

Radiation impact from Cell Phones and Towers on Human Health and Environment - A Review

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ABSTRACT

The main key points discussed in the research paper are radiation impact from cell phones and towers electromagnetic waves on human health such as head and brain tumors, other morbidity-related outcomes and summarizes the biological effects of radio frequency (RF) and microwave radiation. The report shows that the evidence available does not provide a clear pattern to support an association between exposure to RF and microwave radiation from mobile phones and direct effects on health. It however cautions that lack of available evidence of detrimental effects on health should not be interpreted as evidence of absence of such effects and recommends a precautionary approach to the use of this communication technology until more scientific evidence becomes available. ; "These days we have Smartphones, Smartcards, Smartboards, Smart everything, but consider this: if technology is getting smarter, does that mean humans are getting dumber (ignore)?"

Keywords : Electromagnetic waves, cellular phone, radio frequency, microwaves, radiation effect, wireless router.

I. INTRODUCTION

The last two decades witnessed a magical revolution in the field of telecommunication as well as in data communication. The number of cell phones and cell towers are drastically increasing all over the world. The developments in cell phone technology have made our life much more comfortable. Cell phone communicates in the range of radio frequency, which is a low frequency non-ionising radiation. A mobile phone base station is designed in such a way that the

cell phones coming under its coverage area should be able to transmit and receive enough signal which enables proper communication within a few kilometers. In order to establish more coverage, most of the towers are mounted near populated areas. People living nearer to the towers receive much more signal level than required for most of the times. In India, lacks of people live in the high radiation zones. But most of the people are not concerned about the effects of radiations on health and possible safety measures to overcome the hazards. This demands the

need for continuous studies on the effects of radiation on public health. The aim of the paper is to study the effects of RF radiation from cell towers on the health of nearby inhabitants. A world-wide popularization of smartphones and a little knowledge about their side effects triggered the author to start research on effects of smartphones on human health and life. Extensive usage of smartphones has an effect on human's upper extremities, back, and neck. Studies in this area show a significant association between the total times spent using mobile device each day and pain in the right shoulder and between times spent internet browsing and pain at the base of the right thumb. This research was supported by a survey to identify the side-effect of using smartphones and hand-held devices among users between age group 15 to 64.

1.0 Impact of mobile phone on human health:

Presently, cellular phones are being used everywhere because these devices do not use the physical cable or wire that is demanded for the communications purposes. Their demand for the electromagnetic radiation for receiving and transferring the data in the air; either it is a network or a sound data. These mobile phone devices give off harmful radiations which effects to the human health because such type of radiations are available everywhere and their existence cannot be felt. These radiations also penetrate our body and they affect the cell structure and the DNA. The different types of radiations are being used for connecting the mobile phone devices with each other and each type of radiation having own frequency and wavelength, the frequency mostly ranges from 3 KHz to 300 GHz. There are several cases of mobile phone devices such as cellphones, wireless router, tablet PC, cell telephone tower, wireless hand free, Bluetooth device, audio player, laptop connected to the wireless router (Wi-Fi). These devices give off harmful radiations which can contribute too many harmful diseases such as Brain Tumor, Male Infertility, and Ear Hearing Impairment, effect on the fetus, Alzheimer's disease, Parkinson's

disease, asthma, Heart trouble, high blood pressure, leukemia, birth defects, Immune system, and rheumatoid arthritis. Radiations are also causes of some symptoms which are: headache, sleep disruption, tiredness, and so on DNA damage can also happen because the wireless radiation which given off by the mobile phone devices during the sending and receiving process of the data which is broken down by this research.

II. DISEASE INTRODUCTION

2.1 Brain tumor:

Whether exposure to RF or microwave radiation from mobile phones is associated with a risk of cancer. Priority is given to epidemiological studies of the relationship between the use of mobile phones and the incidence of

- Brain tumors
- Salivary gland tumors, acoustic neuromas and other head and neck tumors, and
- Leukemia and lymphomas.

