PBBs in their milk and showed higher incidence of children with penile and testicular malformation. Women in China showed the same phenomenon after being exposed to PBBs. In England men drinking contaminated Thames water showed much lower sperm count than those drinking uncontaminated water.

It has been discovered that the production of alligators in Florida Lake have decreased, their penises half of the normal size and had low sperm count with poor mobility. Furthermore, in some areas of England, the river male trouts are changing sex and therefore the reproduction of trouts has decreased. One factor was revealed in common that the water was polluted with nonylphenol, an industrial substance which is supposed to be phased out by the year 2000. How much irreversible damage was done by then?

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Nonylphenol is an industrial substance which acts as endocrine disrupter, acting like oestrogen stimulating the production of vitillegenous hormone which stimulate the production of eggs and suppress the production of sperms in the fish and therefore the production of fish decreases. If nonylphenol is added to cancer cells it causes them to proliferate rapidly. How much of this substance is consumed by human as a result of drinking water, eating fish and cattle meat polluted with this substance? Is the reduction of fish in the Arabian Gulf waters due to over fishing or due to pollution by oestrogen like substances? This can only be answered by a core of scientist who cares about the environment and the inhabitants of the Gulf.

The ozone layer is undergoing gradual depletion. There is one ozone hole over the Antarctica and other openings over northern USA. The depletion is due to production of Chloro Fluoro Carbones (CFC) and CO. Kuwait oil fire contributed great deal to the depletion of ozone layer due to the enormous amount of CO produced<sup>4</sup>. Ozone depletion causes an increase in the ultraviolet (UV) radiation which is of two types; UV-B which inhibit the immune system locally and systematically, and UV-A which has similar effect but less potent. As a result of the increase in the UV radiation, the number of skin cancer increases and the age of skin cancer onset decreases<sup>5-7</sup>.

Noise pollution in the cities due to traffic, building construction, heavy metal rock music also contributes greatly to early sensorineural deafness in some young adults and early presbycusis in the middle age. In rural areas presbycusis is less severe and if it occurs it is mild and late in onset.

Considerable number of patients with chronic rhinosinusitis, laryngitis and pharyngitis are directly related to environmental pollution with sensitizing agents such as ozone, sulphur dioxide and lead. It is unknown how much of sinonasal neoplasia are due to inhaled air toxins<sup>8</sup>.

In some cities such as Mexico, Cairo, Tehran and Bangkok, the pollution has reached intolerable level, where it is only safe to walk with mask.

Osteofluorosis, a crippling skeletal disease in its final stage, is due to industrial exposure to fluorides. It affect workers in the aluminium reduction cell room operations, cryolite plant, phosphate fertilizer manufacture, open hearth and basic oxygen furnaces in steel plants and fluorspar miners.

Cosmic radiation is a natural phenomenon and has little effect on human but radioactive pollutants are not part of nature. Radiation hazards could cause death due to cell disruption and transmutation of atoms. It can also cause cataract, damage to reproductive system, aplastic anaemica and gene mutation.

In 26 April 1986 the Chernobyl nuclear plant in the former Soviet Union malfunctioned. The number of cases immediately died as a result of cell disruption and transmutation of atoms were 30. Radiation sickness affected 134 persons and the exposure to ionizing radiation affected five million people living in the Belarus, Russian Federation and Ukraine. Scientist attending post Chernobyl Conference organized by WHO in November 1995 have identified three main areas of concern; the large increase of psychological disorder among accident recovery workers and people living in the highly contaminated areas, the health impact of increasing thyroid cancer incidence among children and adolescent, and future cancers particularly leukemias, breast and urinary bladder malignancies and kidney diseases<sup>9</sup>. It would take many years to know how many additional cases of birth defect and skin disease will have been caused by the Chernobyl accident. I hope that these nuclear plants constructed on the Gulf coast have a better safety precaution than Chernobyl.

Disposal of radioactive nuclear waste is a major problem because some radioactive substances have a half life of 10,000 years. There is no safe method of disposal yet, that is why some rich industrial countries pay millions of Dollars to poor countries to be used as dumping ground. I hope that we are using safe method of disposal for the radio isotopes used in the medical field in Bahrain.

Land and soil pollution with pesticides<sup>10</sup> makes these compounds appear in the fruits and vegetables from that soil and it can affect the human directly by consuming it or indirectly by consuming the meat of animals which consumed these products. Pesticides have been incriminated as the cause of higher incidence of cancer and birth defect.

