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Health Hazard of Mobile Phone Wave in Iraq

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Abstract:

Determine the full impact of the waves that mobile phones emit by conducting experiments with a research team. where it is acknowledged that the distance between a cell phone and the electrical energies that enter the body can affect the body's organs. Understanding how it affects the rate of particular absorption is also important. not to mention figuring out the temperature shift. The range of distances between a mobile phone and the organs of a human body is 1 to 15 cm. exposure to various 900, 800, 1800, and 1450 MHz wave intensities.

Introduction

When the first mobile phones were introduced in 1980, communications were still not activated at home and were not connected to the phone per se. However, with the development of a truly intelligent invention, we do not refer here to the phone but rather to the cellular network that supported it, the environmental threat posed by mobile phone waves regarding radiation that causes pollution and diseases in the environment in general and for humans in particular, began to take serious form. The phone uses an electrical signal to convert sound into radio waves, which are then converted back into the sound that can be heard on the phone. Mobile phones are wireless devices that work in tandem with wireless receivers; they are very similar to radios in that they require built-in antennas to maintain communication. This means that mobile phones can only transmit signals over very short distances, much like wireless communication devices. The signal is then picked up by the cell phone's network station once it gets to the closest station. These massive phone antennas pick up the weak signal from the phone and follow it until it reaches another phone by reaching the nearby station for the other phone so that this step takes place during the conversation and goes without interrupting your call. Cellular network stations work to divide the land or regions in the form of a hexagon formed from the lands as a private phone station, also known as the base station. On mobile networks, there is a finite quantity of radio frequencies available. Due to the fact that a mobile phone conversation requires one frequency and one transfer in order to be carried out, it is possible that in crowded areas like city centres, where there is a dense network of phone antennas and a smaller number of stations, the same frequencies may be reused once for up to several conversations on the bandwidth.

This will guarantee that there are enough frequencies for everyone, making it uncommon for frequencies to be unavailable other than during peak usage hours. A mobile unit and a base-station terminal's radio propagation statistical characteristics are determined. Random frequency modulation, level crossing rates, fade durations, correlations of fields against time and space at mobile and base stations, and probability distributions of amplitude and phase are all determined using the power spectrum of the transmission coefficient in the multipath medium. It is demonstrated that the power spectrum and time delay density are dual. The density of time delays then yields the correlations versus frequency and the coherence bandwidth. Next, predictions are made about the performance of standard diversity systems. Results previously published by Clarke are reviewed; however, the derivations provided here use power spectrum expressions instead of component wave formulations. Throughout, the power spectral technique is employed to enable the direct application of earlier statistical analyses, most notably Rice's. (Gans, 1972) . The mean effective gain (MEG) of antennas moving in a mobile communication environment is analysed using the method given. The relationship between the antenna patterns and the statistical distribution of incident waves in an environment determines a mobile antenna's MEG properties. In order to theoretically analyse this relation, a unique statistical model is provided, whose distribution is Gaussian in elevation and uniform in azimuth, and a generic expression for the MEG is produced using a statistical model of incident waves. Empirical parameters for the statistical distribution are presented, and 900-MHz-band measurements conducted in an urban area of Tokyo are used to validate the validity of the statistical model. Moreover, the suggested method is applied to explore the MEG properties of a half-wavelength dipole antenna, and it is demonstrated that the theoretical curves computed using the empirical parameters correspond very well with the experimental data. This technique can be used in a wide range of mobile communication situations to assess the MEG characteristics of any mobile antenna. (Taga, 1990). There are several uses for microwave radiation in various home, medicinal, industrial, and scientific appliances. They have both non-thermal and thermal effects when used in mobile phones, with an operating frequency of roughly 1 GHz. We're interested in conducting some research in this area and looking at the present associated standards and deficiencies because of the widespread and prolonged use of mobile phones by individuals as well as the physiological consequences related to field intensity, frequency, waveform, and exposure time. To identify fair solutions to the current problems in this field and to address the concerns of prosecutors, particularly those who have been protesting against the installation of mobile communication masts, the research actually attempts to analyse relevant findings and current standards. Prioritising protective concerns and norms based on ICNIRP instructions should be a top priority for organisations and linked organs, according to prior studies on scientific findings (Mohammad, 2013). the results of a minute-long cell phone exposure to the human body. EEG signals are used to monitor brain activity. Both before and during phone calls, the EEG waveform is recorded. This study examines the distance band used to determine a mobile phone's position. The range of the distance is 1.8 to 2.2 inches. Here, we also examined temperature variations between 0.36 and 0.71 degrees Celsius for frequencies ranging from 0.9 to 1.8 GHz. We also noted the impact of penetration length, which varied from 0.1 to 1 centimetres. It is emphasised that the impact of frequency variation is lessened when we use a mobile phone in a specific distance band. Bhangari, D. S. et al., 2019 TV, FM, and AM broadcasting stations are examples of microwave mobile communication systems. These stations require a lot of power to send messages across longer distances. Most industrialised nations in the globe that require more connectivity use WiFi and WiMAX.