If the risk of developing a brain tumor exists at all, the wider use of mobile phones and the expected number of people who will develop a brain tumor will be sufficient to detect a potential 1.5-fold increase in risk 5 to 10 years from the start of use. Participant countries, with the longest and highest use of mobile phones, are Australia, Canada, Denmark, Finland, France, Germany, Israel, Italy, Japan, New Zealand, Norway, Sweden and the United Kingdom. Initially, the study expected to find about 6000 cases of glioma and meningoma (both benign and malignant), 1000 cases of acoustic neuroma, 600 cases of parotid gland tumor and their respective controls. The first results of the cellphone Study were available in 2004 and, It should also be noted that these studies evaluated the impact on health of exposure to RF and microwave

radiation emitted by mobile phones, and not by antennas and base stations. With regard to brain tumors, most of the studies yielded negative results, although a few of them suggested an increased risk for mobile phone users. Because of these results, it is not possible to establish an association between the use of mobile phones and an increased risk of brain tumors. With regard to acoustic neuroma – a rare, benign tumor on the auditory nerve the studies available reported inconsistent results, except for the most recent ones, which found an association between an increase in the risk of this type of tumor and 10 years or more of mobile phone use; moreover, No indications of an increased risk for less than 10 years of mobile phone use were found. One is that long-time users first used analogue phones, and then digital phones. No risk has been found for digital phone use only, but then the follow-up time is shorter. A number of clinical complaints related to the use of mobile phones are reported in the scientific literature. They include headache, fatigue, sleep disorders, loss of memory, dizziness, and feelings of heat or tingling in the auricular (or auditory) area or in the head, vertigo, deafness and blurred vision.

2.2 Male infertility:

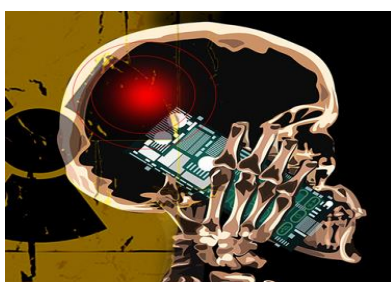
Basically the infertility is a wider problem in the universe due to different causes. Infertility defined as inability to conceive after a year of sexual intercourse without the use of contraceptives. Men usually carry mobile phones in their pockets or in holders close to their reproductive organs. Thus, it is important to evaluate the effects of mobile phone use on male fertility. Although, many recent epidemiological studies have suggested that mobile phone use may play a role in male infertility, but the mode of action on the male reproductive system remains unclear. Mobile phones might influence the reproductive system via EMW thermal and non-thermal effects and they may interfere with normal spermatogenesis and result in a significant decrease in sperm quality

2.3 Ear hearing function:

The scientific literature includes studies where people or animals were exposed to RF radiation for relatively short periods of time and the effect on the auditory system was assessed using various hearing tests. There are also observational epidemiological studies that investigated the possible association between RF radiation exposure and hearing impairment. cellphones are mostly located next to the head during a call - specifically next to the ear - and the auditory system absorbs the radiation emitted by them, the possibility that exposure to cellphones might cause auditory system impairment or development of tinnitus (a phenomenon where “ringing in the ears” is experienced in the absence of external auditory stimulus) has been investigated. Problems affecting some of the studies we recommend acting according to the precautionary principle and minimizing exposure of the ear to RF radiation emitted from cellphones. The most efficient way of minimizing exposure is distancing the phone from the head.

3.0 Cell Tower Radiation and Its Impact on Humans and the Environment:

The increased use of smartphones has raised public interest in possible health issues associated with exposure to electromagnetic energy. People are concerned about exposure from Smartphone handsets & cell tower base stations. Radio signals are part of everyday life, emitted both by natural sources like the sun, the Earth and the ionosphere, and by artificial sources such as: 4G cell tower base stations, broadcast towers, radar facilities, remote controls, medical, electrical and electronic equipment. The radio frequency sources include transmitting towers such as AM, FM radio towers, TV towers; Cell phone towers, etc. emit radio frequency or microwave radiation continuously. The level of EMF from sources has risen exponentially, by soaring popularity of wireless technology such as smartphones, cordless phones, Wi-Fi (Wireless Internet) Wi-max and other wireless devices.

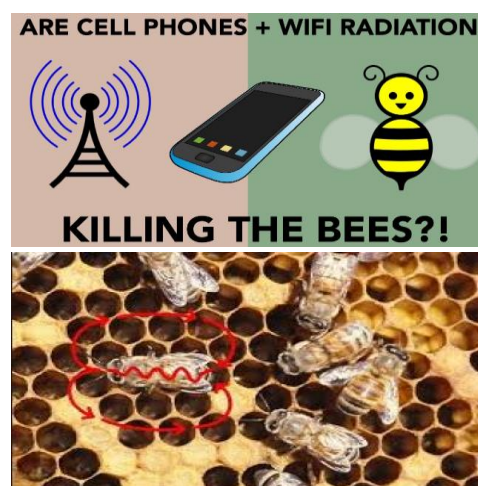


3.1 Cell Phone Tower Radiation: Impact on Agriculture and Environment:

The impact of the invisible negative impact on agriculture and biodiversity has long been affecting the environment. Scientists are also doing research. For the unknown reasons everyone is responsible for the radiation effects of mobile towers. Here is some of the information on mobile phone tower research. There have been 926 studies across the world on radiation of mobile phone towers. Of these, 601 studies have shown negative impact on animals, birds, insects, microbes and humans. The 1900 MHz microwave spreads between one square kilometer of the mobile phone tower. Electron Magnetic Radiation (EMR) emitted from the mobile phone tower is very dangerous. It is harmful to biological systems of animals, insects, plants and humans in different ways.

