Biomonitoring of metals in serum samples

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Abstract

Metals are probably some of the oldest toxicants known to humans and commonly found in the environment. Their presence could be due to natural occurance or ad a result of anthropogenic activities. The actual exposures may be reflected in biological media such as blood and urine and in some cases biomarkers have been developed for the study of these chemicals in biologic systems.
Biomonitoring of trace elements in human blood samples has become an important tool for occupational and environmental health.

Aim

The aim is to follow the concentration of some metals (Mn, Cr, Zn, Cu, Pb, Ni, Co) in human serum. To use ICP-AES technique for biomonitorin and risk assessment of health of professionally exposed population.

Materials and methods

The samples of serum were taken from a group of 30 professionaly exposed workers – miners. Serum samples of the control grupou were taken from citizens of municipality not directly exposed to these metals. The ICP – AES technique was used for analyzing the samples.

Results

Obtained metal concentrations in mg/L are as follows: exposed gropu: 0,278 (Mn); 0,06 (Cr); 1,343 (Zn); 1,342 (Cu); 0,087 (Pb); 0,057 (Ni); and 0,03 (Co); Nonexposed group: 0,228 (Mn); 0,004 (Cr); 0,681 (Zn); 0,762 (Cu); 0,005 (Pb); 0,027 (Ni); and 0,012 (Co). High levels of investigated metals in serum (compared with MAC for these metals and with control group) at the mine workers from lead zinc mine, which corresponds to their professional exposition. The levels of metals obtained from serum in control group (nonexposed population) are lower compared to previous group, which correspond to their limited exposition on these metals. The results correspond to expectations, according to professional exposition of mine workers. Metal concentration in serum can be used for biomonitoring of human heavy metal exposition