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Impact on health by nanoparticles created by high temperature explosions

Combustion processes create a form of particulate pollution that can be released into the environment. The size of the particles mostly depends on the temperature the process has happened, while their chemistry depends on the materials present at combustion. The higher the temperature, the smaller those particles are. As a consequence of the explosion of Depleted Uranium bombs, the temperature in a certain neighbourhood exceeds 3,000 °C, as described back in 1978 by the researchers working at the US Army Base of Eglin (Florida) who discovered the presence of inorganic micro- and nano-particles polluting the environment after explosion tests had been carried out. Without being able to supply any scientific demonstration, they advanced the hypothesis that that kind of pollution could be dangerous to humans if inhaled or ingested. Aim of this work has been to verify that hypothesis through the detection of that micro- and nano-sized particulate matter in sick people who took part in the latest war in former Yugoslavian territories and contracted the so-called Balkan Syndrome. Twenty cases of Italian soldiers and 8 cases of civilians living in Sarajevo at the time when the war was fought were examined. Those patients suffered from Hodgkin's and non-Hodgkin's lymphomas or different forms of cancer. Through an innovative technique of Environmental Scanning Electron Microscopy (ESEM), particles were actually consistently detected in all those patients' pathological tissues and, in a few cases, also in their sperm. An elemental analysis of the particles was carried out through a method of Energy Dispersion Spectroscopy (EDS). Those analyses showed that those micro and nano foreign bodies were of inorganic nature, mainly metallic, and were not biodegradable. In some instances, very unusual alloys were detected. The evidence of particulate matter in human tissues able of triggering the onset of what until now are classified as "cryptogenic" diseases lead to set the foundations of a new discipline called "Nanopathology".

back to index