data speeds. The operating frequencies of these two communication systems are in the higher end of the spectrum, at several multiples of GHz.

microwave range. Both thermal and non-thermal effects are brought on by the microwave frequencies utilised in cellular communication.

When compared to thermal effects, non-thermal effects cause a great deal more damage. The radiations from electromagnetic fields are acknowledged as the primary cause of cancer as well.

The cell structure is impacted by the EMR that the base station's mobile antennas emit.

among the organisms. Additionally, users' mobile devices are rated according to their specific absorption rate (SAR), which is a gauge of the power that The radiation that a human body gets from a mobile device should be at a safe level. Every broadcast mentioned above and communication technologies are also accountable for the majority of the dramatic changes to wireless systems. terrible consequences for living things. the technologies for wireless communication and anticipated countermeasures. Radio frequency fields have international rules and exposure limits. An hour is required to comprehend the health risks associated with radiofrequency radiation and to put the recommendations into practice (Sukhdeep Kaur et al,2016).

One of the sectors in modern history that has grown the fastest is the mobile phone business. Numerous studies have demonstrated the negative effects electromagnetic radiation from cell phones and phone towers has on human, animal, and plant health. The user's time determines the impact of electromagnetic radiation released by mobile phones and mobile phone towers. The continued usage of mobile phones has increased the risks to one's health. The purpose of this study is to educate those who are unaware of these radiations. According to this study, residents who live close to mobile phone towers may be harmed by the electromagnetic radiation these towers release. As a result, residents should avoid the towers and use their phones as quickly as possible during low-light conditions. (Mushtaq & Associates, 2013A). The human body was subjected to the transmitted waves from these mobile phones, and as a result, the field inside the body decreased dramatically with depth. Since the absorption of power was the cause of the field reduction, the World Health Organisation (WHO) and the International Commission on Non-ionizing Radiation Protection (ICNIRP) permitted limit was compared to the particular absorption rate that was computed. At frequencies of 800, 900, 1800, and 2450 MHz, and with an effective radiated power of 2 Watts, it was discovered that the specific absorption rate values were above the limit at distances ranging from 1 to 15 cm from the body (V. Kumaret al., 2010). Mobile phone waves' effects on bone cells and skeletal muscles assessed hypothetically. The phonon is produced when electromagnetic wave photons (EMW) are scattered by various tissues. This mechanism raises the temperature of the tissue and transfers energy between the tissues. The effect of energy absorption is investigated and the amount of energy absorbed has been estimated. The induced electric field inside the body diminishes dramatically with depth when mobile phone electromagnetic fields (EMFs) are penetrated. Since the absorption of power is the cause of the field reduction, the specific absorption rate (SAR) is computed and compared to the allowable limit specified by the World Health Organisation (WHO), the International Commission on Nonionizing Radiation Protection (ICNIRP), and other organisations. According to SAR estimations for various organs, radiation at frequencies of 800MHz, 900MHz, 1800MHz, and 2450MHz is detrimental at distances of 10 cm, 11 cm, 12 cm, and 14 cm from a mobile phone hand set, respectively (Kumar1 et al, 2012). Analyse the radiations from the Global System for Mobile Telecommunications (GSM) 900 and 1800 with respect to radiation-field intensities or distances from the antenna. Materials and procedures: Drosophila melanogaster adult insects were exposed to the radiation of a GSM 900/1800 mobile phone antenna at various distances ranging from 0 to 100 