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INFLUENCE OF NICKEL INDUSTRY ON ETIOLOGY OF GASTRIC CANCER

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Gastric cancer is one of the most common and dangerous malignant tumors. It has impressive speed of tumor development and metastasis. Generally, stomach cancer is the fifth leading cause of cancer and the third leading cause of death from cancer diseases making up to 7% of cases and 9% of lethal outcomes. In 2012 950,000 people were made such diagnosis with subsequent 723,000 deaths. This disease may be caused by many factors: infection, smokes, dieting, genetics. But there is one reason which was interesting for us more than others. It is work with harmful materials. As an example we want to show mechanism and statistics of influence of work at factories which deal with nickel. Nickel is the basis of most super alloy heat-resistant materials used in the aerospace industry for power plants components. It is used for chemical and radiation technologies, production of batteries, medicine, music industry and in the coin industry.

Human organism is very sensitive to contact with heavy metals. And nickel is one of the most dangerous ones. In history we can see that even some cashiers had allergic reactions due to the contact with nickel coins. Even injection needles may be the cause of allergy. Nickel which is breathed in or introduced through the digestive tract is evenly and fast deposited in the lungs and digestive tract tissues. After that salts and the highly dispersed metal absorb from digestive tract to blood and develop a specific complex with plasma proteins called nickeloplasmin. It inhibits aminopyridine demethylase, citochrom-450, tryptophan pyrrolase, benziopiren hydrolase. Nickel decreases synthesis of RNA which may be caused by the suppression of RNA polymerase in the nucleus. Influence of this metal on ferments induction is caused by its carcinogenic effect. From human organism nickel eliminates through the digestive tract and kidneys. The problem is that nickel particles may accumulate in gastric tissues and cause changes in cells, dystrophy and eventually atypia (malignancy).

Stomach cancer is the second in the statistics of diseases of people who work with nickel. The following people were mostly exposed to gastric cancer: who had work experience of 10-14 years; who worked with pyrometallurgical process in roasting and recreation manufactures, where the concentration of nickel dust was about 10-10² mg/m. This dust contains 70% of sulfides NiO or Ni. Also the aerosols of NiCl₂ and NiSO4 are very dangerous.

Normal concentration of nickel in blood is 0,5 mg/m³. People, who work at the manufactures which deal with nickel, have 1 mg/m³, that is its double value. Lethal concentration of nickel in the air is 0,021-0,028 mg/l.

Symptoms of nickel poisoning: weakness, headache, dizziness, dyspnea, coughing, cyanosis, dermatitis. There also may be convulsions, delirium. For prophylactics the manufactures which deal with nickel should strictly control the level of metal particles in the air, protect their workers by providing them with respiratory masks, protective clothing, equipment and regular medical examinations.

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