Non-Ionizing Radiation & Children's Health

International Joint Workshop
18 - 20 May 2011, Ljubljana, Slovenia

PLATFORM PRESENTATION ☒

Radiofrequencies experimental studies, mechanisms of interaction

Carmela Marino

Unit of Radiation Biology and Human Health, ENEA, Casaccia Research Centre, Rome, Italy

Since the exposure to radiofrequences sources (as mobile phone) is frequent and repeated during the human lifetime, experiments dealing with acute and chronic exposure are recommended. In this context the animal studies are used because the experimental conditions can be rigorously controlled. Hence, animal experiments are valuable in the analysis of the biological effects and mechanisms, as they involve a complete organism, including all relevant in vivo reactions, at least for the animal, and can clarify whether a causal relationship exists. With particular regard to the studies on the biological effects of exposure to electromagnetic fields on pregnant and newborn animals are considered one of the highest priority in the EMF health risk assessment.
Children are assumed more sensitive, and with a large possibility of change in sensitivity with age, drugs, and other agents.
The number of studies specifically devoted to investigate the effects of Radiofrequency (RF) radiation on children is very limited. With respect to adults, different interactions and responses can be hypothesized, that could render children more vulnerable due to the greater absorption in the tissues of the head, and a longer lifetime of exposure. Moreover, according to the suggestion of the Stewart Committee report , the main risk for children could be related to the development and maturation of the central nervous system, immune system and other critical organs; in this context, about 20 peer reviewed research papers on in vitro studies have been published and several cell types, from humans or rodents, have been investigated. They include primary cells, embryonic cell lines, undifferentiated cancer cell lines, stem cells and the main results will be presented and discussed.
Concerns about the exposure to EMFs during prenatal life have also been raised because developing tissues and organs are more susceptible to noxious agents than those of adults. Numerous studies have shown that exposure to very intense EMFs may have teratogenic effects due to a prolonged increase in body temperature, while studies investigating teratology end points showed no deleterious effects from exposure to low (non-thermal)-level EMFs. Few papers have been published on immature animals with results related to immune system, nervous system, hormonal status, innate and learned behaviour, cancer and related processes. Fertility and reproductive capacity are also evaluated at parenteral level as well as in the newborn.