cm. The effect of these radiations/fields on the insects' ability to reproduce as well as the induction of cell death in the gonads was examined using the TUNEL (Terminal deoxynucleotide transferase dUTP Nick End Labelling) assay. With increasing distance and falling intensities, the effect was lessened. In comparison to smaller or longer distances, an increased bioactivity "window" was seen about 20–30 cm from the mobile phone antenna (radiation intensity of 10 mW/cm2), where the effect became maximum. At distances greater than 40–50 cm, the effect became significantly less pronounced, and at radiation intensities less than 1 mW/cm2, it vanished completely. Conclusions: According to DIMITRIS et al. (2009), GSM bioactivity is highest at intensities of less than 10 mW/cm2 and remains noticeable up to 1 mW/cm2 with "window" effects. The internet, high-definition photos, news, and voice interactions are just a few of the many uses for cell phone technology that permeate daily life. The exponential rise in mobile phone usage in recent times has raised concerns in society over the electromagnetic radiation that these devices create. When a mobile phone is positioned close to the ear or skull, it emits electromagnetic radiation known as the "thermal effect." Body tissue heats up at a set rate as a result of an electromagnetic field being transferred to the body and creating a thermal effect. The sort of phone being used and the amount of time it is utilised will determine how this effect changes. This study examined the effects of the heat distribution a handheld mobile phone produces towards the human head by gathering data from a thermal imaging camera. The analysis is carried out in an anechoic chamber with two distinct mobile phone kinds, internal and external antennas servicing separate radio frequency ranges, 900 MHz and 1800 MHz, and an average talking hour of 45 minutes. After 45 minutes after surgery, the results revealed an increase in heat, particularly in the area next to the ear skull. When comparing the two distinct phone kinds, the outside oriented phone produces more heat than the internally oriented phone. In 2013, Mushtaq and Vijay. The change in temperature of human skin, blood, muscle, and bone tissues operating at frequencies of 800, 900, 1800, and 2450 MHz is estimated mathematically. The mobile phone antenna has a 2 W power output. The varying distances of the human body from the mobile phone are used to calculate the various depths. The penetration depth within the bodily tissues ranges from 0.1 to 0.5 mm. The body's thermoregulation mechanism can regulate body temperature, but only to a certain degree. Analysis is also done on the variation in temperature change in particular tissues after exposure for 15, 30, 45, and 60 minutes. 2015; Mushtaq and Vijay. Radiofrequency (RF) exposure and human health are long-standing concerns. The benefits and happiness gained from using a GSM cell phone are being frightened by allegations that radiation from this technology has harmful impacts on human health. This radiation is classified as nonionizing radiation, the safety of which to human health is still up for debate. No studies have been done to investigate the potential health effects of this gadget, and there is no experimental evidence to support any claims made based on data collected in India. Although there are safety regulations for cell phone radiation, they are unsettling. This study looks into potential effects of mobile phone radiation on heart rate in humans and draws conclusions based on empirical evidence. The pulse rates of more than forty human subjects—20 males and 20 females—were tracked using three exposure criteria. The phone was placed in vibration mode during one of the radiation tests to be sure the subjects weren't only reacting to vibration. It was discovered that individuals' pulse rates did not vary noticeably when exposed to phone radiation. Though it was just slightly more than 1%, the percentage decline reported by individuals 40 years of age and older makes it advised that those 40 years of age and above stay away from keeping cell phones near to the body. [Mushtaq and others, 2013 B]

