

## **Adverse Effect of Carcinogenic Metals in Tobacco on Human Health**

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Tobacco is a rich source of toxic heavy metals gets preferentially enriched in the tobacco leaves during plant growth. These metals are required in body in trace quantities. Any change in the trace metal contents in the living system by any means will lead to serious toxicity either by replacing the essential trace metal in the body.

From the Tobacco leaves alone, a lot of metals end up in the tobacco, but once this product is manufactured even more metals are added from the chemicals used during the production process. Therefore tobacco is exposed to a wide range of diseases caused by a high level toxic metals found in this chewable product. About four thousand chemicals (organic as well as inorganic) are identified in tobacco and classified in different groups according to their health hazards index by International Agency for Research on Cancer (IARC).

Heavy metals constituting the inorganic constituents of tobacco proved to be highly toxic even at low levels to its users as they get easily incorporated into user's body. Certain metals like cadmium, lead, chromium, nickel etc. are declared as human carcinogens by IARC.

Chewing tobacco. A survey has reported that about of 3500 individuals in 7% of the villagers used this product. Like chewing tobacco it is considered responsible for oral cancer and other severe negative health effects.

The different constituents of kappoori like tobacco, finally cut areca nut, camphor, Peppermint, cardamom, clove and slaked lime. Alkaloids present in areca are known to give rise to carcinogenic nitrosamines and the World Health organization (WHO) has recently evaluated areca nut as a human carcinogen. The use of areca nut by itself appears to be mildly addictive but when used with tobacco, the effect multiplies manifold.

The toxicity of Cd results in kidney diseases, skeleton damage and pulmonary diseases. Cd is also causes carcinogenic diseases, lung damage and high blood pressure. Cadmium is not the metal that can affect pregnancy. Actually, leads another metal that can affect the developing fetus.

The maternal blood is correlated to the fetus blood via the umbilical cord and can easily expose the fetus to dangerous concentration of lead [Pb]. Lead is of crucial concern to neurotoxin and can affect their brain and central nervous system, which can lead to mental retardation and other neurological disorders.

Copper is essential element in human metabolism but copper in smokeless tobacco may be responsible for the fibrosis in mouth cavities. Early symptoms of chronic copper poisoning including pre cancerous oral lesions (leucoplakia-small white patches) and sores in mouth or tongue followed by oral sub mucous fibrosis and difficulty in opening the mouth fully. Abnormal accumulation of copper in the tissues and blood causes Wilson Disease. Most of the absorbed copper is stored in the liver and bone marrow. Acute exposure to copper causes vomiting bloody diarrhea, hypertension and cardiovascular collapse.

Another metal of interest from tobacco is nickel. The health effects are highly dependent on the manner and degree of exposure and on the exact chemical species in which the nickel atoms are present. The allergic effects tend to arise from the nickel cation, but it is not entirely clear which chemical species is responsible for the carcinogenic effects noted much more commonly in the past. Small amount of nickel is needed by the body to produce red blood cell. However, exist amount can become toxic long form exposure to nickel causes decrease body weight, skin irritation, heart and liver damage. In this study the concentration of nickel in Mainpuri tobacco found to higher (1.200µg/g- 1.698µg/g)

Chromium is present in two chemical states. Chromium (III) is an essential trace micronutrient required for carbohydrate, protein and fat metabolism. The other chromium (VI) is very toxic found in tobacco and is known to cause lung cancer. Adverse effect of the hexavalent form on the skin may include ulcerations, dermatitis and allergic skin reaction and perforation of the mucous membranes of the nasal septum, irritation of the pharynx and larynx, asthmatic bronchitis bronchospasms and edema. Respiratory symptoms may include coughing and wheezing shortness of breath and nasal itch. Tobacco kills approximately 6 million people and causes more than half a trillion dollars of economic damage each year.

WHO gave these report in the Global Tobacco Epidemic in 2013 and enforcing bans on tobacco

advertising, promotion and sponsorship.

So it is necessary to measure the level of different toxic components in tobacco product to better understand their potential health risks and to assess the risks for cancer and other disease related to current tobacco product.

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