International Journal of Science and Research (IJSR)
ISSN: 2319-7064
SJIF (2022): 7.942

Possible Health Hazard of 5G BDMA/MIMO Radiation

Anurag Misra

Associate Professor, Department of Physics DBS College Kanpur CSJM University

Abstract: ***Wireless technologies can be regarded as back bone of modern development. Electromagnetic radiation has been the topic of debate for some time. Controversy continues with regards to harm from current 2G, 3G, and 4G wireless technologies. 5G technologies are far less studied for human or environmental effects. It is argued that the addition of this added high-frequency 5Gradiation to an already complex mix of lower frequencies, will contribute to a negative public health outcome both from both physical and mental health perspectives. In 5G, the Base station adopts MIMO (massive input /massive output) and beam forming techniques, which have also been considered in 4G networks. However, there are two substantial differences compared to previous networks, i.e., higher maximum output power and dynamic pencil beam forming with a larger number of antenna elements. The maximum transmitted power by a 5G BS can reach up to 200 W, almost double the corresponding value for a 4G base station. This research discus, possible harmful effect of 5G radiation.***

Keywords: radiation, 5g, BDMA, hydrophobic, UVB

1. Introduction

5G communication is based on Beam Division Multiple Access (BDMA) different technology than its earlier versions namely 1G, 2G, 3G and 4G in which Time division multiple access (TDMA) and Code division multiple access (CDMA)were used the use of mobile wireless technologies continues to increase worldwide. A new faster 5th generation (5G) telecommunication system has recently been approved by the Federal Communications Commission (FCC) with new antennas which are already installed. While it may give us uber automation and instantaneous "immersive entertainment" a lot of questions remain with regards to public health and safety of wireless devices. 5Gwill include the higher millimetre wave frequencies never before used for internet and communications technology. The 5G transmission uses frequencies in the microwave spectrum in the low- (0.6 GHz – 3.7 GHz), mid- (3.7GHz – 24 GHz), and high-band frequencies (24 GHz and higher) for faster communications. These higher frequencies cannot travel far and obstructed by manmade constructions especially in major cities and populated areas, to overcome this situation dense network of transmission is installed This radiation, like the 2G, 3G, 4G telecommunications systems, has not been testing for long term health effects despite the fact that people will be exposed continuously to these radiations continuously .

Effect on Eyes

There is a particular concern for 5G applications on eyes as eyes would also receive significant radiation especially for near field exposures. Well established risk factors in the development of cataracts are age, smoking, diabetes, and UVB exposure. Natural UVB radiation makes up only 5% of the UV rays from the sun, but it is very high energy. UVB damages skin cells and causes DNA mutations that can eventually lead to melanoma and other types of skin cancer. Research is pointing towards oxidative damage as a general mechanism for age-related cataracts. Well established risk factors in the development of cataracts are age, smoking, diabetes, and UVB exposure. Research is pointing towards oxidative damage as a general mechanism for cataracts. Our metabolic activity is designed to take care of natural rise in temperature and blood circulation acts like a coolant and normalise the temperature of various human organs. The eyes lack sufficient blood flow to dissipate heat effectively. There is some evidence that repeated low-level exposures to microwave radiation could cause formation of cataracts further study and research is needed.

Cell membrane effect

Cell membrane's hydrophobic nature, small electrically neutral molecules pass through the membrane more easily than charged, large ones. The inability of charged molecules to pass through the cell membrane results in pH partition of substances throughout the fluid compartments of the body. Cell membrane provides protection for cell and provides fixed environment to cell the membrane has several important functions one of them is to provide nutrients to cell and to flush out toxins. Damage to cell membrane disturbs the state of cell electrolytes substantial, inducing a number of biological changes, even at non thermal levels, including cell membrane effects. Short term application of certain frequencies stimulates a release of endogenous opioids in the skin..Researchers have proposed the sweat glands as a target. The sweat ducts in human skin are helically shaped tubes, filled with a conductive aqueous solution. Their research indicates that sweat ducts in the skin could behave as antennas and thus respond to millimetre waves.