2. Methodology

Since the mobile phone entered our lives in the new millennium, concerns have grown about its bad effects. But what are the real health risks of using cell phones, and what are the negative consequences of radiation emitting on human community. May be listed as below;

1. **Mobile Phone Wave.**
2. **Specific Absorption Rate (SAR) of Mobile Phone Waves**
3. **Temperature of Different Tissues of Human Being.**

All of these effects may be present by researchers which indicated below.

3. Result and discussion

The results of the researchers are presented in the study of the effect of the cellular phone distance from the human body in its different composition with **penetrated electric field by** different waves of intensity. Where the distance between 1 cm and 15 cm was adopted.

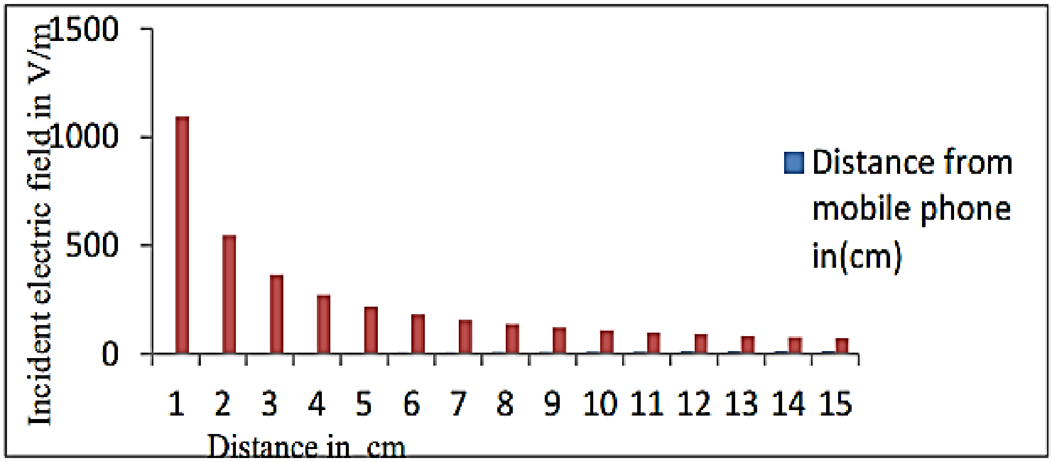

Figure (3.1)

The computed electric field around the mobile phone hand set at distance 1 cm to 15 cm from the human body As shown in the Figure (3.1) .(MUSHTAQ AHMED BHAT , 2016)

