



A SHORT COMMUNICATION ON IMPACT OF METALS ON WOMEN'S HEALTH

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Article Received on 28/08/2018

Article Revised on 18/09/2018

Article Accepted on 08/10/2018

INTRODUCTION

Heavy metals describe as any metallic chemical element that has a high density and is poisonous at lower concentration. Heavy metals include arsenic, lead, copper and mercury which mainly effects reproductive system and especially poisonous to growing fetus.^[1] These heavy metals are not filtered by placenta from mother to child and are straight deposit in growing fetal tissue. Women under the influence of toxic metals may be infertile, wildly irregular hormone level. Their unborn children receive heavy metals from their pregnant mother. This review paper provides an overview of the current knowledge of toxic effect of metal during pregnancy and to newly born baby. The main objective is to encourage detoxifying mother before conception.

These are metals ranked among the top ten most toxic substances by the Agency for Toxic Substances and Disease Registry.^[2] Maternal exposures to toxic metals may result from diet, air, drinking water, occupational exposures, and/or tobacco use. Evidence suggests that each of these metals is able to cross the placental barrier resulting in prenatal exposure^[3,4,5,6] and maternal blood levels of these contaminants correlate with umbilical cord blood levels.^[5,6] Biologically, prenatal exposure to metals is of concern for a variety of reasons. For example, prenatal exposure to arsenic is associated with water life health effects in adults^[7,8,9] including increased mortality and increased risk of lung and liver cancer.^[10,11,12] In addition, in utero exposure to arsenic has been shown to alter genomic signaling of key biological pathways.^[13] Furthermore, maternal exposures to toxic metals can increase the risk for poor birth outcomes, including low birth weight reduced fetal growth, and reproductive and cognitive deficits in adolescents.

Mercury: Human activities, particularly mining and coal burning, have contributed to the mobilization of Hg and raised its levels in air, soils, fresh and marine waters. Mercury is a metal. If you come in contact with high levels of mercury during pregnancy it can cause real problems for you and your baby. Mercury can damage many parts of your body including your lungs, kidneys and nervous system. It also can cause hearing and vision problems. How serious the damage is depends on how much mercury you are exposed to. Babies exposed to mercury in the womb can have brain damage and hearing and vision problems.^[18,19,20,21]

Lead: Lead is a heavy metal that is found in the environment and may be ingested in food prepared with water transported through lead pipes or from processing plants using equipment or painted walls that contain trace amounts of the lead. The soluble compounds of lead is poisonous. lead may access into body through inhalation, by ingestion or by absorption through skin and mucous membrane. When women encountered to lead during pregnancy can cause a miscarriage, premature birth Low birth weight and it effects development of fatuous brain and growth of new born baby also retarded. Lead poses health risks for everyone, but young children and unborn baby more porn to lead toxicity which contributes to effect development of growing children and their behavior and learning.^[16,17]

Arsenic: Arsenic is a metal which is not poisonous. It is insoluble in water so it is not absorbed from alimentary canal. However, it may change into arsenious oxide. Arsenic may be harmful during pregnancy. Due to use of fertilizers in agricultural areas by farmer, it may contain toxic material. If we take it in diet it may be more harmful. Arsenic in the diet may also come from well water in areas near mines or electronic manufacturers that use the heavy metal for their products.

Women who live near or in agricultural areas where arsenic fertilizers were used on crops or who live near hazardous waste sites, also may be exposed to terrific condition due to arsenic. Arsenic affects the pregnant women having gestational diabetes. Chronic arsenic exposure from drinking water may increase the risk of fetal and infant death. Pregnant women who are exposed

to arsenic risk of mental retardation and developmental disability in new born baby.

Copper: Copper in metallic form is not poisonous but some of its salts are poisonous such as blue vitriol and sub acetate. Copper is a powerful inhibitor of enzyme. Sources of copper are common in the diet, particularly in vegetarian diets, and can be found in the water due to copper plumbing. Many multiple vitamins contain relatively high doses of copper. The hormone estrogen promotes the retention of copper and this is why women are particularly vulnerable to the problem of copper toxicity. Copper toxicity may leads to poor fertility rate.^[14,15]

Cadmium: Scientists suspect that cadmium may pose a risk in pregnancy. One study suggests that cadmium may damage the placenta and reduce weight of new born baby. This metal is used in many occupations, including semiconductor manufacturing, welding, soldering, ceramics and painting. Women who work with cadmium should take all recommended precautions and avoid bringing it home on clothing. Pregnant women also may want to consider eliminating sources of cadmium from the house, such as fungicides containing cadmium chloride, certain fabric dyes and ceramic and glass glazes and some fertilizers. Cadmium at lower concentration

may produces adverse effect during delivery it causes abortion and weight of new born child will retarded.^[18]

Cigarettes smoking as the source of heavy metals and its implications in reproduction.

Lead

It was demonstrated that smoking can be a important source of heavy metals especially Cd and Pb. This is due to the tendency of tobacco plants to accumulate metals available in soils and translocation from the roots to the above-ground parts, including leaves which are harvested for cigarettes production. Tobacco smoking is prevalent among males but is also widespread among women. Globally, 1 billion men and 250 million women smoke every day. In 2011, over 30% of Poles smoked cigarettes regularly. It was estimated that 100,000 children in Poland are born annually by mothers who smoked during pregnancy. It is forecasted that between 2000 – 2025, the number of cigarette-smoking women will increase by 8%. There is evidence that cigarette smoking leads to an overload of human body with heavy metals. Significant number of studies demonstrated that among smokers elevated levels of Cd and Pb in blood are usually found; some even indicated a considerable correlation between metal concentration and number of cigarettes smoked daily. Increased levels of Cd and Pb are also being found in endometrium of cigarrete smoking female.^[22,23,24,25,26]

Reproductive System	
<i>TOXIC HEAVY METALS</i>	<i>SPECIFIC EFFECTS</i>
Aluminum, Thallium	Genital abnormalities
Copper, Mercury	Disturbances in menstrual cycle, menstrual pains
Arsenic, Lead, Mercury	Birth defects, premature births, Spontaneous abortion
Arsenic, Lead, Aluminum, Cadmium	Reproductive dysfunction

Effects of metallic poisons on new born baby

- Arsenic:** Effects muscular growth, low birth weight, mental growth retarded, low IQ level of new born baby.
- Lead:** Adverse effect on neurodevelopment, brain growth is retarded, increases risk of miscarriage and increases changes of premature birth, effects IQ level of growing children, It decreases fetal growth.
- Copper:** Increases chances of miscarriage, complication during delivery, low birth weight, muscular weakness in new born baby, it leads neurological problems in growing children.
- Mercury:** Effects mental growth of new born baby, adverse effect on nervous system, effects cognitive thinking. Cadmium: Effect growth of new born baby, low IQ level, creates cardiac abnormalities, It produces craniofacial abnormalities such as eyes of new born baby is small, nasal bridge is poorly formed, leads to renal abnormalities.

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