**Chronic exposure to nickel in metal industry**

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**Objectives:** Industrial sources of nickel include metallurgical processes such as electroplating, alloy production and stainless steel (CAMERON et al. 2011). Chronic professional poisoning can occur after long-term exposure to nickel by inhalation or ingestion, which makes it necessary to study its toxic effects. The most important route of human exposure to nickel is inhalation. This exposure has long been known to cause acute respiratory symptoms, ranging from mild irritation and inflammation of respiratory system to bronchitis, pulmonary fibrosis, asthma and pulmonary edema (SALNIKOW & ZHITKOVICH, 2008). The inhalation of nickel-containing dust has been associated with an increased risk of respiratory cancer in workplaces that process and refine sulfidic nickel mattes, where workers are exposed to mixtures of sulfidic, oxidic, water-soluble, and metallic forms of nickel (GOODMAN et al. 2011; MUÑOZ & COSTA, 2012). The most common reaction is nickel allergy in the form of contact dermatitis as well (CANDURA et al. 2001). Although the accumulation of nickel in the body through chronic exposure can lead to lung fibrosis, cardiovascular and kidney diseases, the most serious concerns relate to nickel’s carcinogenic activity. Also, mechanistic theory suggest that the apparent absence of risk in workers with low nickel exposures is due to threshold-like responses in lung tumor incidence (oxidic nickel), tumor promotion (soluble nickel), and genetic damage (sulfidic nickel) (SEILKOP & OLLER, 2003). Given that the exposure to high levels of nickel in biological materials is an important indicator of the toxicological risk, we performed the statistical analysis of the association of age and length of service and nickel concentrations.

**Materials and methods:** The applied analytical method type is that of retrospective epidemiological cohort study covering the period of ten years. We used data from the annual reports of social medical services and statistics, data from medical records of both primary and specific occupational health care as well as records of the Institute for Workers Health Care and the Public Health Institute in Nis. Using atomic absorption spectrometry, we conducted the analysis of the concentration of nickel in biological material. Statistical analysis and presentation of the results was performed using software packages Excel, Matlab, SPSS19.0.

**Results:** The level of nickel in blood and urine of exposed groups during the study period was positively correlated with age (r=0,770, p<0,01 i r=0,713, p<0,01). We also determinedthe high positive correlation between the concentration of nickel in blood and urine and the exposed length of service in exposed subjects during the time of study, (r=0,840, p<0,01 i r=0,805, p<0,01, respectively).

**Conclusion:** These data confirm the association between occupational exposure to nickel as well as the age and length of service exposed and point to a response to the consequences of harmful effects. A retrospective cohort epidemiological study showed that the systematic effects of nickel exposure result in an increase of its concentration in biological material, thus confirming the hypothesis of high toxicological risk.

**Key words:** nickel,chronic exposure, toxicological risk.

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