Effects of heavy metals pollution on human health

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Abstract
The presence of foreign materials in an environment, leading to cause undesirable changes called pollution, pollution can occur in water, soil, and air. Many other types of pollutions include thermal, radioactive, and noise pollutions. Chemicals like heavy metals usually most pollutants effects on plants, animals, and human health, cadmium exist by the volcano, fires in the forest, has many bad effects on human health, targeting the kidney, liver, and vascular system. Chrome, lead and manganese, cases of irritation, problems in pulmonary works, stomach, small intestine, and attacking of reproductive system. Cobalt and nickel cause chromosomal efficiency defects. Many big cities in the world suffer from high pollutions. Therefore these chemicals must be kept in safe limits, industrial cities must be under governmental laws, periodical examinations for humans and workers.

Keywords: Pollution, metals, environment


Introduction
Pollution can be defined simply mean introducing contaminants into the natural environment and causing adverse change. While pollutants are a west material that pollutes the air, water or soil, pollutants differ according to chemical nature, persistence & concentration (¹). There are many types of pollution that can be recorded including.

Air Pollution refers to any contaminating of the atmosphere leading to effects on the normal components and the air chemistry. Chemicals, dust, and excessive gases most air pollutants. Air pollution sources include manufacturing exhaust, Fires in the forest, volcano, construction of building or demolition, and others. Air pollutants cause several effects like Smog increases, higher acid rain increasing, low yields of the crop, not- enough oxygen, and results increased asthma rates. Many new theories insist on the sort relation between global warming and increasing of air pollution (²).

Water Pollutants means the presence of different types of contamination in the water, such as contamination by chemicals, or microbial organisms, leading to attack the quality and purity of water. We can notice water pollution easily in different water sources flow like rivers, lakes, and oceans. Many factors lead to occurring pollution in water like soil erosion sediment, waste, and the decay of organic material. The main effects of this type of pollution lead to decreasing in drinking water quantity, decreasing water supplies for plants, animals, and all normal living populations in water (³).

Soil Pollution that means producing of any types of pollutants to the soil that lowers or stops normal growth in soil. As a result of soil pollution poor growth, low crop productions, and finally loss of many types of normal flora and habitat. The main sources of soil pollution include danger industrial waste, sewage, pesticides (⁴).

Noise Pollution means any increase or abnormal levels of noises as a result of activity by a human. Noise pollution can occur especially in big cities because of industry, Traffics, transport like airports and so on, the effects of noise pollution may include loss of hearing, wildlife distribution, and consider more danger on lifestyle (⁵).
Radioactive contamination is very little but large in Iraq, it may because death for the human, animal, also plant when it occurs. Sources of radioactive contamination obtained from nuclear: plant, waste, and wars. Radioactive energy may cause teratogenicity, cancers, fertilization, as well as many danger for the health of humans and other organisms (6).

Thermal Pollution means increasing of heat degree. Thermal pollution may happen due to power plant activity, deforestation, and temperature moderating water sources, heat contamination may cause death (7). There are many other types of pollutions like light, Visual, Pollution, and fighting Pollution.

Pollution by Heavy Metals
Heavy metals are characterized by a high atomic number, weight, and high specific gravity (more than 5). These metals like some metalloids, transition metals, basic metals, lanthanides, and actinides. Numbers of these metals considered to be essential to life. But if H.M. presents in high concentrations, it will be toxic, because H.M. May build up in biological systems and it will be dangerous for health. The rate of heavy metals emission was low because of the high stability of most metals and /or because of low industrial activity. In past years, increasing the activity of industry by humans has substantially enhanced emissions and therefore raised concentrations of H.M. in the atmosphere. The amounts in the city will become high values (8). There are many examples of heavy metals:-

Cadmium is naturally, occurs in ores together with zinc, lead and. It does not have useful functions known in biology, however not consider an essential metal. In the atmosphere, the natural sources of cadmium from the volcano fires in the forest and transported particles of soil by wind movements. Human being exposed to cadmium simply from diet, drinking water, and air, then slowly accumulating in the human body, it has many undesirable effects on health in human, targeting the kidney, liver and vascular system in particular Cadmium compounds industrial used in plastic stabilizer, color pigment, welders, and many types of rechargeable batteries (9).

Chrome is one of the more existing elements in the world. Its chrome can be examined in different forms, less than 0.1 μg/m3 in the air to 4 g/kg in soils in concentrations as fixed by WHO in 2000. It can be used in ferrochrome production, electroplating, drying color production, tanning factories, metal plating, and alloy manufacture, metal welding and forming processes. Contamination by chromium occurred by inhaling activity in air, contaminated food, and contaminated water, then many problems obtained like many cases of irritation, ulceration, problems in pulmonary works, and lesions in stomach and small intestine, anemia, and attacking of reproductive system in man, leading to sperm count decline (10).

Cobalt found naturally in the earth's crust as [CoAsS], [Co3 (AsO4)2] and [CoAs2] compounds. It is a very important material necessary for mammals to produce many types of vitamins and enzymes. Cobalt has genotoxic and carcinogenic effects also inhibit DNA repair, alter the patterns of gene expression, inducing apoptosis, changes in the structure of chromosomes, and defects of mitotic apparatus. Cobalt also leads to lung disease, asthma and central nervous system defects (11).

Lead exists naturally in the world and is can be examined in, air, water, and soils. Contamination by lead from nature is very low, but leads important in many industries, like plastic, ceramics, paints, insecticides, and petrol, among others. The entry of lead into the human body by inhalation, ingestion and through the skin. It can distribute in the body by blood, soft tissues, and bone and causes damage, especially in the kidney. Lead has carcinogenesis and mutagenesis effects on human lesions gastrointestinal tract, immune system, endocrine, and reproductive system (12).

Manganese for humans, animals, and plants, very necessary nutrition, and it is needed for growth, development it can be recognized in many oxidation forms and it highly exists in the earth's crust it can be examined in soil, water and food. In industry, it is the most used metals, in the production of many chemicals. A variety of diseases especially in the nervous system, and ‘manganism’ (13).

Nickel is found in very low amounts as metal, recognized in the 18 century, it found in some vegetables like spinach. Natural sources of atmospheric nickel from dust, volcanic emissions and the weathering of soils. Natural sources of aqueous nickel derive from biological cycles and compounds form soils. In industry, it is used in catalytic converters for automobiles, electroplating,
electroforming, cast coins, produces jewelers, medical prostheses, and production of nickel-cadmium batteries.

**Heavy metals and human health**

According to the WHO World Health Organization in 2000 also, there is no safe level for nickel compound can be recommended. Increased risk of the respiratory tract and nasal cancers in miners and workers in nickel refineries, increasing nickel concentration in humans may lead to cardiovascular disease kidney defects. Many research discussed pollution problem in Iraq. It is documented that some heavy metals have many effects on environment. They have wide effects on human health. Heavy metals considered as complex environmental pollutants, their levels increased highly in air, water, and soil as a result of industrial and agricultural activity. Causing many disorders, including cancer, cardiac disorders, bronchitis, asthma, pneumonia, emphysema, and many other diseases.

To prevent the effects of the heavy metals of health, safe limits must be determined for different substances. These agreed limits, when the case of the high presence of different pollutants. It will lead to undesirable reactions between pollutant materials and living organism’s life, in case any accumulation or increase in toxicity must not pass these safe limits. It was reported that, most human health problems in Iraq associated with heavy metal toxicity like cancer, anemia, damage in kidney and liver, respiratory system, and breast milk.

**References**