Carcinogenic nature

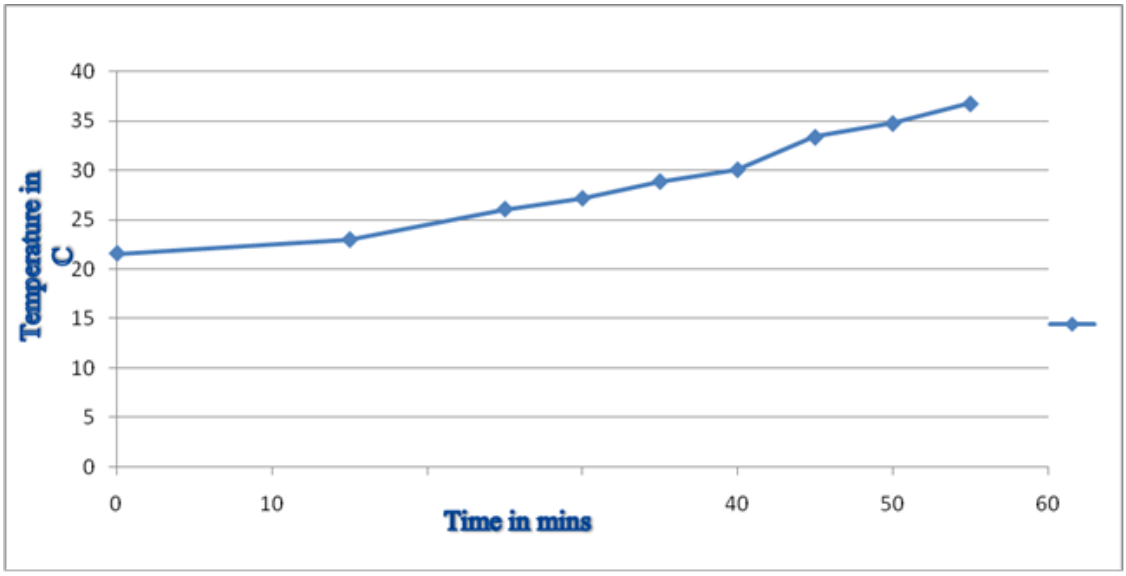
5G high frequency spectrum can lead to faster cell division mutation of cells and induces tumours which might later become cancer. Continuous exposure to the 5G radiation may increases the production of Reactive oxygen species (ROS) with potential to cause cellular damage, damage to proteins, lipid RNA and DNA which otherwise is a normal part of cellular processes and cell signalling. Overproduction of ROS due to continuous exposure has to be studied

Thermal effects

When EM radiation is absorbed, it is converted into heat. A readily understandable mechanism of the effect of radiation

is tissue heating (thermal effect). Biological systems alter their functions as a result of a change in temperature. When electromagnetic radiation is incident on the matter, it causes the charged particles to oscillate and gain energy. The ultimate fate of this energy depends on the situation. It could be immediately re-radiated and appear as scattered, reflected, or transmitted radiation. It may also get dissipated into other microscopic motions within the matter, coming to thermal equilibrium and manifesting itself as thermal energy in the material. Intense microwaves waves can thermally burn living tissue by agitation of water molecules and can cook food. Ionizing electromagnetic radiation can create high-speed electrons in a material and break chemical bonds, but after these electrons collide many times with other atoms in the material eventually most of the energy gets downgraded to thermal energy, this whole process happening in a tiny fraction of a second. Communication waves come under non ionising category but even then it is observed that there is rise in temperature when exposed to mobile tower and cell phone.

Observations shown below explain the effect .The experiment was conducted in department with the help of volunteers and was part of major research project.



2. Conclusion

There are reports by operators and researchers funded by operators for support of one sided version of wireless communication especially 5G off course it is very useful not only for mobile phones but also developing area of AI .It is very important that certain hazard related areas and concerns need to be further investigated as these effects may take decades to show irreversible damage to living bodies

References

[1] Harmful effects of 5G radiations: review: review, Verma et.al .Volume-7, Issue-3, Mar.-2019, http://ijieee.org.in
[2] Bernier, R.H., 2017. What constitutes a public health problem? Epimonitor (AccessedSept30, 2017).⟨http://epimonitor.net/List_of_Public_Health_Issues.htm⟩.
[3] "High frequency radiation pollution hazard due to cell phone and towers in India" , 9th Asian Symposium on Visualization 2007, Anurag Misra, Presented ,The Hong Kong University of Science and Technology ,Hong Kong
[4] Measurement of Electromagnetic Radiation Around Mobile Tower Base Station and Possible Hazard on Human Population, Proceedings of Dynamic Systems and Applications Atlanta USA 6 (2012) 270-273