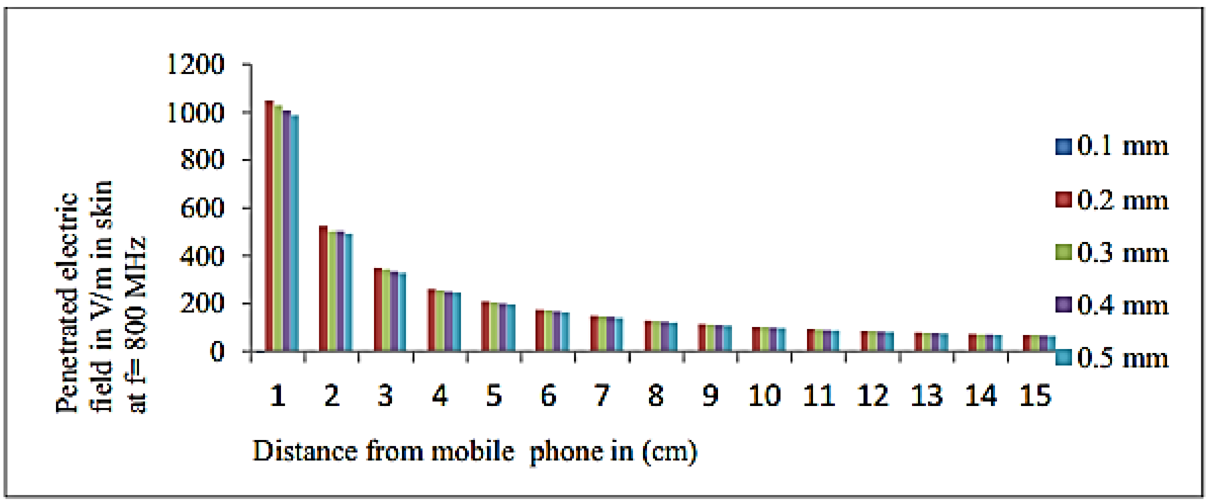

Figure (3.2)

The variation of penetrated electric field inside the skin with depth of 0.1 , 0.2, 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 800 MHz , As shown in the Figure (3.2).(MUSHTAQ AHMED BHAT , 2016)

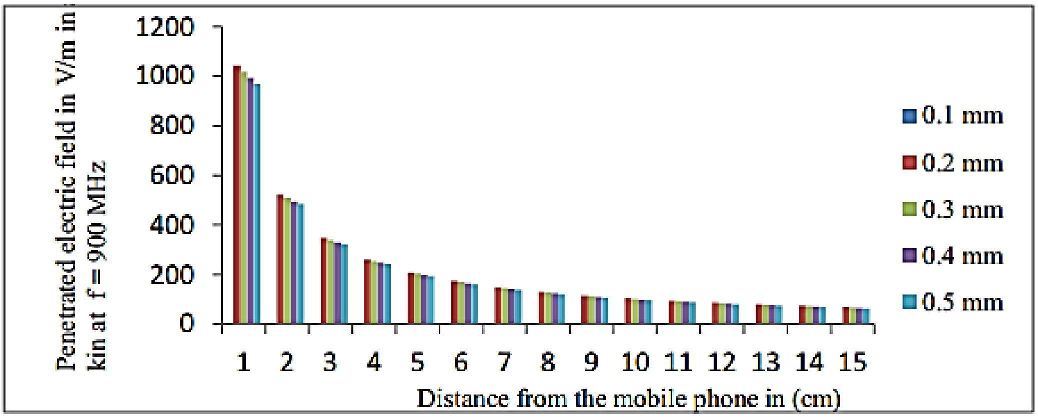

Figure (3.3)

The variation of penetrated electric field inside the skin with depth of 0.1, 0.2, 0.3, 0.4 and 0.5 mm from mobile phone at frequency 900 MHz , As shown in the Figure (3.3) **.**(MUSHTAQ AHMED BHAT , 2016)

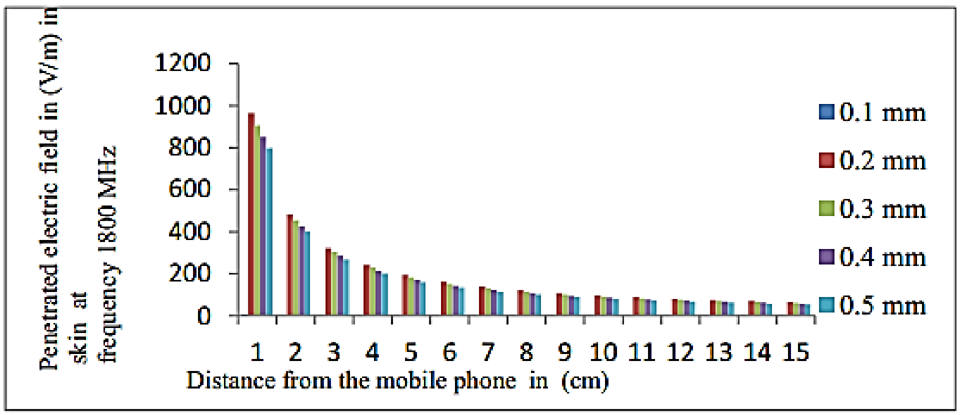

Figure (3.4)

