

National Activities on Non-Ionizing Radiation

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Research activities

Department of Human Genetics, Guru Nanak Dev University, Amritsar has conducted number of studies in this area. In one of the study a correlation between mobile phone use (exposure to radio frequency radiations) and DNA and chromosomal damage in lymphocytes of individuals using mobile phones was observed which may have long-term consequences in terms of neoplasia and/or age-related changes (Gandhi & Anita, 2007). Another study reported (Gandhi & Singh, 2005) cytogenetic damage in tissues of some individuals using cell phones over a period of time. The data revealed increased number of micro nucleated buccal cells and cytological abnormalities in cultured lymphocytes indicating the genotoxic response from mobile phone use. As exposure to radiofrequency radiations has been reported to affect physiological, neurological, cognitive and behavioral changes and to induce, initiate and promote carcinogenesis; threat to human health has been suggested for mobile phone users (Gandhi et al. 2005).

Indian Council of Medical Research (ICMR) supported an animal study entitled “Microwave radiations effects on reproductive systems of male rats” which was carried out at School of Environmental Sciences, Jawaharlal Nehru University, and New Delhi. The result obtained showed that the chronic exposure to Radio Frequency Radiation (RFR) imitated from cell phone causes a significant decrease in protein kinase C and total sperm count along with increase apoptosis in male rat. The study suggested that decrease in sperm count and increase in apoptosis may be a causative factor due to mobile radiation exposure leading to infertility (Kesari et al 2010).

In another study a significant increase in peak heart rate, serum total cholesterol, VLDL cholesterol and triglycerides concentration were noticed in acute RFR exposed male students in comparison to control students (Parkar et. al., 2010).

PGIMER, Chandigarh, has conducted a study (Panda et al., 2010) and reported long term and intensive mobile phone use may cause inner ear damage and based on their

observations they have recommended following criteria's for the release of harmful rays from mobile phones.

- Mobile phones should not be used continuously for more than one hour in a day.
- Hands free technology to be used where excessive use of the mobile phone is unavoidable. This includes use of microphones and Bluetooth so that the handset remains away from the ear and thus avoids the direct impact of harmful electromagnetic radiations on the ear and the brain.
- People to avoid long talks and discussions on mobile phones as far as possible.

Evidence have been provided by an animal study indicating that continuous exposure to low intensity microwave radiation may have an adverse effect on the brain function by altering circadian system and rate of DNA damage (Chaturvedi et al., 2011).

To study the adverse effects of RFR emitted from cell phone, the ICMR has just initiated a cohort prospective study in Delhi & National Capital Region (NCR) to examine whether use of cell phone is associated with neurological disorders (cognitive behavior, sleep related disorders, depression etc.), reproductive dysfunctions and promote cancer in Indian population. The efforts are also ongoing to study the effect of RFR on cardiovascular disorders and otological disorders, if any. Under this study the provision has been made to measure specific absorption rate, power density, wave length and frequency of RFR emitted from various types of cell phones used by the enrolled subjects. The physical characteristics of RFR emitted from various cell phones will be correlated with the clinical & laboratory findings.

Policies and legislation

For Department of Telecommunication to comment

Area of public concern

There has been unprecedented growth in the communication industry in India in recent years which has resulted in a dramatic increase in number of cell phone towers (5.4 Lakhs) and more and more towers are being erected each year. The cost of mobile phone technology have fallen which has lead to increased number of subscribers in the Country (725 million). There have been growing public concern of possible adverse health effect due to RFR radiation. The area of concern is the radiation emitted by the fixed infrastructure in the mobile telephony such as base stations and their antennas, which provides the link to and from mobile phone. Following the enormous increase in

the use of cell phone in the Country the health concerns are being raised from time to time both in print and electronic media. This public concern has also been raised in the Parliament of the Country and the Govt. of India has therefore, directed the concerned Departments to conduct studies to find out whether there is any effect of Radio Frequency Radiation emitted from cell phone and cell phone towers on the health of the Indian people.

New public information activities

Efforts are going on to educate the people regarding the possible health effects of RFR emitted from cell phone and cell phone towers by conducting seminars, public debates and discussions at various platforms. Both electronic and print media are also being used to educate the people in this regard.

References

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