

Heavy Metals Effect of Human Health

Abstract

Several hazardous of heavy metals depicting different physiological and biochemical problems have been already reported. Various heavy metals such as cadmium, chromium, lead, mercury and silver etc. Heavy metals causing adverse effects are the most health effect and regulatory limits to human. It is very necessary to control and reduce this would become health in harmless environment by which our human society would be benefited much with their safe and good health.

Keywords: Human Health Metal, Toxicity, Effect.

Introduction

Heavy metal is individual metals and metal compounds that can impact human health. Five common heavy metals are discussed in this brief; cadmium, chromium, lead, mercury and silver. These are all naturally occurring substances which are often present in the environment at low levels. In larger amounts they can be dangerous. In our everyday life all the creatures of the environment are continuously expose to various metal pollution from several sources.

Generally human are exposed to these metals by ingestion (drinking or eating) or inhalation (breathing). Working in or living near an industrial site which utilizes these metals and their compounds increase ones risk of exposure as dose living near a site where these metals have been improperly disposed. Subsistence lifestyles can also impose higher risk of exposure and health impacts because of hunting and gathering activities.

Cadmium

Cadmium is a very toxic metal. Cadmium is naturally present in the environment; in air, soils, and sediments and even in unpolluted sea water. Cadmium has many uses. Including batteries, pigment, metal coatings and plastics. It is extensively in electroplating.

Health effect

Cadmium compound are known human carcinogens. Smokers get exposed to significantly higher cadmium levels than non-smokers. Severe damage to the lungs may occur through breathing high levels of cadmium.

1. Long-term exposure to lower level lead to a buildup in the kidney and possible kidney disease, Lung damage, and fragile bones.
2. Ingesting very high levels severely irritates the stomach. leading to vomiting and diarrhea.

Regulatory limits

EPA-5 parts per billion (ppb) or 0.005 parts per million (ppm) of cadmium in drinking water.

Food and Drug Administration (FDA)-concentration in bottled drinking water should not exceed 0.005 ppm (5ppm)

OSHA-an average of 5 micrograms per cubic meter of workplace air for 8-hour workday, 40-hour work week.

Chromium

Chromium is found in rocks animals, plants and soil and can be liquid, soil or gas. Chromium compound bind to soil and are not likely to migrate to ground water but. They are very persistent in sediments in water. Chromium is used in metal alloys such as stainless steel; protective coatings on metals (electroplating) magnetic tapes; and pigments for paints, cement, paper, rubber composition floor covering and other materials. Its soluble forms are used in wood preservatives.

Health effects

Chromium compound are toxins and known human carcinogens. Whereas chromium as in essential nutrient.

Breathing high levels can cause irritation to lining of the nose: nose ulcers: runny: and breathing problems such as asthma, cough. Shortness of breath or wheezing, Skin contact can cause ulcers. Allergic reactions consisting of severe redness and swelling of the skin have been noted.



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Long term exposure can cause damage to liver. Kidney circulatory and nerve tissues, as well as skin irritation.

Regulatory limits**EPA**

0.1 ppm (parts per million) in drinking water.

FDA

Should not exceed 1 milligram per liter (1 ppm in bottled water)

OSHA

An average of between 0.0005 and 1.0 milligram per cubic of workweek, Depending on the compound.

Lead

As result of human activities. Such as fossil fuel burning, mining and manufacturing. Lead and lead compound can be found in all parts of our environment. This includes air. Soil, and water. Lead is used in many different ways. It is used to produce batteries. Ammunition, metal products like solder and pipes. Lead is a toxicologically relevant has been brought into the environment by man in extreme amount. It use in several product like gasoline, paint and pipe solder. Today the most common sources, contaminated soil, household dust. Drinking water, lead crystal lead in certain cosmetics and toy and lead-glazed pottery.

Health effect

EPA has determined that lead is a probable human carcinogen. Lead can affect every organ and system in the body. Long term exposure of adult can result in decreased of performance in some tests that measures functions of the previous system; weakness in fingers. wrist, or ankles; small increases in blood pressure; and anemia.

Exposure to high lead levels can severely damage the brain and kidney and ultimately cause death.

High level exposure in men can damage the organs responsible for sperm production.

Regulatory Limits

EPA-15 parts per billion (ppb) in drinking water. 0.15 micrograms per cubic in air.

Mercury

Mercury is one of the most toxic heavy metals in the environment. Mercury is use to produce chlorine gas and caustic soda and is also used in thermometers, light and batteries. Mercury in soil and water is converted by microorganism to methyl mercury a bioaccumulation toxin.

Health effect

The EPH has determined that mercuric chloride and methyl mercury are possible human carcinogens.

The nervous system is very sensitive to all forms of mercury. short exposure to high levels of metallic mercury vapors may cause lung damage, nausea, vomiting, diarrhea, increase s in blood pressure or heart rate, skin rashes, and eye irritation.

Regulatory Limits

EPH-2 parts per billion (ppb) in drinking water

Silver

Silver usually combines with other element such as sulfide, chloride and nitrate. Silver is used to

make jewelry, silver ware electronic equipment and dental fillings. Silver metal is also used in conductor. Silver compound are used in photographic film.

Health effect

According to EPA, silver is not classifiable as a human carcinogen.

Exposure to high levels of silver in the air has resulted in breathing problems. Lungs and throat irritation and stomach pains.

Skin contact with silver can cause mild allergic reactions such as rash.

Regulatory limits**EPA**

Recommend concentration in drinking water not to exceed 0.10 parts per billion (ppb).

OSHA

In workplace air 0.01 milligrams per cubic meter (0.01) for an 8-hour workday 40-hour workweek.

Units of Measurement

1ppm=1 part per million =1 milligram/liter (mg/l)

1ppm=1part per billion =0.001 ppm= 1 microgram/liter($\mu\text{g/l}$)

Conclusion

Conclusively, based on experimental studies, the advances of toxicology has improved our knowledge about human to toxic(metals) and their health effects, such as development retardation, several type of cancer, kidney damage, endocrine disruption, neurological effect and other disorders. The ongoing research work throw more light into new inside and biological and molecular mechanism involved in the development of pathological condition in human.

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