The variation of penetrated electric field inside the skin with depth of 0.1 , 0.2 , 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 1800 MHz . As shown in the Figure (3.4). (MUSHTAQ AHMED BHAT , 2016)

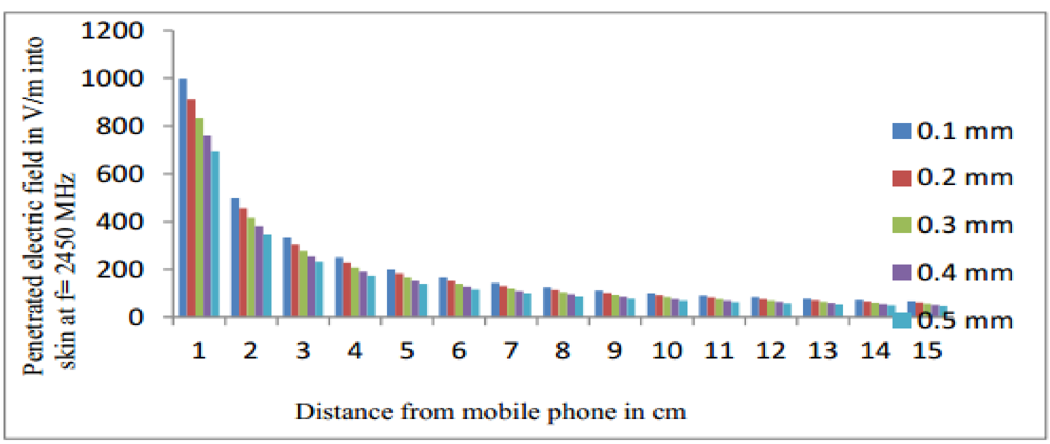

Figure (3.5)

The variation of penetrated electric field inside the skin with depth of 0.1, 0.2, 0.3, 0.4 and 0.5 mm from mobile phone at frequency 2450 MHz. As shown in the Figure (3.5). (MUSHTAQ AHMED BHAT , 2016)

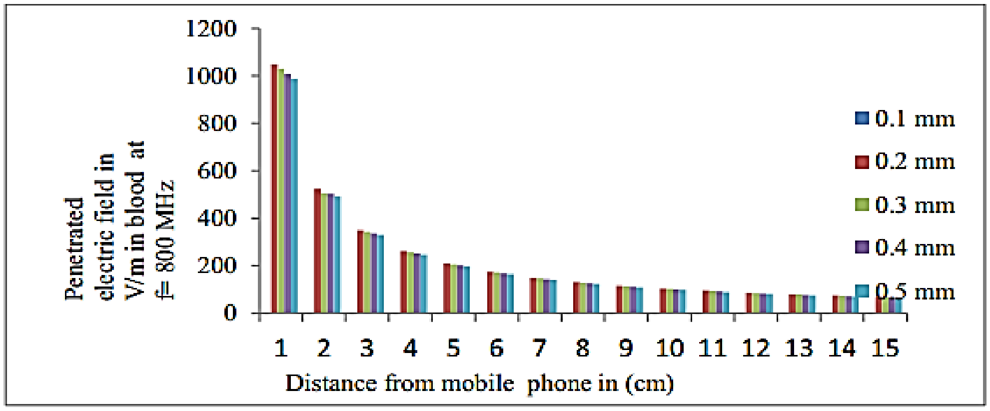

Figure (3.6)

The variation of penetrated electric field inside the blood with depth of 0.1, 0.2, 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 800 MHz, As shown in the Figure (3.6). (MUSHTAQ AHMED BHAT , 2016)

