Assessment Problems of the Health Risk for Employees, Who Works With Nanomaterials

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Nanomaterials and nanotechnology are widespread around the world. The technologies are developed that gives a nano-objects and nanosystems with desired properties, they are used in microelectronics, energy, chemical and food industries, cosmetology and agriculture [1]. Nanomaterials have opened new possibilities in medicine and pharmacology.

Nowadays the issue of risk assessment in the field of nanotechnology is actively discussed, including occupational hazards in the production and use of nanoparticles. Farther, it is marked on the impossibility of the traditional approaches via physical and chemical properties of nanoparticles, especially via their biological action, insufficiency of full information about indicators of acute and chronic toxicity in vitro and in vivo experiments, the lack of information about the impact on the workplace, which were are use nanotechnology [1].

For nano-specific risk assessment studies on the toxicity of nanoparticles of various elements have paramount importance, especially in view of the constant increase of the number of employees who have professional contact with nanomaterials. The nanoparticles can penetrate unchanged across the cell barriers, as well as across the blood-brain barrier into the central nervous system. They can circulate and accumulate in the organs and the tissues, and cause more pronounced pathomorphological changes in the internal organs, and have a long half-life. Risk assessment is difficult because the current approaches do not take into account the physical and chemical properties of nanoparticles and the peculiarities of their biological effect. The size, shape and density of the nanoparticles must be considered when the maximum permissible concentrations are calculated. It should be noted that risk assessment and control it, which requires a much larger base of experimental data than is currently accumulated on this issue.

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1. О.В. Демецька. Підходи до оцінки ризику впливу наночастинок та наноматеріалів на робочому місці // Український журнал з проблем медицини праці. – 2011. – Т2, №26 – С. 62–67.