Air pollution is exemplified by the 1984 Bhopal pesticide factory accident in India which released enormous amount of toxic gas in the air, where within few hours caused the death of more than 2000 people.

Cities of more than 50,000 inhabitants have some degree of pollution due to:

1. Burning garbage
2. Sulphur dioxide and other noxious gases from power plant which uses oil or high sulphur coal, steel and aluminium factories.
3. Automobiles releasing sulphur dioxide, nitrogen oxides, Ozone and lead. If these gases combined with fog it is called smog which can cause death in elderly and those suffering from chronic respiratory ailments. Lead alone in the air can cause mental retardation in children and birth defects. In USA lead free gasoline is available since 1975. Unfortunately lead free gasoline is not available yet in the Arabian Gulf region for the ordinary consumer.
4. Sulphur dioxide combined with particles of water in the atmosphere form acid rain which caused in some countries death of lakes and streams and damage to the crops and trees<sup>11</sup>.

Ground water, rivers and lakes can be polluted by disposals from factories and sewage which could cause poisoning or diseases like cholera and typhoid<sup>12</sup>.

In the Arabian Gulf and in all oil producing countries, the rate of oil extraction and consumption is high. Is this safe for this generation and is it fair for the future generation? In the name of progress we should not destroy our environment and health but should seek a balance between progress and safety<sup>13</sup>.

Some of the troops who served in the operation Desert Storm in 1991 are suffering from what has been called Gulf War Syndrome which is thought to be some form of multiple chemical sensitivity (MCS) characterized by fatigue, memory problems, mood changes, skin and gastrointestinal disorders. These symptoms develop during or after exposure to environmental chemical. It is believed that pollution is the main cause of this syndrome. Shamal wind played a major role spreading particulate pollutants from petroleum oil well fires; and other organic compounds. Radiation exposure from depleted uranium in the armour and ammunition of M1A1 tanks also played a role and the carcinogenic effect of these agents cannot be assessed except after a latency period. Although exposure to biologic or chemical agents cannot be verified, the isolated use of some agents may have occurred and the damaged chemical plants may have released toxins. The abundant use of pesticides and rodenticides in the camps can cause neuropathy<sup>14</sup>.

Gulf War Syndrome has not been fully diagnosed, but most physicians believe it is some form of MCS. No similar illness has been reported from Saudi Arabia, Kuwait and Iraq, i.e. the area of operation.

People who spend most of their time indoor are supposedly not exposed to pollution because the indoor environment is believed to be clean. However in today's life there are many indoor pollutants such as smoking (passive or active) and formaldehyde emitted from furniture made of particle board, plywood and artificial carpets. Pesticides, detergents, cleaning agents and contaminated

Bukhoor can also act as sources of indoor pollution. In addition central air-condition ducts collect dust and bacteria and become a source of pollution<sup>15</sup>.

Nitrogen dioxide is a key pollutant principally produced by gas cooking appliances and children exposed to this agent face increased risk of developing upper respiratory tract infections due to lowered immunity compared with children living in a house with electric cooking appliances<sup>15</sup>.

Indoor pollutants may result in allergy or multiple chemical sensitivity syndrome or it might reduce the immunity of the individual thus predisposing to infection and other diseases.

What could be done to halt this madness of pollution and to protect ourselves?

1. Consume high fibre diet, because much of the oestrogen - like substances will be absorbed by the fibres and eliminated in the stool.
2. Avoid high fat diet because it increases the conversion of testosterone to oestrogen.
3. Decrease the consumption of dairy products, because some of the lactating cows are pregnant and therefore produce oestrogen which cannot be eliminated totally by the process of pasteurization.
4. Vitamins E and C increase sperm count and semen volume and testosterone level.
5. Protect yourself against UV radiation by the use of water proof sunscreen SPF (sun protection factor). The use of protective clothing is more effective<sup>16</sup>.
6. Government policies and laws are needed to protect the land, air and water resources.
7. People awareness of the need to protect the environment and health should be stressed by the professional and non professional societies.
8. International regulation against pollution.
9. Join Green Peace organization and encourage your children to join in order to be aware of the environment.
10. The safety of our environment should be part of the curriculum of the schools and colleges.

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