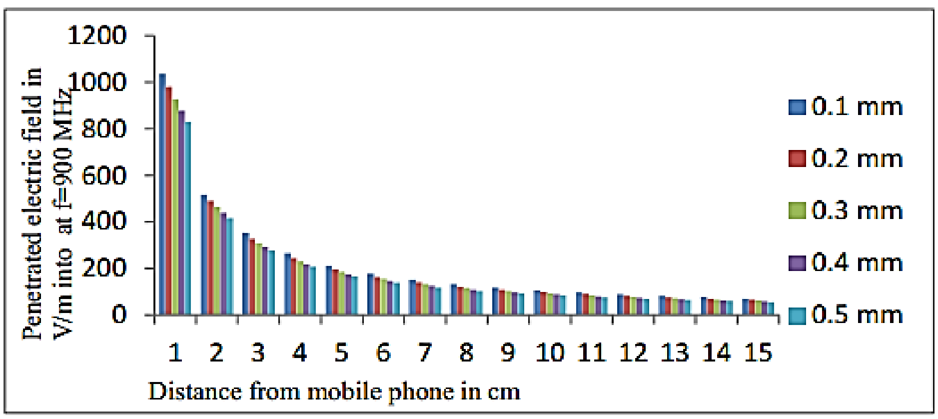

Figure (3.7)

The variation of penetrated electric field inside the blood with depth of 0.1 , 0.2, 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 900 MHz. As shown in the Figure (3.7)**.** (MUSHTAQ AHMED BHAT , 2016)

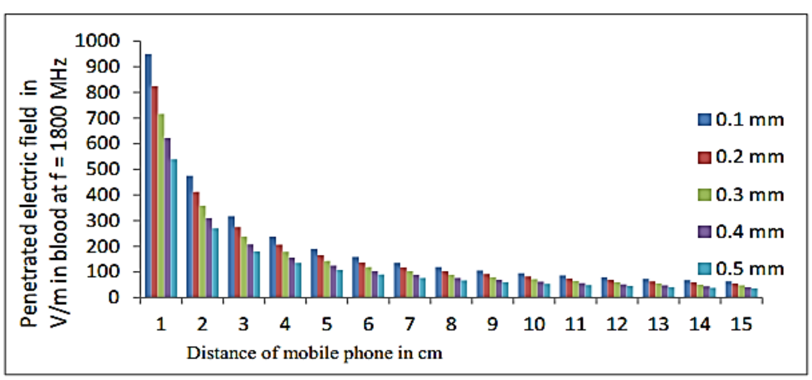

Figure (3.8)

The variation of penetrated electric field inside the blood with depth of 0.1, 0.2, 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 1800 MHz . As shown in the Figure (3.8)**.** (MUSHTAQ AHMED BHAT , 2016)

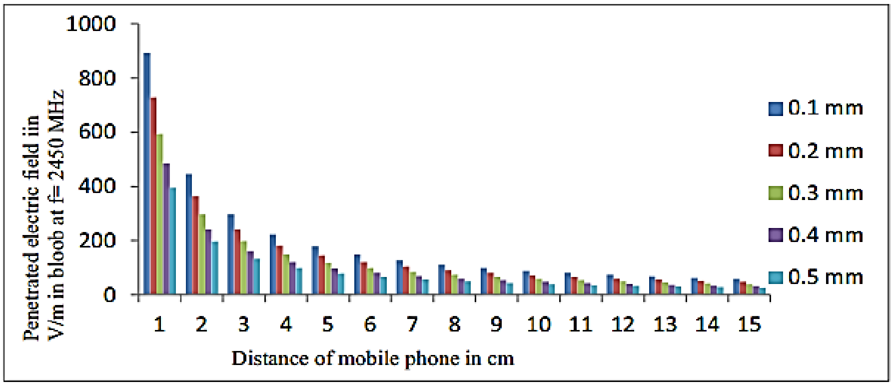

Figure (3.9)

The variation of penetrated electric field inside the blood with depth of 0.1, 0.2 , 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 2450 MHz As shown in the Figure (3.9). (MUSHTAQ AHMED BHAT , 2016)