3.2 Impact on bees, ants and birds:

Impact of pollen-assisted insects is also increasing. If these insects are extinct, the plant will stop the pollination and the plant will be dissolved, the food production will stop. Scientist Einstein said, people will be wiped within four years of bee destruction. Bee causes pollination of about 100 crops. 30-40% yields increase in bee pollination. A US study showed that bees have been declining in the last few years. Evidence shows that due to the increase in the Intensity-Modulated Radiation (IMR), it is decreasing. The insects and animals that are infected with the bees and the animals through the sign of the bees are damaged by the IMR. Also, mobile phones with high magnetic fields may change the living organisms in some parts of the brain. This obstructs the bees to return to the beeswax. A recent survey in India found that in the state of Kerala, due to the effect of Electron Magnetic Radiation (EMR), the production of honey from commercially bees decreased severely. A study on the ants showed that in an EMR's effect is to reduce the habit of abandoning the house and place of sparrows, doves, storks, gooseberries and different species of birds.



3.3 Impact on the plants:

EMR has a negative effect on plant plants such as forest trees, fruit trees, and crop plants. There is evidence that the yield on the mobile phone tower was low. If there is a tower near a tall tree with

coconut trees, the production is hampered. The IMR has been blamed as a reason for the decline in the forest in Germany. Lower frequency radio frequency radiation also damages the trees.

III. CONCLUSION

The potential health effects cannot be restricted to mobile phone base station frequency bands alone. It can also be attributed to exposure due to other sources of radiofrequency Electromagnetic radiations in daily life such as mobile phones, cordless phones, and wireless local area networks. The evidence available does not provide a clear pattern to support an association between exposure to RF and microwave radiation from mobile phones and direct effects on health (such as increasing the risk of cancer). However, the quality of this research and the relatively short-term data do not allow ruling out adverse effects on health completely. In other words, the absence of evidence of detrimental effects on health associated with mobile phone use is not evidence of absence of such effects. At the moment, it is impossible to state that exposure to RF or microwave radiation (even below the permitted levels) does not have adverse effects on the health of the general population. The current evidence, however, does suggest that if there is a risk, it is small. Therefore, a precautionary approach to the use of this communication technology should be adopted until more scientific. Like as Wi-Fi Routers -Boosters should be placed at a distance. Switch off the Data Pack on mobile and Wi-Fi when not in use. While sleeping keep all the cordless devices at a safe distance from you. Communicate through SMS as an alternate to calling. Use Wired Headsets for long conversations. Mobile Phones having 'SAR' value less than 1.6W/kg should be bought. Keep distance Hold the cell phone away from body to the extent possible.

IV. REFERENCES

- [1]. Oni OM, Amuda DB, Gilbert CE (2011) Effects of radiofrequency radiation from Wi-Fi devices on human ejaculated semen. *Int J Res Rev Appl Sci*
- [2]. Sage C, Carpenter DO (2009) Public health implications of wireless technologies. *Pathophysiology* 16: 233-246
- [3]. Dohle GR (2010) Male infertility in cancer patients: review of the literature. *Int J Urol.*
- [4]. Hamada A, Singh A, Agarwal A (2011) Cell Phones and their Impact on Male Fertility: Fact or Fiction. *The Open Reprod Sci J* 5: 125-137.
- [5]. Kellenyi L, Thuroczy GY, Faludy B, Lenard L (1999) Effects of mobile GSM radiotelephone exposure on the auditory brainstem response (ABR). *Neurobiology*.
- [6]. Vasudev A, Kaur M, Kumar H, Chaturvedi R (2012) Mobile Phone Usage and Awareness of Health Related Issues Among the Male Science Students. *Stud Sociol Sci* 3: 62-67.
- [7]. Geneva, Switzerland: World Health Organization; 2010-2011. International EMF Project Progress Report;
- [8]. Hermann DA, Hossmann KA. Neurological effects of microwave exposure related to mobile communication. *J Neurol Sci*. 1997
- [9]. National Radiological Protection Board. Mobile phones and health 2004: report by the Board of NRPB. Chilton, Didot, Oxford shire, National Radiological Protection Board, 2004 (Documents of the NRPB, volume 15

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