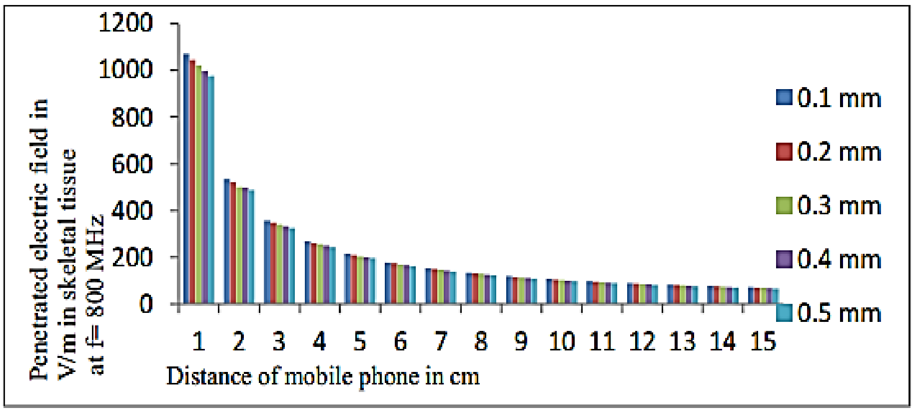

Figure (3.10)

The variation of penetrated electric field inside the skeletal muscles tissues with depth of 0.1 , 0.2 , 0.3 , 0.4 and 0.5 mm from mobile phone at frequency 800 MHz . As shown in the Figure (3.10). (MUSHTAQ AHMED BHAT , 2016)

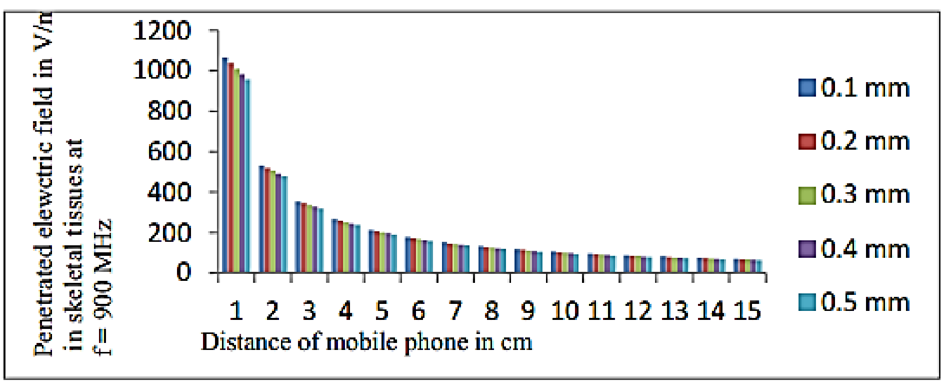

Figure (3.11)

The variation of penetrated electric field inside the skeletal muscles tissues with depth of 0.1, 0.2, 0.3, 0.4 and 0.5 mm from mobile phone at frequency 900 MHz . As shown in the Figure (3.11). (MUSHTAQ AHMED BHAT , 2016)

Conclusion

The Comparison between the results for authors below may be listed; Penetrated electric field at 1 cm distance from phone is higher than others at 800, 900 and 1800 and 2450 MHz. Penetrated electric field at 1 cm distance from phone is higher than others at 800 and 900 MHz from at 0.1 mm to 0.5 mm inside the blood Penetrated electric field at 1 cm distance from phone is highethan others at 1800 MHz especially at 0.1 mm and 0.2 mm inside the blood . Penetrated electric field at 1 cm distance from phone is higher than others at 2450 MHz at 0.1 mm inside the blood ..

Recommendation

1. Avoid carrying the device adjacent to the body.
2. Reduce the duration of the call.
3. Use the mobile phone with distance more than 1 cm to head.
4. Use the device's headphones to reduce the risks of exposure to waves.
5. While the phone is ringing, do not bring it close to your ear or head.

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